

# Operation Manual

## road construction spreaders

### **AMAZONE** **ZA-XS**



MG 808

DB 542.1 (D) 12.01

Printed in Germany



Before starting work,  
please carefully read  
and adhere to this op-  
eration manual and  
safety advice.



## Preface

Dear Customer,

The road construction spreaders ZA-XS are machines from the comprehensive range of products of AMAZONEN-WERKE, H. Dreyer GmbH & Co. KG.

To make full use of your newly purchased machine, please carefully read and adhere to this operation manual before starting to operate with your machine.

Please ensure that all operators read this operation manual before they start to operate with the machine.

This operation manual applies for all road service spreaders of the series ZA-XS.

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## 1. Details about the machine

### 1.1 Range of application

The spreader for road construction **AMAZONE ZA-XS** is suited for spreading grit, sand, salt and mixtures.

### 1.2 Manufacturer

**AMAZONEN-WERKE**

H. DREYER GmbH & Co. KG

P. O. Box 51, D-49202 Hasbergen-Gaste/Germany

### 1.3 Conformity declaration

The machine fulfils the requirements of the EC-guide line Machine 89/392/EC and the corresponding additional guide lines.

### 1.4 On requesting after sales service and parts

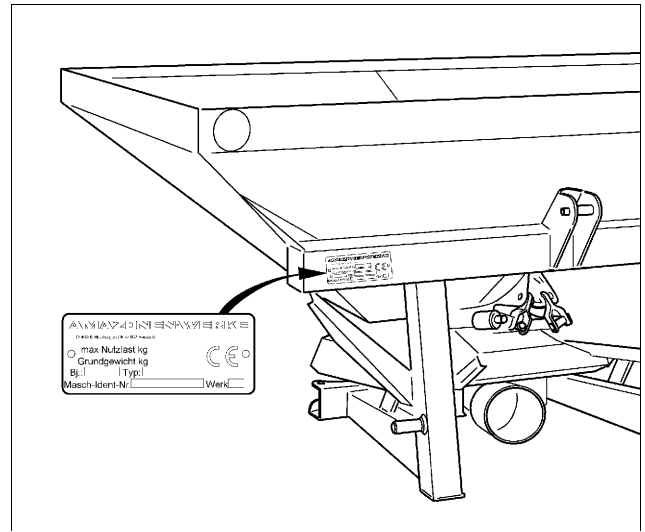
When ordering options or spare parts, the machine model and the serial number have to be quoted.



The safety technical requirements are only fulfilled if, in case of repair **AMAZONE** original spare parts are used. Using non-original spare parts will rule out the liability of **AMAZONE** for resulting damage.

## 1.5 Type plate

Type plate on the machine.



The entire type plate is of documentary value and should not be damaged or removed.



## 1.6 Technical data

Type	Hopper capacity	Payload	Net weight	Filling height	Filling width	Total length	Total height	Total width
	[l]	[kg]	[kg]	[m]	[m]	[m]	[m]	[m]
<b>ZA-XS 602</b>	600	1800	198	0, 91	1, 40	1, 23	0, 93	1, 50

### 1.6.1 Operational data

Operational rev. speed of PTO shaft: **540 min<sup>-1</sup>**.

(Please observe the advice in the setting chart).

Max. operational hydraulic pressure: **230 bar**.

### 1.6.2 Hydraulic connections

**Required depending on execution:**

- Hydraulic shutter control "I"
  - 1 single acting spool valve.
- Hydraulic shutter control "II"
  - 1 double acting spool valve.
- Hydraulic combi lever "I"
  - 2 single acting spool valves.
- Hydraulic spreading disc drive (ZA-XS H) (only for road construction)
  - 1 single acting spool valve and one pressure free return flow

### 1.6.3 PTO shaft drive

At a PTO shaft rev. speed of **540 min<sup>-1</sup>** the spreading disc rev. speed is approx. **400 min<sup>-1</sup>**.

### 1.6.4 Hydraulic connections

- Hydraulic motor 100 cm<sup>3</sup>

Required pump capacity of the pulling vehicle

- min. 35 l/min.
- max. 50 l/min..

- **Hydraulic motor 80 cm<sup>3</sup>**

Required pump capacity of the pulling vehicle

- min. 25 l/min.
- max. 45 l/min.

The indicated required pump capacity of the relevant pumps results in a spreading disc re. speed of min. **250 min<sup>-1</sup>** to max. **400 min<sup>-1</sup>**.



**If the available pump capacity for the relevant pump is within the upper range, operate with a reduced engine nominal rev. speed of the pulling vehicle and thus with a reduced pump drive capacity. This measure results in less wear on agitators and hopper bottom, especially when spreading grit.**

### 1.6.5 Details about noise level

The tractor operator seat related emission value is 74 dB (A), measured when operating with shut tractor cab at the ear of the tractor operator.

Measuring device: OPTAC SLM 5.

The emission value depends on type of vehicle used.

## 1.7 Designated use of the machine

The designated use for the road construction spreader **AMAZONE ZA-XS** is for exclusive use only:

- for spreading grit and sand on to the base layers.
- for spreading grit on to the upper asphalt base and wearing layer.

Any use beyond these guidelines stipulated above is no longer considered as designated use. The manufacturer does not accept any responsibility for damage resulting from non-compliance and therefore the operator himself carries the full risk.

Under "designated use" also the manufacturer's prescribed operation, maintenance and repair conditions must be adhered to as well as the exclusive use of **original AMAZONE spare parts**.



**Any damage resulting from arbitrary changes on the machine rule out the responsibility of the manufacturer.**

Though machines having been manufactured with great care certain deviations cannot totally be excluded even at a designated use. These deviations may be caused e.g. by:

- Varying composition of the spreading material (e.g. granule size distribution, specific density, granule shape).
- Blocking up or bridging (e.g. by foreign particles or moisture).
- Wear of wearing parts (e.g. spreading vanes, agitator . . . ) .
- Damage by external influence.
- Wrong drive R.P.M. and travelling speeds.
- Fitting wrong spreading discs (e.g. mixing them up).
- Wrong setting of the machine, not adhering to the setting chart).

Therefore, check and ensure that your machine is functioning correctly before and during use.

Claims regarding damage not having occurred on the machine itself will be rejected. This also applies for damage due to spreading errors.



## 2. Safety

This instruction manual contains basic advice, which has to be observed when mounting, operating and maintaining the machine. Thus, this instruction manual has implicitly to be read by the operator before starting to operate and this book must be made available to him.

All safety advice in this instruction manual must be strictly observed and adhered to.

### 2.1 Danger when not adhering to the safety advice

Not adhering to the safety advice

- may result in endangering persons, also the environment and also the machine itself.
- may result in the rejection of any claim for damage.

Not paying attention to the safety advice may cause the following risks:

- Danger to persons not excluded from operational areas.
- Failure of important functions within the machine.
- Failure of carrying out prescribed measures of maintenance and repair.
- Danger to persons through physical or chemical contact.
- Danger to persons, or the environment by leaking hydraulic oil.

### 2.2 Qualification of operator

The implement may only be operated, maintained and repaired by persons, who are acquainted with it and have been informed of the relevant dangers.

## 2.3 Identification of advice in this instruction manual

### 2.3.1 General danger symbol

The safety advice in this operators manual, which may lead to a danger to persons if not being observed, are identified with the general danger symbol (Danger symbol according to DIN 4844-W9)



### 2.3.2 Attention symbol

Attention symbols which may cause dangers to the machine and it's function when not being adhered to, are identified with the attention symbol.



### 2.3.3 Hint symbol

This symbol marks machine's specific points that should be observed to ensure the correct spreading operation.





### 2.3.4 "Attention" pictographs and "advice" pictographs on the machine

- Attention pictographs indicate dangerous points on the machine. Observing these pictographs means safety for all persons using this machine. The attention pictographs always are linked to safety/warning symbols.
- The advice pictographs mark the machine's specific points which have to be observed to ensure correct spreading operation.
- Strictly observe all warning and advice pictographs.
- Please pass on all safety advice also to other users.
- Please always keep all attention and advice signs clean and in an easily readable condition. Please ask for replacement of damaged or missing decals from your dealer and attach to relevant place. (picture-No.: = Order-No.)

Fig. 2.1 and Fig. 2.2 show the fixing points of attention signs and advice signs. Please refer to the following pages for relevant explanations.

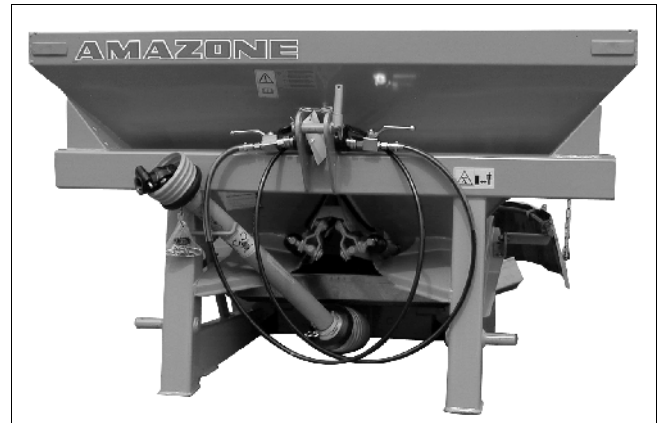
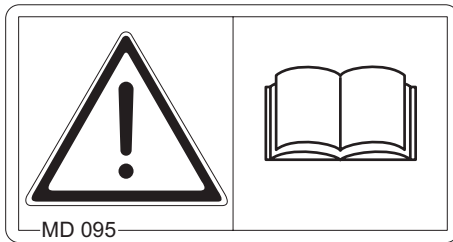


Fig. 2.1



Fig. 2.2

Picture No.: **MD 095****Explanation:**

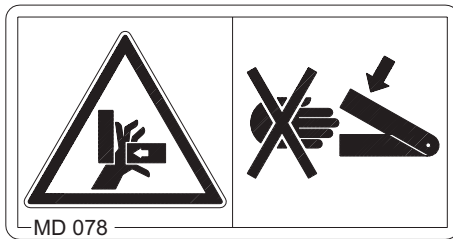
Before commencing operation read thoroughly operators manual and safety advice.

Picture No.: **MD 075****Explanation:**

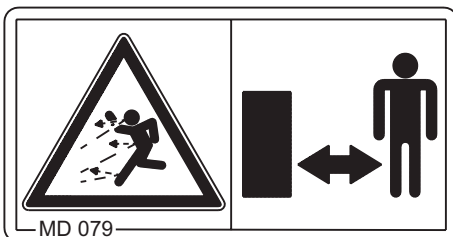
Do not stay within the zone of spinning spreading discs.

Do not touch moving implement parts. Await their absolute standstill.

Disengage PTO-shaft, stop the engine, and remove the ignition key before exchanging the spreading discs.

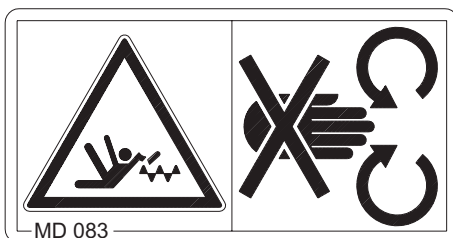
Picture No.: **MD 078****Explanation:**

Never reach into the zone of danger of bruising (e.g. shutter slides and shutter openings) as long as parts can still move there.

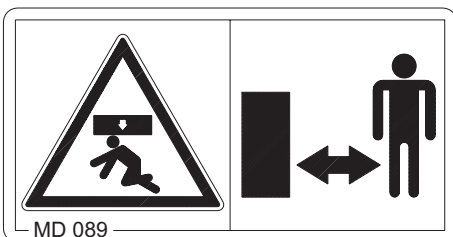
Picture No.: **MD 079****Explanation:**

Danger because of flinging spreading material particles.

Advise people to leave the danger area.

Picture No.: **MD 083****Explanation:**

Never reach into the rotating agitator spiral.

Picture No.: **MD 089****Explanation:**

Never stay under a lifted spreader (unsecured load).

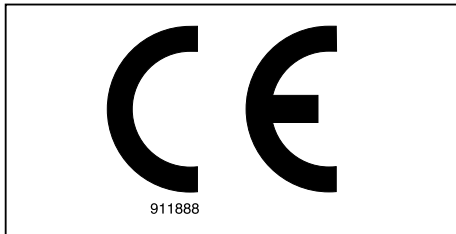


Picture No.: **MD 093**

**Explanation:**

Danger from rotating machine parts.

Never touch rotating shafts, spreading discs, etc.



Picture No.: **911 888**

**Explanation:**

The CE sign indicates that the implement fulfils the requirements of the EC guide line Machine 89/392/EEG and the relevant additional guide lines.

Bild-Nr.: / Figure n°.: / Picture No.: / Afb.nr.: **912 304**



**D**

**Gelenkwellenlänge beachten (sonst Getriebschaden). Siehe Betriebsanleitung.**

**F**

**Veiller impérativement à la longueur de la transmission (risque d'endommagement du boîtier). Voir le manuel d'utilisation.**

**GB**

**Check correct p.t.o. shaft length (otherwise gearbox damage will result). - see instruction book.**

**NL**

**Geeft aandacht aan de lengte van de aftakas zoals de gebruikshandleiding aangeeft, anders kan de aandrijfkast beschadigen.**

912 304

Bild-Nr.: / Figure n°.: / Picture No.: / Afb.nr.: 912 336



**D**

Zapfwelle nur bei niedriger Motordrehzahl einkuppeln.  
Bei Überlastung schert die Sicherungsschraube ab.  
Bei häufigem Abscheren Gelenkwelle mit Reibkupplung einsetzen.

**F**

La prise de force ne doit être enclenchée qu'à régime moteur réduit.  
En cas de surcharge, la vis de sécurité se casse.  
En cas de cisaillement fréquent, utiliser une transmission avec limiteur de couple à friction.

**GB**

Engage pto-shaft only at low engine speed.  
In case of overstrain the shear bolt shears off.  
If shear bolt shears off too frequently we recommend the use of a pto shaft with friction clutch.

**NL**

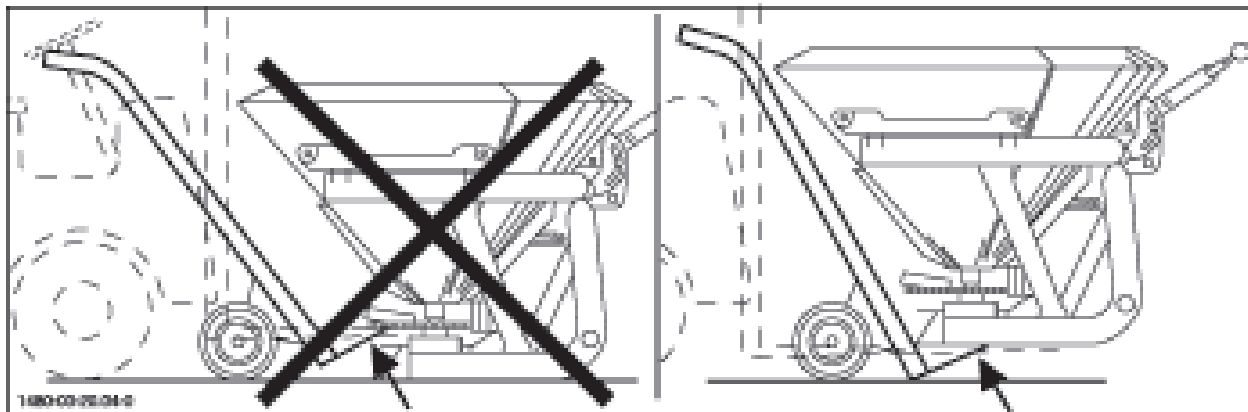
Aftakas alleen bij laag motortoerental inkoppelen.  
Bij overbelasting breekt de breekbout af.  
Bij dikwijls breken een aftakas met slipkoppeling toepassen.

912 336

Bild-Nr.: / Figure n°.: / Picture No.: / Afb. Nr.: 1480-00-20.04-0

#### Explanation:

For transport, do not lift the centrifugal broadcaster from under the spreading discs.





1. Vorderachsentslastung des Schleppers beachten.
2. Rührfinger, Auslauföffnungen und Streuschaufeln sauber und funktionsfähig halten.



1. Veiller à la bonne adhérence de l'essieu avant.
2. Maintenir propres et opérationnels les agitateurs, les orifices d'alimentation et les aubes.

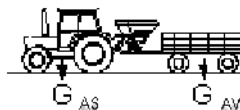


1. Bear in mind front axle weight reduction.
2. Always keep agitator fingers, outlets and vanes clean and replace when worn or damaged.



1. Op de vooras ontlasting van de traktor letten.
2. Roerdersvingers, uitloop-openingen en strooischoepen schoon en bedrijfs gereed houden.

912 312



$$1) V_{\max} = 25 \text{ km/h}$$

$$2) G_{AW} = \max. 1,25 \times G_{AS}; G_{AW \max} = 5t$$



Nur zulässig bei Anhängern mit Auflauf- oder Seilzugbremse.



Autorisé seulement sur remorque disposant de son propre système de freinage.



Only permissible with trailers which are equipped with over-run or with Bowden cable brakes.



Uitsluitend toegestaan bij aanhangers met oploop-of-kabel-trekrem.



## 2.4 Safety conscious operation

Besides the safety advice in this instruction manual additionally, the national, and generally valid operation safety and accident prevention advice of the authorised trade association are binding, especially UVV 3.1, UVV 3.2 and UVV 3.4.

Adhere to the safety advice on the decals on the machine.

When travelling on public roads observe the traffic regulations in force in your country.

## 2.5 Safety advice for the operator

### 2.5.1 General safety and accident prevention advice

#### Basic principle:

Always check traffic and operational safety before putting the machine to operation.

1. Adhere to the general rules of health- and safety precautions besides the advice in this instruction manual.
2. The fitted warning- and advising decals give important hints for a safe operation; adhering to them protects your own safety.
3. When making use of public roads adhere to applicable traffic rules.
4. Become acquainted with the machines controls and functions before beginning the operation. Doing this during operation would be too late.
5. Avoid wearing any loose clothing that would possibly wrap or catch on moving machinery.
6. Avoid danger of fire by keeping the machine clean.
7. Before beginning to move, check surrounding area (children etc.). Ensure sufficient visibility.
8. Sitting or standing on the implement during operation or during transport is not permissible.
9. Attach implements as advised and only to the advised devices.
10. Special care should be taken when the implement is coupled to or off the tractor.
11. When attaching or removing the machine bring any parking or storing devices into the corresponding position (standing safety).
12. Fit weights always to the fixing points provided and as advised for that purpose.
13. Adhere to the maximum permissible axle loads, total weights and transport dimensions.
14. Observe the outer permissible transport dimensions according to your national traffic law.
15. Fit and check transport gear, traffic lights, warnings and guards.
16. The release ropes for quick coupling three point linkages should hang freely and in the lowered position must not release by themselves.
17. During driving never leave the operator's seat.
18. Mount the implement as prescribed. Moving behaviour, steerability and braking are influenced by mounted implements, trailers and ballast weights. Check sufficient steerability and braking.
19. When lifting a three-point-implement the front axle load of the tractor is reduced depending on its size. The sufficient front axle load (20% of the tractor net weight) must be observed (pls.see instruction book of the vehicle manufacturer).
20. When driving into bends mind the projection to the sides and the gyrating mass of the implement.  
To avoid sideways swing of the spreader during operation stabilise the lower link arms of the three-point-hydraulic.
21. Take implement only into operation when all guards are fixed in position.
22. Never stay or let anyone stay within the operation area of the implement.
23. Hydraulic folding frames may only be actuated when nobody is staying in the swivelling range.
24. On all hydraulically actuated pivoting parts exists danger of injury by bruising and trapping.
25. Before leaving the tractor lower the implement to the ground. Actuate the parking brakes, stop the engine and remove ignition key.
26. Nobody should stay between tractor and implement if the tractor is not secured against rolling away by the parking brake and/or by chocks.  
**Never stay or let anyone stay within the operation area. Danger by fertiliser particles being thrown around. Before starting to operate the spreading discs make sure that nobody is staying in the spreading zone. Do not approach rotating spinner discs.**
27. **Filling the fertiliser may only be done with a stopped vehicle engine, removed ignition key and closed shutters.**  
**Note maximum permissible filling loads. Bear in mind the spreading material bulk density [kg/l]. The spreading material bulk densities can be read off the setting chart or have to be determined. Please refer to para. 1.6.**
28. If a trailer hitch is provided it must only be used for towing suitable if:
  - the maximum speed of max. **25 km/h** is not exceeded.
  - the trailer has a run-on brake or a brake which can be actuated from the vehicle operator.
  - the permissible total weight of the trailer is not more than **1,25-times** the permissible total weight of the towing vehicle, however, **3 tons** in maximum.

Single axle trailers must not be towed by rear mounted implements under any circumstances.

29. Do not place any foreign objects inside the hopper.
30. During the calibration test watch out for danger zones due to rotating implement parts.
31. **Never park or move the spreader with filled hopper (danger of tipping over).**
32. If the implement is transported over longer distances with a filled hopper, closed shutters and out of function (en route to operation), open the shutter slides entirely before starting the spreading operation, e.g. before engaging the PTO-shaft. Then slowly engage the PTO-shaft and execute a short stationary spreading. Only now, after having set the shutters onto the desired spreading rate start spreading.
33. **Before any operation check perfect seat of the fixing parts, especially for spreading disc- and spreading vane-fixing.**

### 2.5.2 General safety and accident prevention advice for mounted implements

1. Before mounting and dismounting implements to the three-point linkage bring all control levers in such a position that an unintended lifting or lowering is impossible.
2. When fitting to the three-point linkage the mounting categories on the vehicle and the implement must coincide.
3. Within the range of the three-point linkage danger of bruising and shearing.
4. When actuating the control levers for the three-point linkage never step between vehicle and implement.
5. In transport position of the implement always take care for a sufficient lateral locking of the three point.
6. When driving on public roads with lifted implement the control lever has to be locked against unintended lowering.
7. Mount and dismount implements as prescribed. Observe manufacturer's advice.
8. Working implements should only be transported and driven on vehicles which are designed to do this.

### 2.5.3 General safety and accident prevention advice when operating with PTO shafts

1. Use only PTO shafts which are designed for the implement by the manufacturer and which are equipped with all legally requested guards.
2. Guard tubes and cones of the PTO shaft as well as a vehicle and implement side PTO guard must be fitted and kept in a proper condition.
3. On PTO shafts always ensure the tube has sufficient overlap in transport- and operating position. (Observe instruction manual of the PTO shaft manufacturer.)
4. Fit and remove the PTO shaft only when the universal joint shaft is disengaged and when the engine is stopped and ignition key is removed.
5. Ascertain correct fitting and securing of the PTO support.
6. Prevent PTO guard from spinning by fixing the provided chain to a nearby static part.
7. Before switching on the PTO shaft ensure that the chosen PTO speed of the tractor corresponds to the allowable implement input speed. Usually the PTO shaft speed is 540 R.P.M. (please observe data in the setting chart).
8. Slow engagement of the PTO shaft protects vehicle and spreader.
9. When using the ground-related PTO take into account that the PTO speed depends on the driving speed and that the turning direction is reversed when driving backwards.



10. Before switching on the PTO shaft take care that no one stays in the danger zone of the implement.
11. Never switch on the tractor PTO while engine is stopped.
12. When operating with a switched on PTO shaft allow no one to stay near to the spinning PTO or universal joint shaft.
13. Always stop PTO when it is not needed or when the shaft is in an adverse position. Disengage the universal joint shaft as soon as the outlet openings are closed.
14. Attention! After switching off the PTO the mounted implement may continue to run by its dynamic mass.  
During this period never come too close to the implement. Begin to work on the implement only after it has come to a full standstill.
15. Clean and grease the universal joint shaft and the PTO driven implement only after the PTO shaft and engine have been stopped and ignition key pulled out.
16. Place the uncoupled PTO shaft on the retaining support provided.
17. After removal of PTO shaft apply guard cap onto PTO stub.
18. Immediately repair any damage before operation to avoid consequential problems.

#### **2.5.4 General safety and accident prevention advice for the hydraulic system**

1. The hydraulic system is under high pressure.
2. Connect hydraulic hoses to the hydraulic rams and motors according to the advice in the instructions.
3. When fitting the hydraulic hoses to the vehicle hydraulic sockets always ensure that the hydraulic system on the vehicle as well as on the implement is without pressure.
4. To avoid wrong hydraulic connection between vehicle and implement, sockets and plugs should be marked (e. g. colour coded). This helps to prevent contrary function (lifting instead of lowering or vice versa) and reduces the danger of accident!
5. All hydraulic hoses must be checked for their operational safety by a skilled person before the first operation of the machine and then at least once a year. In case of damage or ageing replace the hydraulic hoses! The replacement hoses must correspond to the technical demands of the implement manufacturer.
6. When searching for leaks appropriate aids should be used because of the danger of injury.
7. Liquids leaking under high pressure (hydraulic oil) can penetrate the skin and cause severe injury. When injured see a doctor immediately! Danger of infection.
8. Before starting to do repair work to the hydraulic system release the pressure by actuating the control lever accordingly, lower machine to the ground and stop vehicle engine.
9. The period of use of any hose circuit should not exceed six years including a possible storing period of two years maximum. Also when stored and used properly hoses and hose circuits do age. Therefore their longevity and period of use is limited. Deviations from the above may be accepted by the Health- and Safety Authorities depending on the experience they have had and the danger potential. For hoses and hose circuits made of thermoplasts other guide lines may prevail.
10. In case of injuries caused by penetrating oil, immediately see a doctor.



## 2.6 General safety and accident prevention advice for maintenance, repair and cleaning

1. Repair-, maintenance- and cleaning operations as well as the remedy of function faults should principally be conducted with drive and engine stopped. Remove ignition key.
  2. Check nuts and bolts for tightness regularly. For the first time after 3 – 4 hopper fillings. If necessary retighten nuts and bolts.
  3. When doing maintenance work on the lifted implement make sure that it is secured by proper supports.
  4. Dispose of oil, grease and filters in the appropriate manner.
  5. Before !
  6. Before conducting electric welding operations on vehicle or on the mounted implement, remove cable from generator and battery!
  7. Any spare parts fitted must, as a minimum meet with the implement manufacturers' fixed technical standards. Using original **AMAZONE** spare parts for example ensures this. Non original parts invalidate warranty and contravene these documentation for safe use.
-



### 3. Description of product

The road gritter **ZA-XS** has been designed for the rear 3-point linkage (cat. II) of a towing vehicle.

The spreading discs are driven either by the PTO shaft or a hydraulic motor.

#### The spreader consists of the components:

- Frame and hopper (3.1/1), with its two hopper tips (3.1/2),
- Shutter slide control,
- Gearbox with spreading discs (3.1/3),
- Mixing agitator and
- multiple spread width limiting (3.1/4).

#### The spreader is as standard equipped with:

- Tractor-3-point linkage cat. II.
- Drive via Walterscheid-PTO shaft (ZA-XS) or hydraulic motor (ZA-XS H).
- Pre-selection switch for spread rate setting.
- Guard screen.
- Mixing agitator.

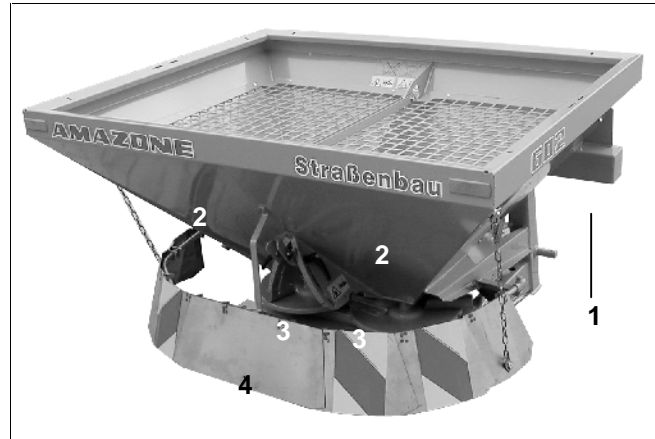


Fig. 3.1

### 3.1 Function

The spreading material slides down the hopper walls to the discharge openings (3.2/1). The mixing agitator (3.2/2) feeds the spreading material evenly onto the discs, provides an even spreading material flow on to the spreading discs.

The spreading discs (3.3/1) rotate in arrow direction and are provided with each one short (3.3/3) and one long (3.3/3) spreading vane.

Setting the various **spreading widths** is done via the multiple **spread width reducer** (3.3/4). Depending on the kind of spreading material **working widths** of between **1 and 6 m** are settable.

The **spread rate** is set by setting levers (3.3/5) (they function as stop for the shutter slides). Determine the required **shutter slide position** either by experience value or take it from the **setting chart**. Read the **shutter slide position** off the **scale** (3.3/6) .

Opening and closing the shutter slides via the **shutter control**.

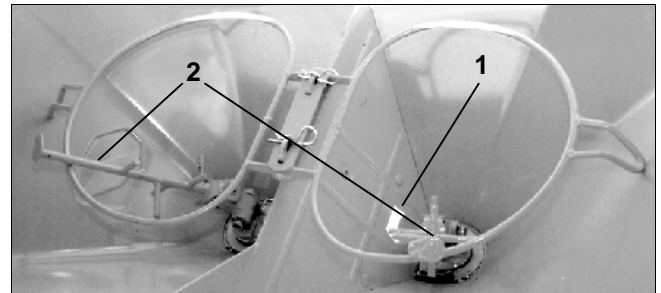


Fig. 3.2

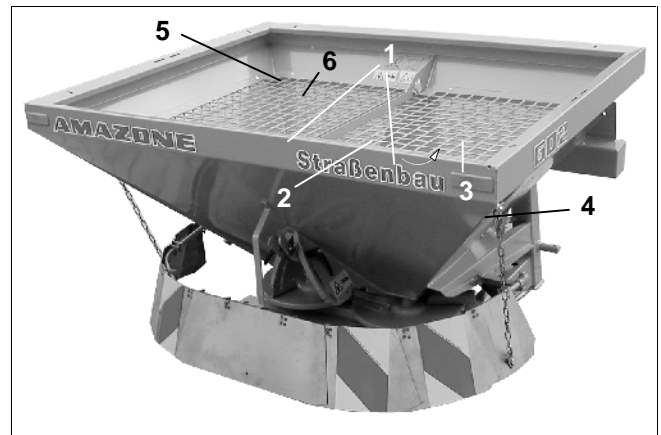


Fig. 3.3

### 3.2 Shutter control

#### 3.2.1 Manual actuation

With the manual actuation (3.4/1) both shutters can be opened and closed either

- simultaneously
- or
- **individually** for single shutter control for half side spreading.

### 3.2.2 Hydraulic shutter slide actuation

The hydraulic shutter control (Fig. 3.5) allows opening and closing both shutters either

- **simultaneously** (shutter control "I" and "II")
- or
- for single shutter actuation for half side spreading **individually** (combi lever "I")

With shutter control "II" and combi lever "I" the shutters are closed via hydraulic rams (3.5/1) and opened via springs (3.5/2).

With the shutter control "II" the shutters are closed and opened via a double acting hydraulic rams.

For closing the shutter set the spool valve of the towing vehicle to "lifting" and for opening to "lowering".

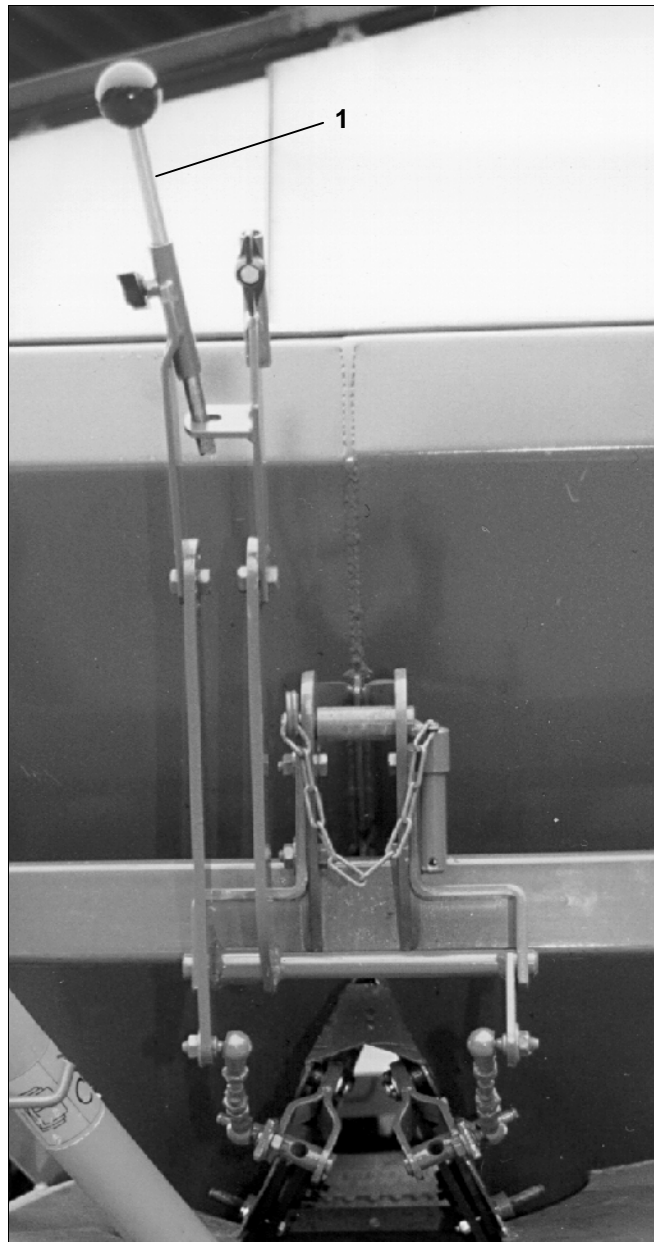


Fig. 3.4

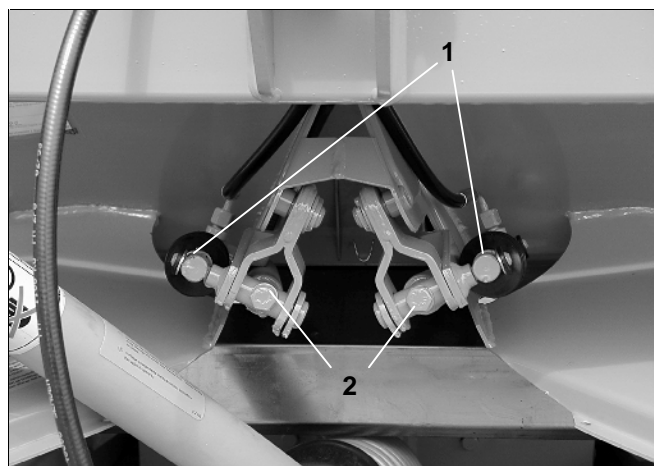


Fig. 3.5

## 4. On receipt of the machine

The spreader (4.1/1) is supplied with PTO shaft (4.1/2).

Check that no damage has been caused in transit and all parts are present according to the delivery note



**Please check the correct fitting of the spreading discs. The open U of the spreading discs (4.2/1) points into direction of rotation (4.2/2).**

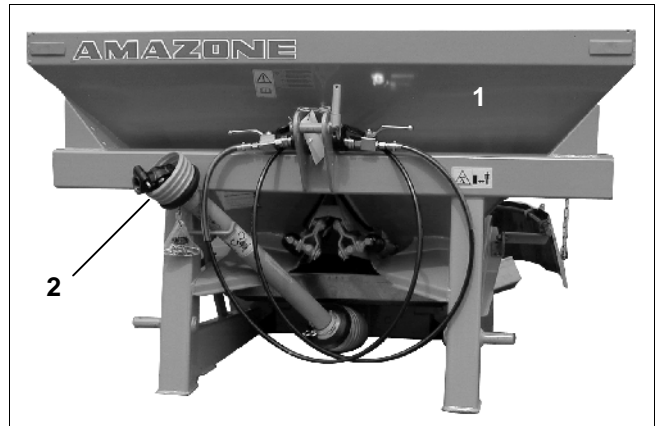


Fig. 4.1

### 4.1 Function control

Carry out a function control after receipt of the machine (4.1/1).

For checking the function turn the machine by hand (4.1/1) one time on the gearbox input shaft.

Check lubrication of the PTO shaft (4.1/2) and the oil level in the gearbox (Please refer to chapter "Maintenance").

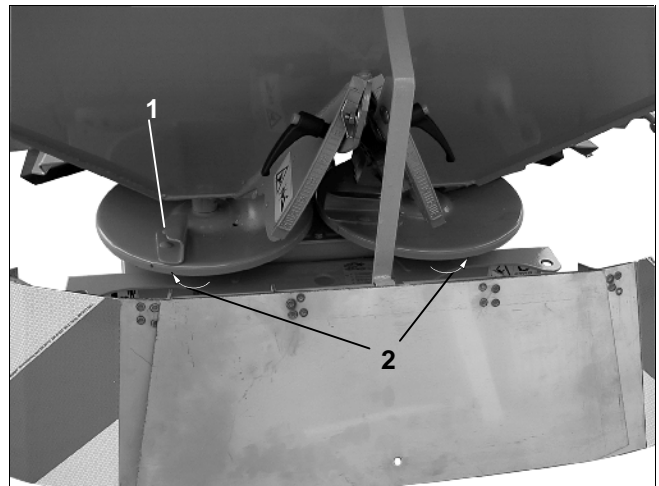


Fig. 4.2



## 4.2 Fitting the PTO shaft



**Danger of tipping over.**  
Assemble centrifugal broadcasters only with empty hopper.

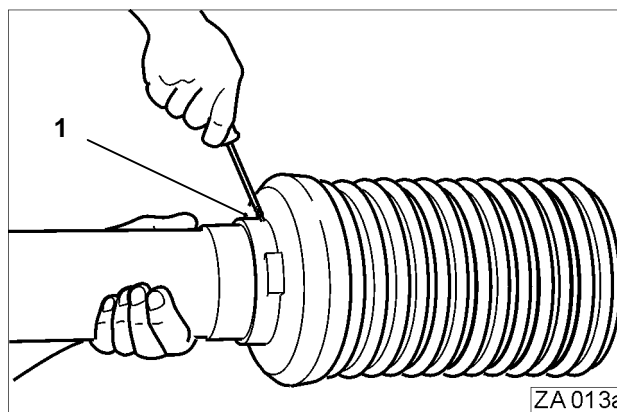


**Only use the PTO shaft prescribed by the manufacturer.** Walterscheid-PTO shaft (W100E-SD05-710).



**Observe the instruction manual of the PTO shaft manufacturer.**

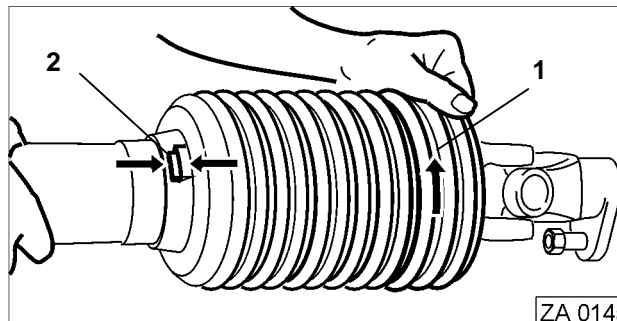
- Remove fixing bolt (4.3/1).



ZA 013a

**Fig. 4.3**

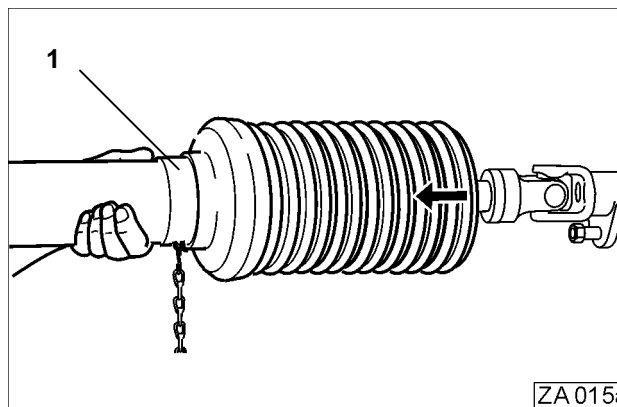
- Twist cone (4.4/1) into fitting position (4.4/2).



ZA 014a

**Fig. 4.4**

- Pull off protective half (4.5/1).



ZA 015a

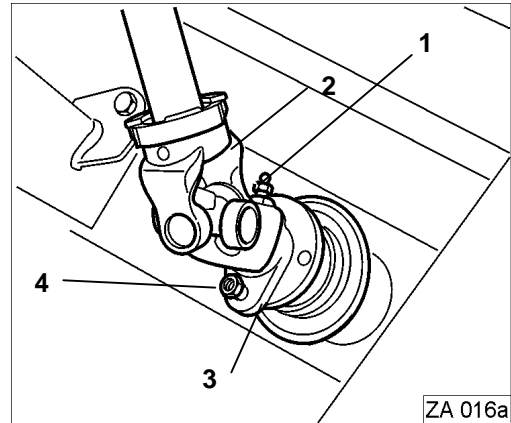
**Fig. 4.5**

- Tilt the machine to the rear.



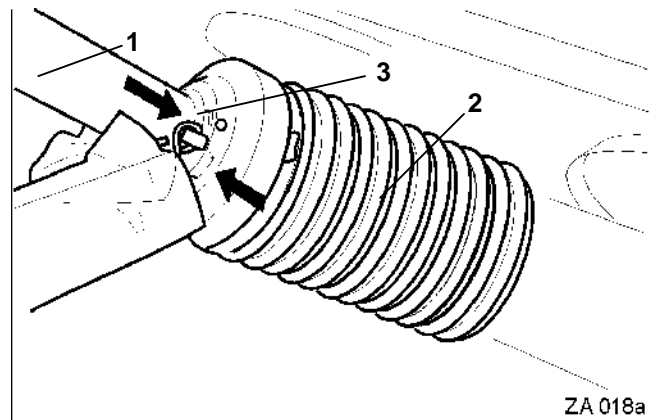
**Before fitting the PTO shaft clean and grease the gearbox input shaft.**

- Slacken greasing nipple (4.7/1).
- Push on PTO shaft (4.7/2).
- Affix connecting yoke (4.7/3) with shear bolt (4.7/4).
- Tighten greasing nipple (4.7/1).



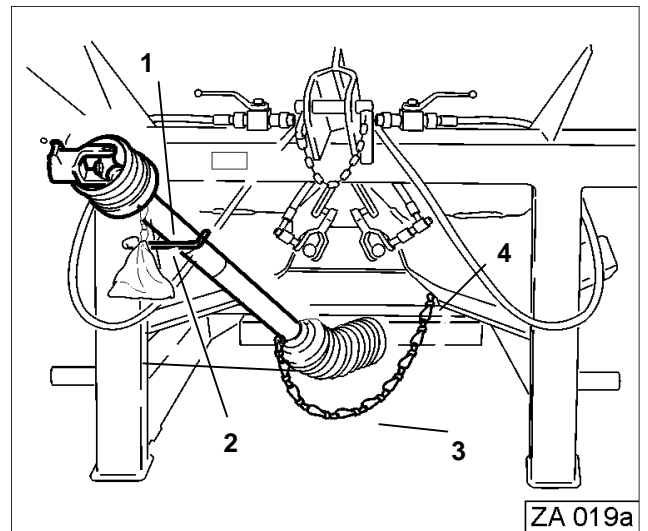
**Fig. 4.6**

- Push on guard cone (4.7/1).
- Twist guard cone (4.7/2) into fitting position.
- Screw in locking bolt (4.7/3).
- Tilt machine to the front.



**Fig. 4.7**

- Push on second PTO shaft half (4.8/1) and place in retainer (4.8/2).
- Secure guard tube with chain (4.8/3) on the retainer (4.8/4).



**Fig. 4.8**

### 4.3 Assembly of hydraulic drive

Fig. 4.9/...

- 1 – Hydraulic motor
  - 2 - Shaft coupling half –Hydraulic motor
  - 3 - Catch
  - 4 – Shaft coupling half – gearbox input shaft
  - 5 - Console
  - 6 – Hydraulic hoses
- Push shaft coupling half – gearbox input shaft (4.9/4) on gearbox input shaft of the spreader and secure by using a self cutting screw.
  - Push catch (4.9/3) on shaft coupling half – gearbox input shaft (4.9/4).
  - Push shaft coupling half – hydraulic motor (4.9/2) on the hydraulic motor shaft and secure by using a self cutting screw.
  - Bolt hydraulic hoses (4.9/6) on to the hydraulic motor.

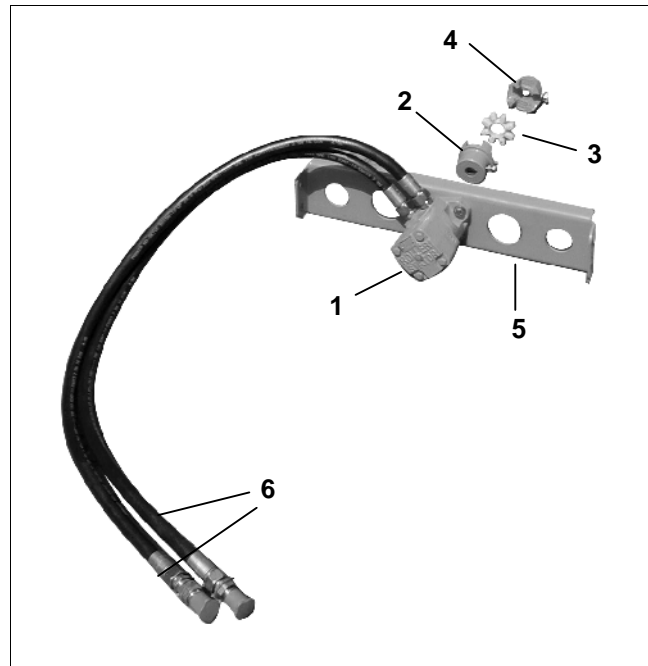


Fig. 4.9



**The oil pressure hose is equipped with a silver galvanised plug, soft pressure spring on the plug and return valve.**



**The "flow hose" is equipped with yellow galvanised plug and hard pressure spring on the plug.**

- Assemble the shaft coupling halves and use bolts to fix the hydraulic motor on the (4.9/5) .
- Bolt console on to the control frame.



## 5. Mounting and dismounting



When fitting to the three-point linkage the mounting categories on the towing vehicle and the spreader must coincide or matched if necessary.



Mount the spreader as prescribed to the and only to the correct tools.



Danger of injury within the range of the three point linkage by squeezing and shearing. Take special care when mounting and dismounting implements to and off the towing vehicle.



Danger of tipping over!

For mounting and dismounting place the spreader on level ground. Don't lift at the front.



Danger of tipping over!

Mount and dismount the spreader only with an empty hopper.



Danger of tipping over

Advise people to leave the danger zone behind or underneath the machine.



Danger of tipping over

When linking up observe sufficient space for movement of the lower links.



Danger of tipping over.

Lift machine only with attached upper link.



Any operation on the spreader should only be carried out with switched off motor and pressure-free hydraulic system. Remove ignition key. Secure the vehicle against unintended starting and rolling away.



Ensure a horizontal and lateral stable mounting cross ways to the driving direction to prevent the machine from swinging to and fro during spreading operation.



The speed of lowering the filled spreader must never be faster than 2 seconds. If available set the throttle valve accordingly.



## 5.1 Mounting

**Mount the spreader to the rear three-point hydraulic (cat. II) of the towing vehicle (please also refer to para. 2.5.2).**

- Push lower link of the three point hydraulic on to the lower link pin (cat. II) (5.1/1) and secure by using a clip pin.
- Fix upper link with fixing pin (cat. I or II) (5.1/2) and secure.



**Never fix upper link of cat. II with pin cat. I.**

- Connect the hydraulic (5.1/3 or 5.2/1, 5.2/2) of the hydraulic shutter control or of the hydraulic drive in the appropriate way (for this, please also refer to para. 1.6.2.).



**When connecting the hydraulic hoses with the vehicle hydraulic system**

- the hydraulic system must be free of pressure on both sides.
- the ball taps (5.2/3 and 5.2/4) must be shut off:
- **Position A!**
- the corresponding spool valves must be in the float position.

- Push the PTO shaft (ZA-XS) on to the universal joint shaft of the towing vehicle.



**Ensure a proper catching of the PTO shaft connection.**



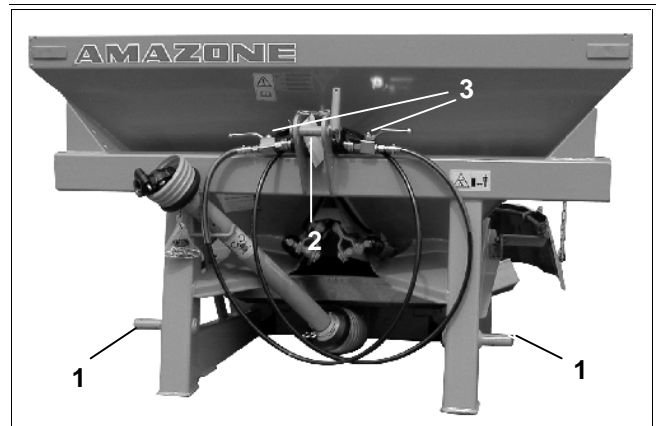
**When initially fitted and when changing the vehicle type match PTO shaft (for this, please refer to para. 5.3).**

**Hook in fixing chains of the PTO shaft guard on towing vehicle and implement side so that a sufficient swivel range of the PTO shaft in all operating positions is ensured and that the PTO shaft guard does not spin during operation.**

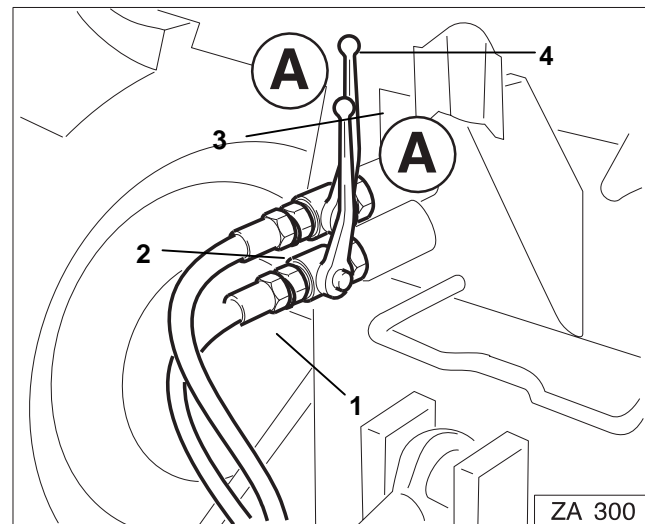


**On towing vehicle and implement only use PTO shaft with complete guard and additional guard fitted. Replace guards immediately once they have been damaged.**

- For function check actuate shutters hydraulically and ensure that they shut off and open completely.



**Fig. 5.1**



**Fig. 5.2**



When actuating the hydraulics never reach into the shutter opening, danger of injury.!

## 5.2 Dismounting

- For dismounting place the spreader always on level ground.
- Unplug the hydraulic connection hoses (5.3/1 and 5.3/2) and place them into the provided carriers.
- Place PTO shaft (5.3/3) into the retainer (see illustration).

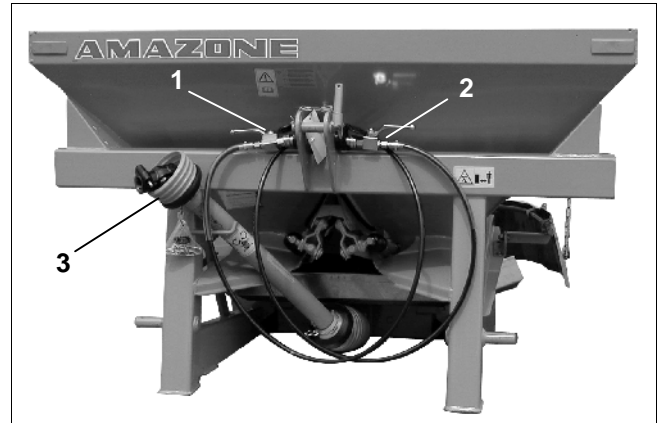


Fig. 5.3

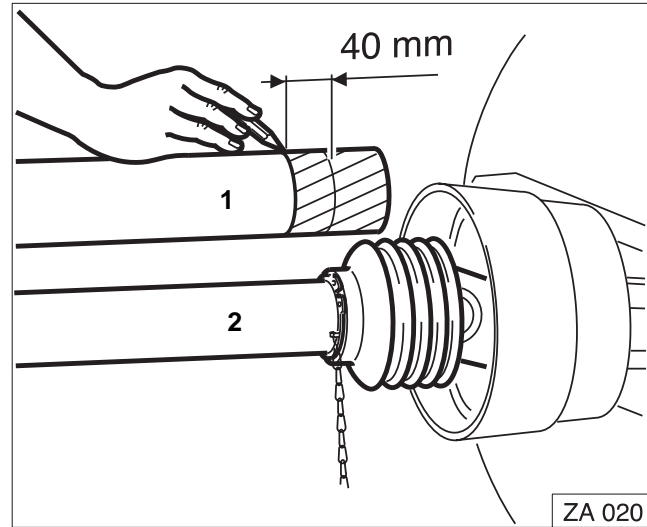
### 5.3 Initial fitting and matching up of the PTO shaft

When initially fitting, match PTO shaft to the vehicle. As this matching only applies for this specific vehicle type, check or repeat PTO shaft matching when changing vehicles.



**Observe the instruction manual of the PTO shaft manufacturer.**

- Pull apart the PTO shaft halves.
- Fit PTO shaft half to the vehicle side.
- Hold the PTO shaft halves (5.4/1) and (5.4/2) in their shortest and longest operational position side by side and check the **overlap of the PTO shaft tubes**.
- In **shortest position** the universal joint shaft tubes must never hit the universal yokes. Allow a safety spacing of **at least 40 mm**.
- In the **longest** operational position the **PTO shaft tube overlapping** prescribed by the PTO shaft manufacturer has to be observed (please refer to the instruction manual of the PTO shaft manufacturer).
- For matching the length of the PTO shaft halves hold them side by side in the closest operational position, mark and shorten according to indication of the PTO shaft manufacturer.
- Insert PTO shaft halves into one another.
- Push PTO shaft on the vehicle's universal joint shaft.



**Fig. 5.4**

## 6. Transport on public roads



Check and fit transport equipment as e.g. traffic lights, warning plates and guards if required.



For travelling on public roads with the spreader mounting to a towing vehicle observe the traffic regulations in force in your country.



Vehicle owners as well as the operators are responsible for adhering to the legal traffic regulations of their country.

According to the harmonised European traffic regulations traffic lights and warning plates are required on spreaders mounted to a towing vehicle. These regulations read as follows:

- If the prescribed rear lights, the direction indicators or the registration No. of the towing vehicle are hidden by the spreader (or other implement) they will have to be repeated on the mounted implement. If the sides of the mounted implements protrude more than 400 mm the outer edge of the light emitting source of the limiting or tail lights of the towing vehicle, extra parking warning plates and limiting lights are required. If the mounted implement protrudes more than 1 m beyond the tail lights of the towing vehicle parking warning plates, rear light units and rear reflectors are required. The light units and possibly required parking warning plates and foils can be obtained from your dealer directly. As always the latest edition of the national traffic regulations is valid, please verify them at your local traffic office.



The traffic light kit has to correspond to the requirements of your national traffic law.



Check proper function of traffic light kit..



Moving characteristics, steering and braking ability are affected by mounted implements, trailers and ballast weights. Therefore, take account to these effects and allow sufficient steering and braking.



Towing axle loads behind rear mounted implements is only exceptionally allowed (see code of practice for mounted implements of the traffic law of your country).

Twin axle trailers may to towed if:

- the max. speed of 25 km/h is not exceeded.
- the trailer has a run-on brake or a brake which can be actuated from the vehicle driver.
- the permissible total weight of the trailer is not more than **1,25 times** the permissible total weight of the vehicle, however, **3 tons in maximum**.



Single axle trailers must not be towed under any circumstances.



## 6.1 Conversions on towing vehicle and spreader for road transport



For road transport only lift the spreader that much that the spacing between road surface and upper edge of the rear lights does not exceed 900 mm.



When travelling on public roads secure the implement against unintended lowering.



In case of leaking control valves and/or longer pauses, e.g. transports, the shutting of the block ball taps (6.1/1 and 6.1/2) prevents a self-opening of the closed shutter. Position A = Shut-off-position.

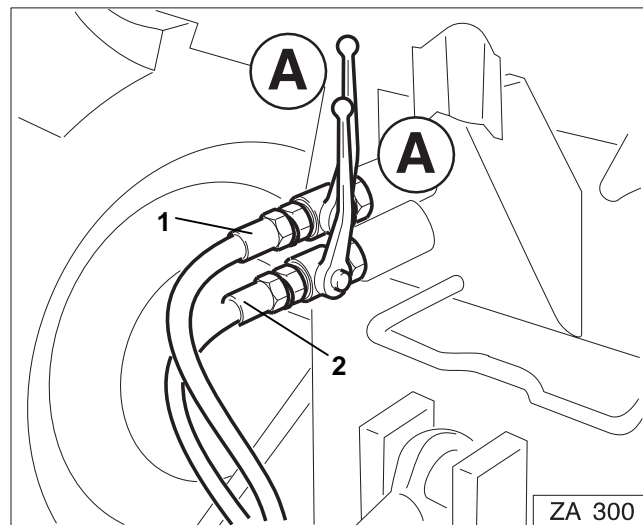


Fig. 6.1

## 7. Settings



When setting the mounting height, ask people to leave the danger zone behind or underneath the implement



Operations on the spreader may only be conducted with the engine switched off and pressure free hydraulic system. Remove ignition key. Secure vehicle against unintended operation and rolling away.



Before commencing any settings or other work on the machine wait until all moving implement parts have come to a complete stand still.

### 7.1 Mounting height

Set the spreader with filled hopper horizontally to a mounting height of 80 cm (Fig. 7.1). Measure the distance between soil surface and spreading disc front side (80) and rear side (80).

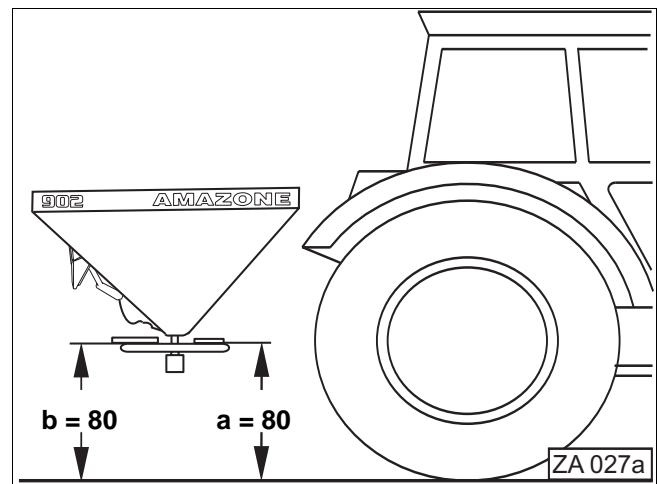


Fig. 7.1



## 7.2 Setting the working width

The multiple spread width reducer (7.2/1) allows the setting of different **working widths**. Depending on the kind of spreading material working widths of between **2 m and 6 m** are achieved by adjusting the tilting of the spread width reduction via a chain suspension (7.2/2) according to experience values or the data given in the **ZA-XS setting chart**.

**Lifting** the spread width reducer – working width is **increased**.

**Lowering** the spread width reducer – working width is **reduced**.

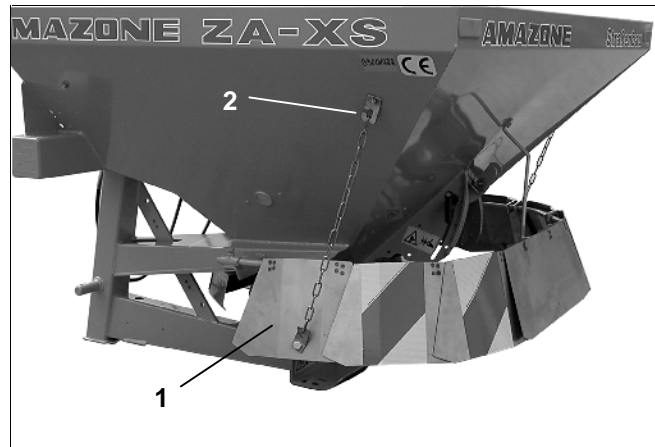


Fig. 7.2



**No accurate spread pattern will be achieved with damaged or bent spreading width reducer elements.**

### 7.2.1 Checking the spreading width

Check the set working width with the aid of

- a yard stick or
- by sight.

If the actual and the required working width do not coincide, re-adjust the selected working width setting.

#### Correction of working width setting:

##### 1. Increasing the working width

- Lift the spread width (7.2/1) – by shortening the chain (7.2/2) or the cable.
- Increase the drive speed depending on the spreading material.

##### 2. Reducing the working width

- Lower the working width reducer – by extending the chain or the cable.
- Reduce the spreading disc drive speed depending on the spreading material.



## 7.2.2 Spreading to one side

The one-side spreading is only possible with the manually actuated shutter control and the hydraulic combi lever control "I".

For one-side spreading close the relevant shutter.

### 1. Manual actuation of shutters

- Uncouple both actuation levers of the shutters.  
For this
  - pull out the right hand actuation (7.4/1) (seen in driving direction) until both shutters open and close independently.

### 2. Hydraulic combi lever control

With the hydraulic combi lever control both shutters can be individually actuated for one-side spreading.

For closing the relevant shutter set its control spool on to "lifting" and for closing on to "lowering".

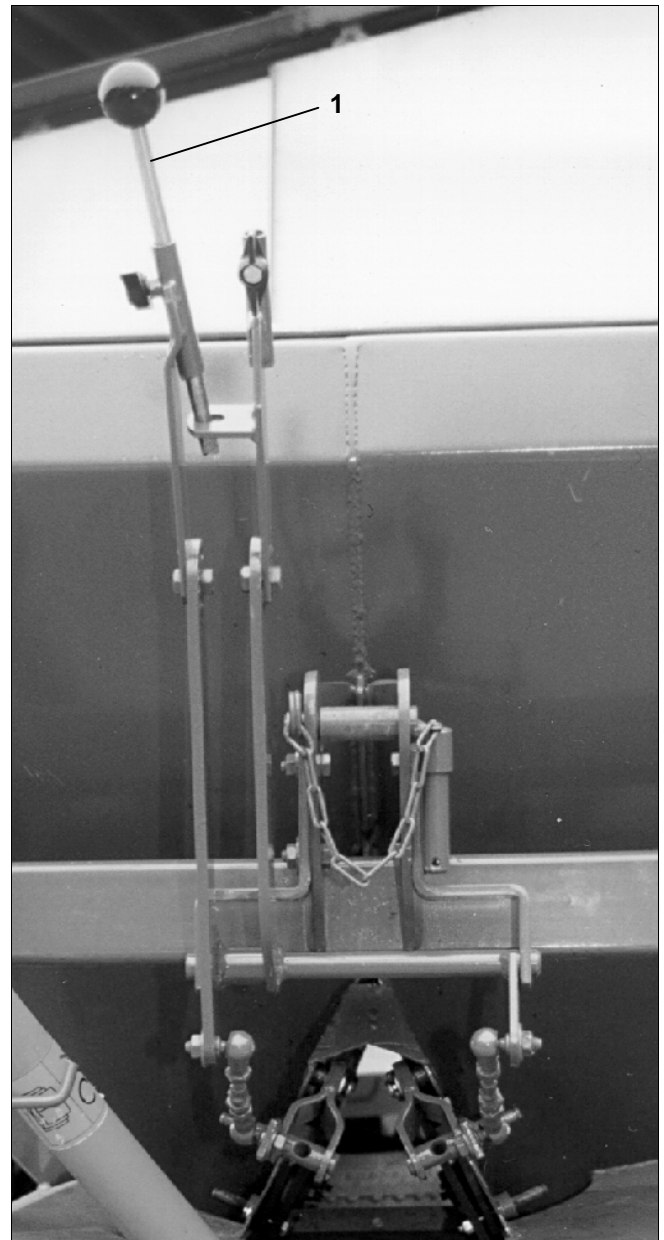


Fig. 7.4

### 7.3 Spread rate

Set and adjust the spread rate only with mounted implement, switched off drive, closed shutters and block taps (hydr. shutter control).

The shutter slide position depends on:

- the kind of spreading material (grit, sand salt or mixture) and its characteristics (granular, coarse/fine, moist, dry).
- the desired spreading width [m].
- the intended operational speed [km/h].
- the desired spread rate [g/m<sup>2</sup>].

The shutter position for the desired spread rate is set via the two setting levers (7.5/1). Set the setting levers on the scale (7.5/2) according to experience value or the indication in the **ZA-XS setting chart**. The desired shutter position is achieved when the shutters rest on the setting lever.

**Moving the setting lever to a higher numerical value on the scale means:**

- larger opening diameter of the discharge openings.
- increased spread rate.



**As the spreading properties of the spreading materials may heavily vary (e.g. moist or dry) we recommend that you determine the desired shutter position for the desired spread rate with the aid of a spread rate check.**

**Set shutter position via setting levers as follows:**

- Close shutter.
- Slacken clamp lever (7.5/3).
- Find the required shutter position on the scale (7.5/2).
- Set the read off edge (7.5/4) of the setting lever pointer (7.5/5) on the scale figure.
- Firmly retighten clamping lever (7.5/3).



**Choose equal shutter position for the right hand and left hand shutter.**



**When spreading only open the shutters after the prescribed spreading disc rev. speed (e.g. 400 min<sup>-1</sup>) is reached.**

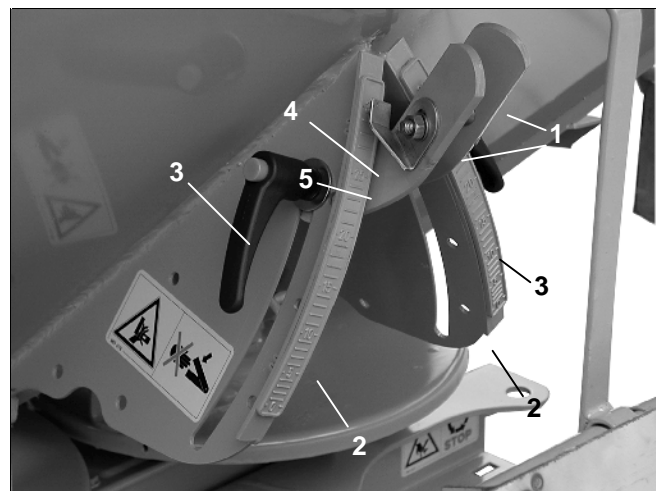


Fig. 7.5

## 7.3.1 Spread rate check

The spread rate [g/m<sup>2</sup>] depends on:

- shutter position.
- operational speed .
- spreading disc rev. speed.
- condition of spreading material (granular, coarse/fine, moist, dry)

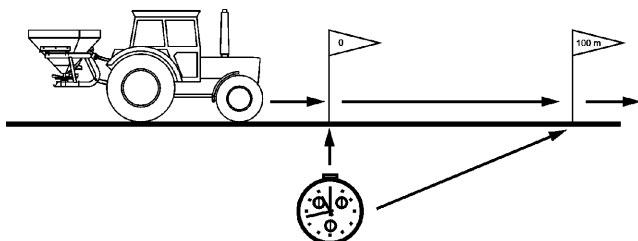


**A spread rate check is recommended with any change of spreading material or when it changed its condition.**

If the operational speed of the towing vehicle is known a stationary spread rate is possible.

### 1. How to determine the actual speed of operation

- Carefully measure a test distance of 100 m. Mark beginning and end of the test distance.
- Drive test distance from beginning to end mark with the intended, constant operational speed. Determine the required time with the aid of a stopwatch.



e.g. 100m in 120 sec.

- Determine the operational speed [km/h].

$$\text{Operational speed [km/h]} = \frac{360}{\text{time for 100 m}}$$

Example: 100 m in 120 sec.

$$\frac{360}{120 \text{ sec.}} = 3 \text{ km/h}$$

### 2. Determining the required spread rate per minute [g/min] for the desired spread rate:

$$\text{So [g/min]} = \text{St [g/m}^2\text{]} \times \text{FI [m}^2\text{/min]}$$

So: required spread rate

St: desired spread rate

FI: Area efficiency

$$\text{FI [m}^2\text{/min]} = \text{W [m/min]} \times \text{A [m]}$$

FI: Area efficiency

W: Driven distance

A: Working width

$$\text{W [m/min]} = \frac{\text{F [m/h]}}{60}$$

W: Driven distance

F: Speed of operation

### Example

Speed of operation F: 3 km/h

Working width A: 4m

Desired spread rate St: 50g/m<sup>2</sup>

Required spread rate So: ? [g/min]

$$\text{W} = \frac{3000 \text{ [m/h]}}{60} = 50 \text{ m/min}$$

FI = 50 m/min x 4m = 200 m<sup>2</sup>/min

So = 50 g/m<sup>2</sup> x 200 m<sup>2</sup>/min = 10 000 g/min

The required spread rate is 10 g/min.

### 3. Spread rate checking procedure

- Place a plastic wrap underneath the spreader.
- Lower the spreader to its lowest position.
- Move the working width reducer in its lowest position (please refer to para. 7.2.1).
- Set the setting lever on the (7.6/1) according to the ZA-FS setting chart or according to experience value.
- Start the towing vehicle's engine. Drive the spreading discs with the disc rev. speed, e.g. **400 min<sup>-1</sup>**, according to the spreading material and the desired working width.
- **Open both shutters for precisely 1 minute.**
- Switch off the spreading disc drive, switch off motor and remove ignition key.
- To determine the actually set spread rate [g/m<sup>2</sup>] weigh the collected amount of spreading material and compare with the determined required spread rate [g/min].



Fig. 7.6

## 8. Putting to operation



Never ever reach into the rotating agitator device.



The bolts of new machines should be checked for tightness after 3 – 4 hopper fillings. If necessary retighten.

### 8.1 Filling



Before filling the hopper make sure that no residue or foreign particles are in the hopper.



When filling pay attention that no foreign objects are in the spreading material.



Observe the permissible payload. Bear in mind the specific bulk density [kg/l]. Depending on the condition of the spreading material (moist or dry) other specific weights may occur.



Before filling check the specific weight of your spreading material. Weigh accurately 1 litre spreading material. The weight is the specific weight [kg/l].



Observe the maximum payload and permissible axle loads and the permissible total weight of the towing vehicle. If necessary travel on public roads with only half filled hopper.



When lifting the spreader the front axle of the towing vehicle is differently relieved depending on the vehicle size.

Therefore, when filling the spreader observe that the required towing vehicle front axle load is maintained (20 % of the vehicle's empty weight, however, also refer to the instruction manual of the vehicle manufacturer). If necessary apply front loads.



Fill hopper only with shutters closed.

### 8.2 Spreading operation



Do not approach rotating spinner discs. Danger of injury. Danger by spreading material particles being thrown around.



material particles being thrown around. Advise people to leave the danger area.



Open shutters only when the prescribed spreading disc rev. speed for the desired working width has been reached.



To avoid a grinding of the spreading material and thus an increased wear of the agitator and the float hopper bottom open the shutters wide enough so that an unhindered flow of the spreading material is ensured (especially important with grit).



When the shutters are closed (even for a short time) strictly observe to switch off the pto shaft..



Always switch off the PTO shaft in case of too large angling.



Spreading material which has frozen over night may cause damage on the agitating device when switching on the spreading disc drive.



Maintain constant PTO speed and driving speed for best performance.



Engage PTO shaft or hydraulic drive only at slow tractor engine speed.



If the implement is transported over longer distances with filled hopper, close shutters and disengage PTO (while travelling to the field), open the shutter slides entirely before starting the spreading operation, e.g. before engaging the PTO-shaft. Then switch on the spreading disc drive and carry out a brief stationary spreading. Only start spreading operation after setting the desired spread rate.



If in spite of an equal shutter position an uneven emptying of the two hopper tips is noted, check the main shutter position.



An appropriate technical state of the spreading vanes helps to ensures an even spreading material lateral distribution.

The operational life of the spreading vanes depends on the spreading materials used, the operation periods and the amounts spread.



### 8.2.1 Spreading on the place of operation



**In case of operation breaks lower the implement or secure against unintended lowering.**

The spreader has been coupled to the towing vehicle, the PTO shaft and/or the hydraulic system are connected.

The **settings** for

- mounting height,
- working width and
- shutter position

have been done.

- Engage the spreading disc drive and drive the spreading discs with the PTO shaft speed required for the desired working width.
- Open shutter slides.
- Maintain constant spreading disc speed and driving speed for best performance.

## 9. Cleaning, maintenance and repair



For cleaning, maintenance and repair, please observe the chapters 2.5.4 and 2.6.



Clean, grease or set the centrifugal broadcaster or the universal joint shaft only after the PTO shaft has been disengaged, the engine has been stopped and the ignition key is removed.



After disengaging the PTO shaft the mounted implement may still continue to run by it's dynamic masses. Begin to work only when the implement has come to a full standstill.



In case of injuries caused by penetrating oil consult a doctor immediately.

### 9.1 Cleaning

After use clean the machine with a normal jet of water (**greased implements only on washing bays with oil traps**).

Clean outlets and shutters especially carefully.

Treat dry machine with an anticorrosive agent(Only use biologically degradable protective agents).

Park machine with **opened, greased** shutters.

## 9.2 Lubrication

### 9.2.1 Greasing of PTO shaft

Fig. 9.1 shows the greasing intervals for the PTO shaft in hours. For further information, please refer to the instruction manual of the PTO shaft manufacturer.

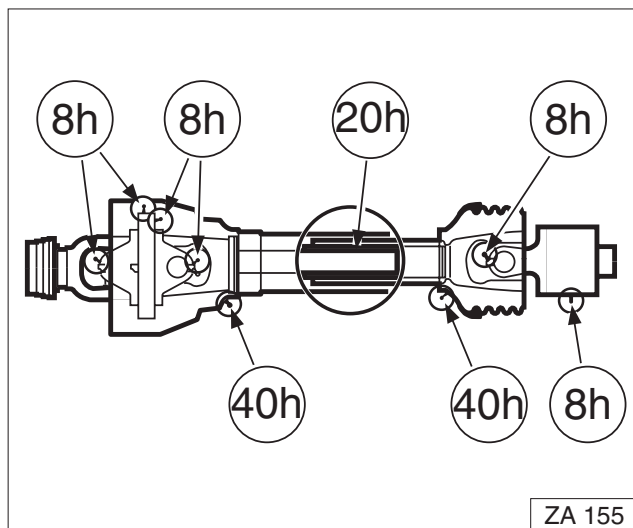


Fig. 9.1



## 9.2.2 Lubricating chart of the spreader

- Apply oil to the greasing points on your centrifugal broadcaster daily before every operation.



**Grease the threads of the T-bolts (9.2/1) for the shutter lever locking as well as their washers, so that the clamping connection remains functioning.**

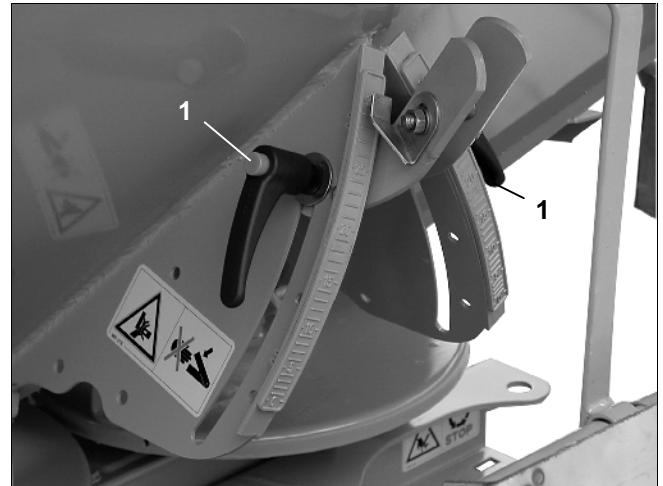


Fig. 9.2

- From time to time remove the **ball joints** (9.3/1) from the switching levers, **clean** and **grease** (only with manual shutter actuation).

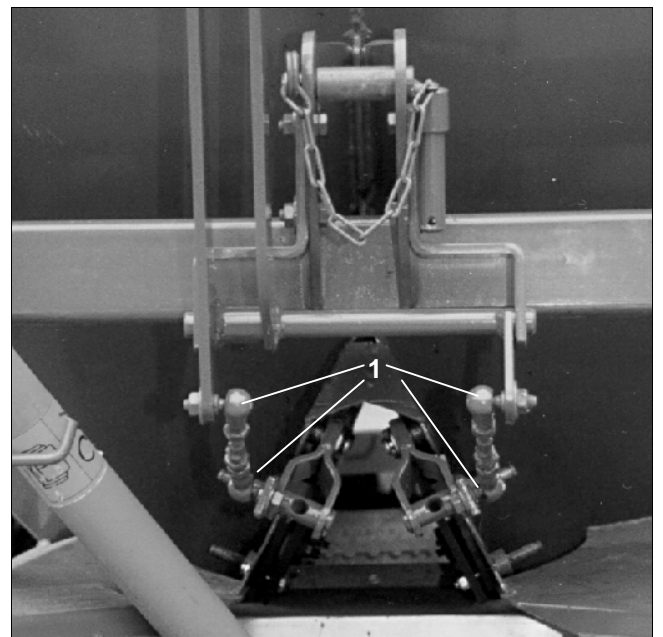


Fig. 9.3

## 9.2.3 Checking the gear box oil level

Under normal conditions the gear box is maintenance-free. The gear boxes are supplied with sufficient oil by the manufacturer **The oil level must be visible in the oil level gauge (9.4/1)**. A refilling of oil normally is not necessary.

External symptoms, e. g. fresh oil spots on the parking place or on machine parts and/or loud noise development, however, indicate an oil leakage of the gear box housing. Search for reason, care for remedy and fill with oil.

**For refilling oil**

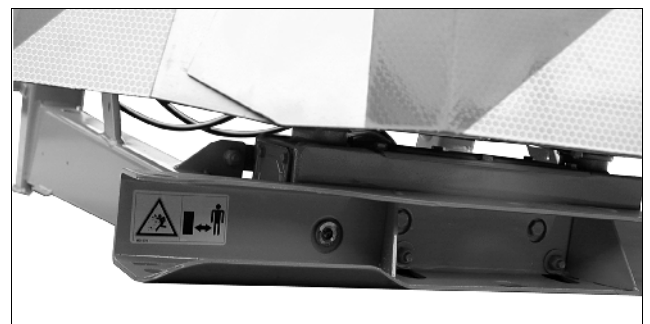


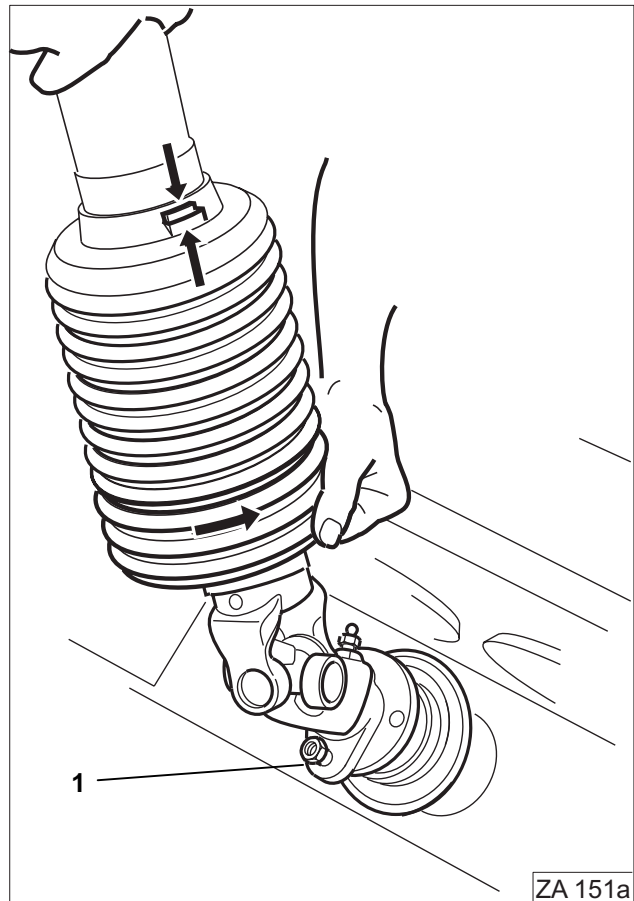
Fig. 9.4

- tilt the spreader to the front,
- refill oil,
- screw in oil level gauge (9.4/1) again.

**Oil filling quantity: 1,6 l SAE 90**

### 9.3 Shear-off safety on the PTO shaft

The separately supplied **bolts 8 x 30, DIN 931, 8.8** are **spare shear bolts (9.5/1)** for fixing the **PTO shaft yoke on the flange of the gearbox input shaft**. Always apply grease when fitting the PTO shaft to the gearbox input shaft.



**Fig. 9.5**

#### 9.4 Checking and correcting the basic setting of the shutter slides

The discharge opening diameter opened with shutter lever position "11" has been factory set with the setting gauge (pin  $\varnothing$  26,5 mm). This ensures an even fertiliser delivery to both spreading discs.

If at equal shutter slide position an uneven emptying of the split hopper is noticed, the shutter slide basic position has to be checked:

- Close shutter slides.
- Set the pointer read off edge (9.6/1) of the setting lever (9.6/2) to the setting figure "11" on the scale (9.6/3) and lock setting lever with the clamping lever (9.6/4).
- Open the shutter slides.
- Now the setting gauge (9.7/1) should easily pass through the opened outlet diameter.

**In case the opening is too narrow or too large, readjust shutter slide basic position as follows:**

- Close shutter slides.
- Slacken the clamp lever.
- Open the shutter slides.
- Insert the setting gauge into the outlet opening.
- Close shutter slides.



**Danger of bruising when closing the shutters.-**

- Swivel the setting lever towards the shutter and lock with the clamping lever.
- Slacken the pointer locking.
- Set the pointer read off edge to the setting figure "11" and lock the pointer in this position on the setting lever.



**If no setting gauge is available the opened outlet opening diameter (9.8/1) can be sight checked. At outlet opening created with shutter slide position "11" the edge (9.8/2) of the shutter slide must intersect the lower corner (9.8/3) of the outlet opening.**

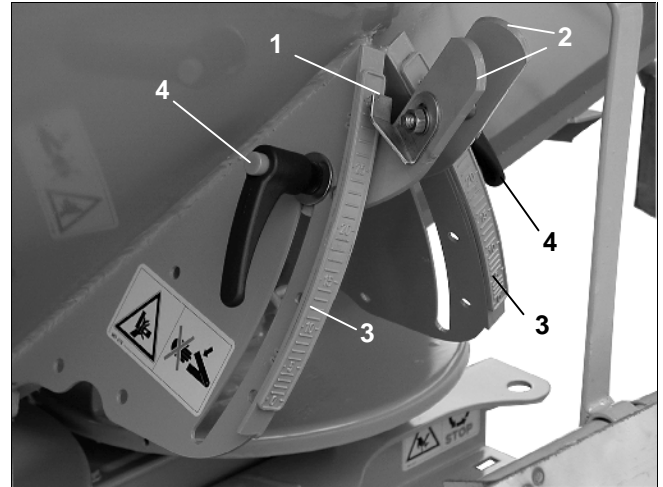


Fig. 9.6

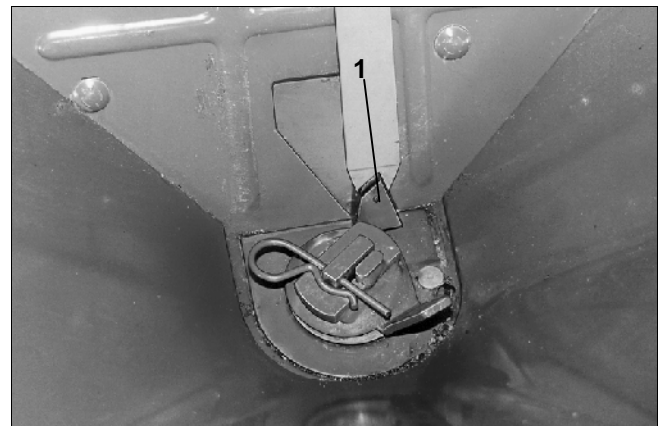


Fig. 9.7

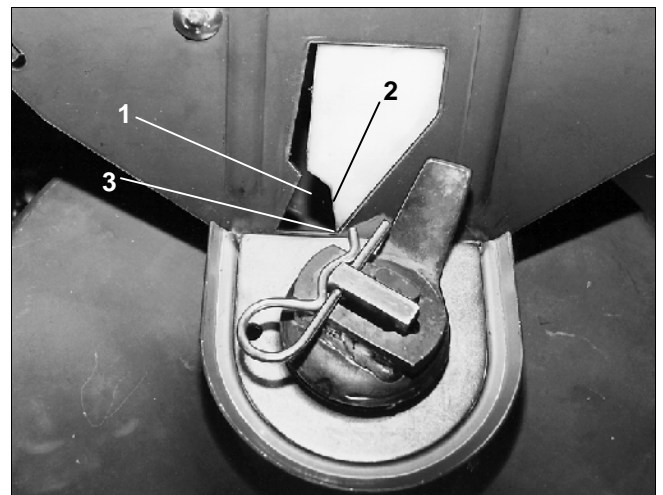


Fig. 9.8



## 9.5 Exchange of spreading vanes



Exchange spreading vanes as soon as breakage by wear can be noted.



Take care when fitting the spreading vanes. The open side of the U-shaped spreading vanes (9.9/1) shows in rotating direction (9.9/2).



Do not mix up the right hand and left hand spreading vanes.



Fit the short vane above the hole (9.9/3) on the disc edge.

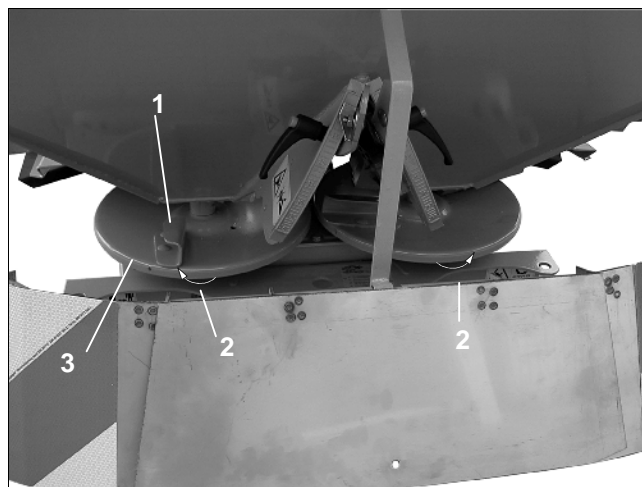


Fig. 9.9

## 9.6 Wear on the hopper bottom

In case of wear the relevant hopper (made from non corrosive material) (Fig. 9.10) can easily be exchanged after having removed the agitator.

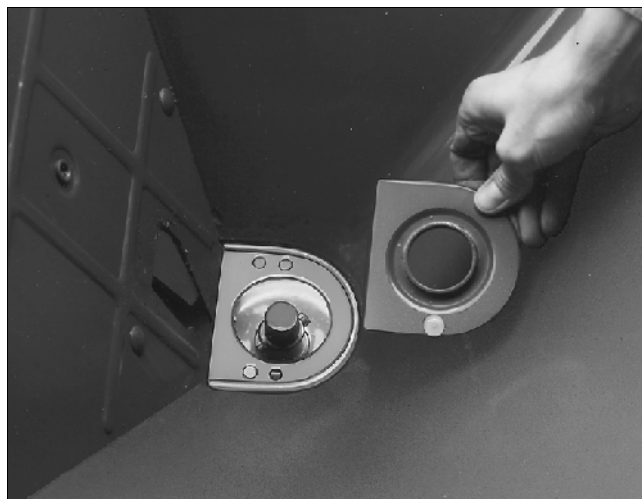


Fig. 9.10

## 10. Setting chart

The table data are indicated in g/m<sup>2</sup>.

Maschineneinstellung	Sand-Splitt-Gemisch (4:1) Loses Schüttgewicht 1,40 kg/l																		mit Rühr- werk	
	Wirksame Streubreite: 3 m						5 m						6 m							
	km/h						km/h						km/h							
	1	6	8	10	12	14	1	6	8	10	12	14	1	6	8	10	12	14		
9	148	25	19	15	12	10	89	15	11	9	7	6	74	12	9	7	6	5		
10	220	37	28	22	18	16	132	22	17	13	11	9	110	18	14	11	9	8		
11	340	57	43	34	28	24	204	34	26	20	17	15	170	28	21	17	14	12		
12	480	80	60	48	40	34	288	48	36	29	24	21	240	40	30	24	20	17		
13	700	117	88	70	58	50	420	70	53	42	35	30	350	58	44	35	29	25		
14	940	157	118	94	78	67	564	94	70	56	47	40	470	78	59	47	39	34		
15	1256	209	157	126	105	90	754	126	94	75	63	54	628	105	79	63	52	45		
16	1600	267	200	160	133	114	960	160	120	96	80	69	800	133	100	80	67	57		
17	1860	310	233	186	155	133	1116	186	140	112	93	80	930	155	116	93	78	66		
18	2120	353	265	212	177	151	1272	212	159	127	106	91	1060	177	133	106	88	76		
19	2280	380	285	228	190	163	1368	228	171	137	114	98	1140	190	143	114	95	81		
20	2460	410	308	246	205	176	1476	246	185	148	123	105	1230	205	154	123	102	88		
21	2600	433	325	260	217	186	1560	260	195	156	130	111	1300	217	163	130	108	93		
22	2800	467	350	280	233	200	1680	280	210	168	140	120	1400	233	175	140	117	100		
23	2940	490	368	294	245	210	1764	294	221	176	147	126	1470	245	184	147	123	105		
24	3080	513	385	308	257	220	1848	308	231	185	154	132	1540	257	193	154	128	110		
25	3220	537	403	322	268	230	1932	322	242	193	161	138	1610	268	201	161	134	115		
26	3340	557	418	334	278	239	2004	334	251	200	167	143	1670	278	209	167	139	119		
27	3460	577	433	346	288	247	2076	346	260	208	173	148	1730	288	216	173	144	124		



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