Centrifugal Broadcaster

AMAZONE ZA-M

premiS novIS maxiS

Operation Manual

MG 612
DB 551.1 (GB) 08.01
Printed in Germany

GB IRL

CE

Before starting to operate, please carefully read and adhere to this operation manual and safety advice.

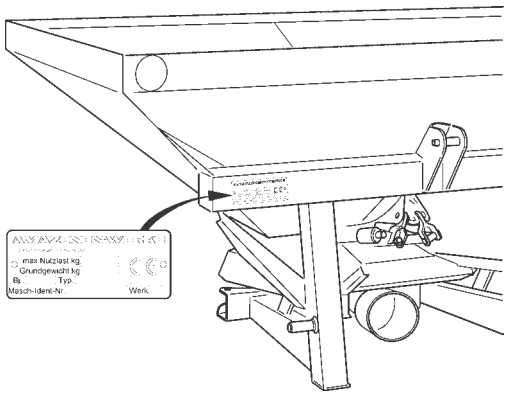
AMAZONE

The centrifugal broadcasters **AMAZONE ZA-M prem*iS*, ZA-M nov*iS*, ZA-M max*iS*** are machines from the comprehensive variety of AMAZONE agricultural machinery and are based on the well known and proven **ZA-M technique**. This operation manual is valid for all three types of broadcasters as the spreading technique is the same.

The mature technique in conjunction with the correct handling provides an optimum and implement saving operation.

We therefore ask you to carefully adhere to this operation manual, as we will not be able to accept claims under guarantee for any damages resulting from incorrect operation.

Please always quote the machine type and serial number when ordering spare parts or making enquiries:



Your broadcater complies only with the regulations of the agricultural health and safety authorities when in the case or repair **original spare parts of AMAZONE** are used for replacement.

Plese carefully read this instruction manual before starting to operate your machine. Especially adhere to the safety advice of the instruction manual and the warning symbols on your machine.

Store and move the centrifugal broadcaster only with empty hopper (otherwise danger of tipping over)!

Contents ..... Page

1.0 Details about the machine

1.1 Manufacturer

AMAZONEN-Werke, H. Dreyer GmbH & Co. KG, P.O. Box 51, D-49202 Hasbergen-Gaste, Germany

1.2 Technical Data

Type	Hopper capacity [liter]	Payload [kg]	Net weight [kg]	Filling height [m]	Filling width [m]	Total width [m]	Total length [m]
ZA-M prem*iS*	1000	2000	265	0,98	2,15	2,30	1,35
+ S 500	1500	2000	293	1,12	2,06	2,30	1,35
+ 2 x S 500	2000	2000	321	1,26	2,06	2,30	1,35
+ L 1000	2000	2000	321	1,25	2,75	2,89	1,35
ZA-M nov*iS*	1500	2000	275	1,12	2,15	2,30	1,35
+ S 500	2000	2000	303	1,26	2,06	2,30	1,35
ZA-M max*iS*	1500	2500	295	1,12	2,15	2,30	1,35
+ S 500	2000	2500	323	1,26	2,06	2,30	1,35
+ 2 x S 500	2500	2500	351	1,40	2,06	2,30	1,35
+ L 1000	2500	2500	351	1,39	2,75	2,89	1,35
+ S 500 + L 1000	3000	3000	379	1,53	2,75	2,89	1,35
Standard execution	Hydraulic single shutter control, filling sieve against foreign particles, collecting bucket for spread rate control, instruction manual, setting chart and disc rule, Walterscheid-pto-shaft						

1.3 Conformity declaration

The centrifugal broadcaster fulfills the requirements of the EC-guide line Machine 89/392/EC and the corresponding additional guide lines.

1.4 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 with the implement OPTAC SLM5.

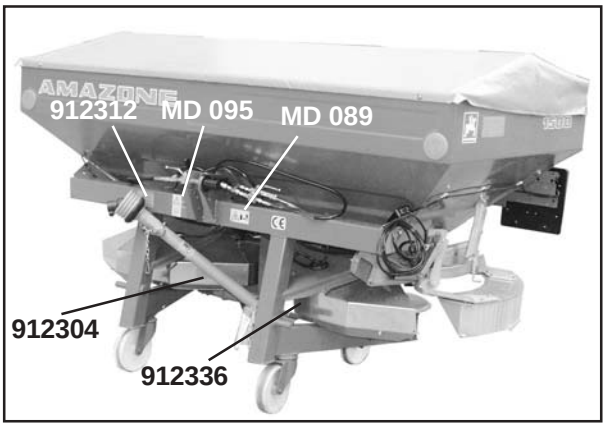


Fig. 2.1

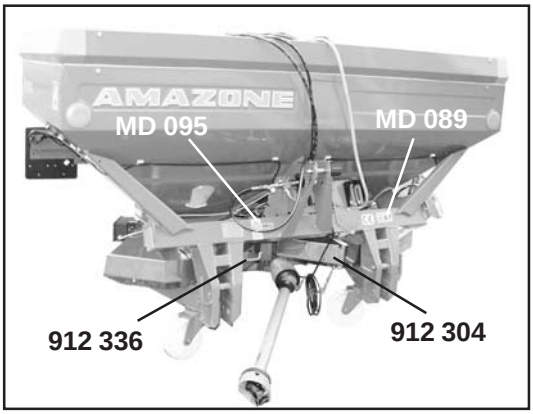


Fig. 2.2

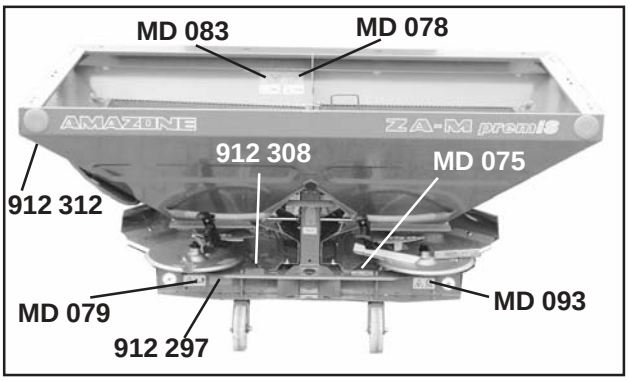


Fig. 2.3

2.0 Important hints

2.1 Safety-/Warning-Symbol

In this operator instruction this symbol is used with all operator safety hints at which life or health of persons is in danger. Please adhere to these hints and be especially careful in such cases. Please pass on all operator safety hints also to other users of this machine. Besides the hints in this operator instruction also the included general safety and accident preventive advice should be adhered to.

2.2 Attention Symbol

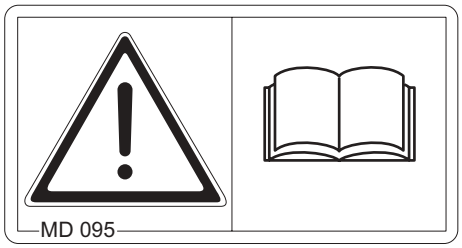
This symbol will always be found in such places of this instruction book which should especially be adhered to in order to comply with rules, advice, hints and the correct procedure of the operation as well as to prevent damage to the implement.

2.3 Hint Symbol

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

2.4 Warning pictographs and hint symbols on the machine

- The warning pictographs indicate dangerous points on the machine. Observing these pictographs means safety for all persons using this machine. The warning pictographs always come together with safety/warning symbols.
- The hint symbols mark machine's specific points which have to be observed to ensure a correct function of the machine..
- Strictly observe all warning pictographs and hint symbols.!
- Please pass on all safety advice also to other users!
- Please always keep all warning pictographs and hint signs clean and in well readable condition. Please ask for replacement of damaged or missing signs from your dealer and attach to relevant place (picture-No.: = Order-No.)!
- Fig. 2.1, Fig. 2.2 and Fig. 2.3 show the fixing points of warning pictographs and hint signs. Please refer to the following pages for relevant explanations.



Picture No.: **MD 095**

Explanation:

Before commencing operation read thoroughly operation manual and safety advice!

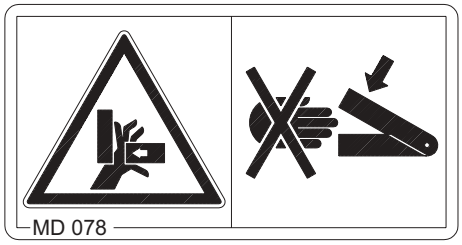
Picture No.: **MD 075**

Explanation:

Do not stay within the zone of spinning spreading discs!

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

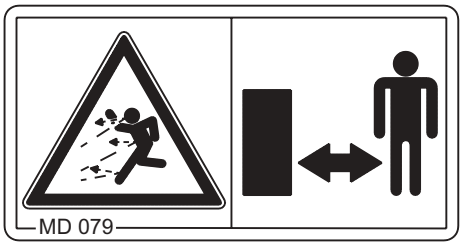
Disengage pto-shaft, stop the engine, and remove the ignition key before exchanging the spreading discs!



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.

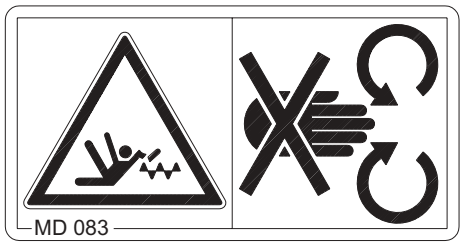


Picture No.: **MD 079**

Explanation:

Danger because of flinging fertilizer particles!

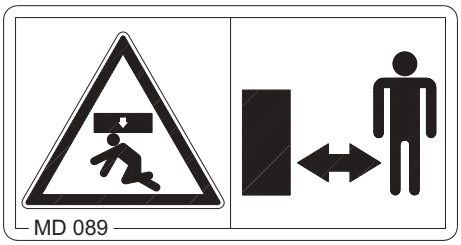
Advise people to leave the danger area.



Picture No.: **MD 083**

Explanation:

Never reach into the rotating agitator spiral!



Picture No.: **MD 089**

Explanation:

Never stay under a lifted fertiliser spreader (unsecured load).

Picture No.: **MD 093**

Explanation:

Danger by rotating machine parts!

Never touch rotating shafts, spreading discs etc.!

Picture No.: **912 297**

(D) **Beim Scheibenwechsel Scheibenloch ø 8 zur Maschinenmitte.**

(F) **En changeant les disques, orientez le trou pré-percé vers la centre de la machine.**

(GB) **Disc change: Hole on disc must face the machine's centre line.**

(NL) **Bij omwisselen van de schijven het got naar het midden van de machine draaien.**

912 297

Picture No.: **912 304**

(D) **Gelenkwellenlänge beachten (sonst Getriebeschaden). Siehe Betriebsanleitung.**

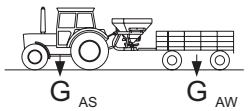
(F) **Veiller impérativement à la longueur de la transmission (risque d'endommagement du boîtier). Voir le manuel d'utilisation.**

(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

Picture No.: **912 308**



1) V_{max} = 25 km/h

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

(D) **Nur zulässig bei Anhängern mit Auflauf- oder Seilzugbremse.**

(F) **Autorisé seulement sur remorque disposant de son propre système de freinage.**

(GB) **Only permissible with trailers which are equipped with over-run or with Bowden cable brakes.**

(NL) **Uitsluitend toegestaan bij aanhangers met oploop-of-kabel-trekrem.**

912 308

Picture No.: **912 312**

(D)

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

(F)

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

(GB)

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

(NL)

1. **Op de vooras ontlasting van de traktor letten.**
2. **Roerdervingers, uitloop-openingen en strooischoepen schoon en bedrijfsgereed houden.**

912 312

Picture No.: **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

2.5 On receipt of the machine

Check that no damage has been caused in transit and all parts are present, otherwise no responsibility can be accepted by us or the carrier. Check whether all parts listed up in the delivery note are present. Any claim must be made within 3 days after receipt of machine.

Before commencing work, remove all packing material, wire, etc. and check that all lubrication points are well supplied with grease, oil, etc. before use (e. g. universal joints)!

Do not reach with your hands into the fertiliser hopper! Danger of injury due to rotating agitator head.

Please check the correct fitting of the spreading discs. Looking into driving direction: left hand spreading disc decal left hand ("links") and right hand spreading disc decal right hand ("rechts").

Please check the correct fitting of the scales on the spreading discs: on the left hand spreading disc the scales are marked with left ("links") and on the right hand spreading disc with right ("rechts"). The scales with the numbers from 60 to 78 belong to the shorter spreading vane and the scales with the numbers of 80 to 95 belong to the longer spreading vanes.

2.6 Declined use of the machine

The centrifugal broadcaster **AMAZONE ZA-M** has exclusively been designed for the usual operation in agriculture for spreading dry, granular, prilled and crystallyne fertilisers as well as for seeds and slug pallets.

The machine is designed to spread on slopes of up to **20 %** inclination.

Any use beyond the one stipulated above is no longer considered as designed use. The manufacturer does not accept any responsibility for damage resulting from this; therefore the operator himself carries the full risk.

Under "designed use" also the adhering to the manufacturer's prescribed operation maintenance and repair conditions as well as the exclusive use of **original AMAZONE spare parts** is to be understood.

The centrifugal broadcaster **AMAZONE ZA-M** may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers.

All applicable accident preventive advice as well as any further generally acceptet safety-, working-, medical- and road-traffic rules and any safety advice on the machines' labels should be adhered to.

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

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

- Varying composition of fertiliser and seed (e. g. granule size distribution, specific density, granule shape, dressing, sealing).
- Drifting.
- Blocking up or bridging (e.g. by foreign particles, bag residue, damp fertiliser etc.).
- undulated terrain.
- Wear of wearing parts (e.g. spreading blades, seed metering wheels, V-belts . . .).
- Damage by external influence.
- Wrong drive-R.P.M. and travelling speed.
- Fitting wrong spreading discs (e.g. mixing them up).
- Wrong setting of the machine (incorrenct mounting, not adhering to the spreading chart).

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

Claims regarding damage not having occured on the AMAZONE centrifugal broadcaster itself will be rejected. This also applies to damages due to spreading errors. Modifications made to the AMAZONE scentrifugal broadcaster by the owner/user may result in damage and therefore the manufacturer does not accept liability for such damage.

3.0 General safety and accident preventive advice

Basic principle:
Always check traffic and operational safety before putting the machine into any operation!

1. Adhere to the general rules of health- and safety precautions as well as to the hints in this instruction manual!

2. The warning- and hint signes fixed to the machine give important hints for the operation without any danger. Adhering to them serves your safety!

3. When making use of public roads adhere to the applicable traffic rules!

4. Become acquainted with all devices and controlling elements as well with their function **before** beginning with the operation. Doing this during operation would be too late!

5. The clothing of the operator should fit tight. Avoid wearing loose clothing!

6. To avoid risk of fire keep the machine clean!

7. Before beginning to drive check surrounding (children). Ensure sufficient visibility!

8. Sitting or standing on the implement during the operation or during transport is not permissible!

9. Mount the implement only with the prescribed tools!

10. Special care should be taken when the implement is coupled to or off the tractor.!

11. When mounting or dismounting bring storing supports in correct position (otherwise danger of tipping over)!

12. Affix any ballast weights always as prescribed to the correct fixing points!

13. Check maximum permissible axle loads of the tractor (see vheicle documents)!

14. Do not exceed maximum permissible transport measurements of the traffic department!

15. Check and fit equipment for road transport, as e. g. traffic lights, warning plates and if existant guards.!

16. The release ropes for quick coupler should hang freely and in the low position must not release the quick coupling by themselves!

17. Never leave tractor seat during driving!

18. 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!

19. When lifting the fertiliser broadcaster the front axle load of the tractor is relieved by different amounts depending on the size of the tractor. Always check that the necessary front axle load of the tractor (20 % of the tractor's net weight) is maintained!

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 stabilize 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! 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.**

23. Filling the fertiliser broadcaster may only be done with a stopped tractor engine, removed ignition key and closed shutters.

24. Do not stay in the rotating- and swivelling range of the implement!

25. Hydraulic folding frames may only be actuated when nobody is staying in the swivelling range!

26. On all hydraulically actuated pivoting parts exists danger of injury by bruising and trapping!

27. Before leaving the tractor lower the implement to the ground. Actuate the parking brakes, stop the engine and remove ignition key!

28. Nobody should stay between tractor and implement if the tractor is not secured against rolling away by the parking brake and/or by chocks!

29. **Note maximum permissible filling loads! Bear in mind the fertiliser bulk density (kg/l). The fertiliser bulk densities can be read off the spreading table resp. have to be determined.**

    Please refer to para. 1.2.

30. If a trailer hitch is provided it must only be used for towing suitable implements or twin axle trailers if:

    - the maximum speed of **25 kph** is not exceeded,
    - the trailer has a run-on brake or a brake which can be actuated from the tractor operator,
    - the permissible total weight of the trailer is not more than **1.25 times** the permissible total weight of the tractor, however, **5 tons** in maximum.

    Single axle trailers must not be towed by tractor mounted machinery under any circumstances.

31. Do not place any foreign objects inside the hopper!

32. During the calibration test watch out for canger zones due to rotating parts of the machine!

33. **Never park or move the fertiliser broadcaster with filled hopper (danger of tipping over).**

34. If the implement is transported over longer distances with filled hopper , closed shutters and out of function (en route to the field), 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 spreading on the spot Only now, after having set the shutters onto the desired spreading rate start spreading .

35. If spreading on field boundaries, waters or roads use the boundary spread deflector!

36. **Before any opereation check perfect seat of fixing parts, especialls for spreading disc- and spreading vane-fixing.**

3.1 Tractor 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-poing linkage the mounting categories on the tractor and the implement must coincide!
3. Within the range of the three-point linkage danger of bruizing and shearing!
4. When actuating the control levers for the three-poing linkage never step between tractor and implement!
5. In transport position always take care for a sufficient lateral locking of the tractors' 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. Check braking systems for function. Mind manufacturer advice!
8. Working implements should only be transported and driven on tractors which are designed to do this!

3.2 Universal joint shaft (pto-shaft)

1. Use only pto shafts which are designed for the implement and which are equipped with all legally requested guards!
2. Guard tubes and cones of the pto shaft as well as a tractor and implement pto guard must be fitted and kept in the correct place.
3. Note the prescribed pto-shaft tube guards in transport- and operating position (refer to operation instruction of the pto shaft manufacturer).
4. Mounting and dismounting pto shaft only with disengaged pto shaft, stopped motor and removed ignition key!
5. Always care for correct fitting and securing of pto shaft!
6. Prevent pto guard from spinning by fixing the provided chains.
7. Before engaging the pto shat 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 refer to details in the spreading chart).

8. Slow engagement of the pto shaft protects tractor and spreader.

9. When using the ground speed related pto shaft note that the speed is related to the forward speed and that the sense of rotation reverses when backing up.

10. Before switching on the pto shaft nobody is allowed to stay in the area of the spinning pto- or universal joint shaft.!

11. Never switch on the tractor pto while the engine is stopped!

12. When operating with the pto shaft nobody is allowed to stay in the area of the spinning pto- or universal joint shaft!

13. Always switch off pto shaft when it is in an adverse position or not needed. Switch off pto shaft as soon as the machine's outlet openings have been shut off.

14. Attention! After switching off the pto shaft the mounted implement may still continue to run by its dynamic masses.

    During this period never come too close to the implement. Begin work only after the implement 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 removed.

16. Deposit removed pto shaft on the provided carrier.!

17. After removal of the pto shaft replace protective cap over the tractor's pto.

18. Remedy of damages is to be undertaken before starting to operate with the implement.

3.3 Hydraulic system

1. Hydraulic system is under high pressure!

2. When connecting hydraulic rams and engines the prescribed connection of the hydraulic hoses has to be noted!

3. When connecting the hydraulic hoses to the tractor's hydraulic take care that the hydraulic is pressureless as well on the tractor- as on the implement side!

4. At hydraulic function connections between tractor and implement, the sockets and plugs should be colour coded in order to avoid misoperation. When mixing up connection, danger of vice versa function, e. g. lifting instead of lowering. **Danger of accident!**

5. The hydraulic hoses should be checked befor the first use and thereafter at least once a year for its operational safety by an expert!

6. When searching for leaks appropriate aids should be used due to danger of injury!

7. Liquids (hydraulic oil) penetrating under high pressure may penetrate the skin and cause severe injuries. In case of injuries immediately see a doctor. Danger of infection!!

8. Before starting to do any repair work on the hydraulic system, lower implement, relieve system from pressure and switch off the engine!

9. The period of use of any hose circuit should not exceed six years including a possible storing period of two years in maximum. Also when stored and used properly, hoses and hose circuits age. Therefore, their longevity and period of use is limited. Deviations from the above may be accepted depending on the experience made and the danger potential. For hoses and hose circuits made of thermoplasts other guide lines may prevail.

3.4 General safety and accident prevention advice for maintenance, repair and cleaning

1. Repair, maintenance- and cleaning operations as well as remedy of function faults should principally be conducted with a stopped drive and engine. Remove ignition key.!

2. Check nuts and bolts regularly (for the first time after 3- 4 hopper fillings) for tightness and retighten if necessary!

3. When doing maintenance work on the lifted implement mnake sure that it is secured by proper supports.!

4. Dispose of oil, grease and filters in the appropriate manner!!

5. Before doing any repair work on the electric disconnect power supply!

6. Before conducting electric welding operations on tractor or on the mounted implement, remove cable from generator and battery.

7. Any spare parts fitted must, in minimum meet with the implement manufacturers' fixed technical standards. This is, for example, ensured by using original **AMAZONE** spare parts.

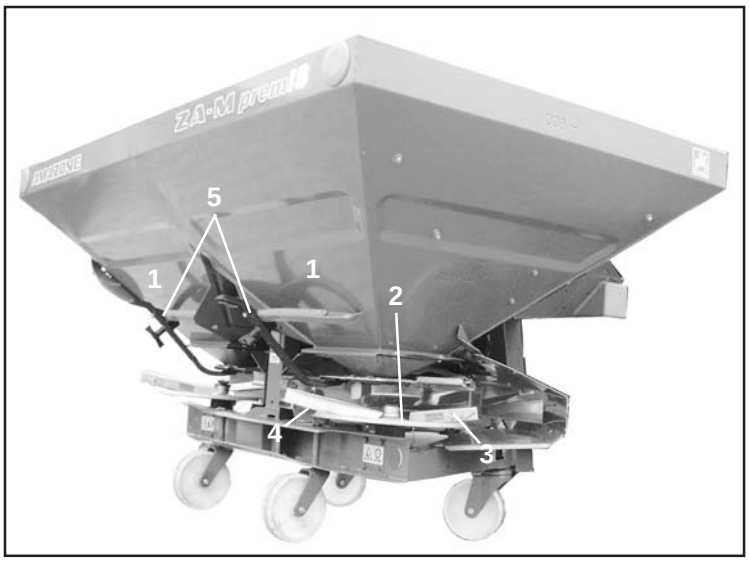


Fig. 4.1

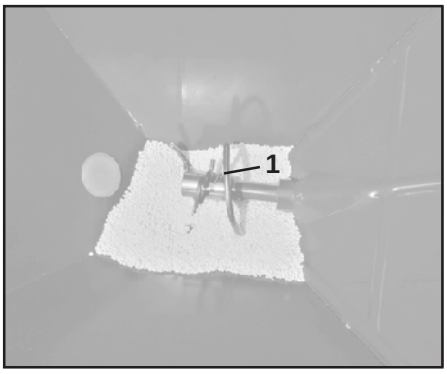


Fig. 4.2

4.0 Centrifugal broadcaster ZA-M

The centrifugal broadcaster **AMAZONE ZA-M** with its two hopper tips (Fig. 4.1/1) can be equipped with the exchangeable "**Omnia-Set**" spreading discs (Fig. 4.1/2) (z.B. OS 20-28). These spreading discs are driven contrary to the operating direction rotating adverse from inside to outside and are equipped with a short (Fig. 4.1/3) and a long spreading blade (Fig. 4.1/4).

Spiral agitators (Fig. 4.2/1) in the hopper tips provide an even fertiliser flow onto the "**Omnia-Set**"-spreading discs. The slowly rotating spiral shaped segments of the agitator guide the fertiliser evenly to the corresponding outlet opening.

The spread rate is set by setting levers (Fig. 4.1/5)by setting varying shutter opening widths. The required setting number on the scale is either taken from the **setting chart** or determined with the aid of the **disc rule**. As the fertiliser spreading properties may vary considerably it is recommended to check the chosen lever position for the desired spread rate by means of a spread rate control. The opening and closing of the shutter slide opening is achieved by an additional shutter hydraulically (closing) or by a tensioning spring (opening).

Setting the various working widths between **10 and 36 m** is done by swivelling the spreading vanes on the **"Omnia-Set"** spreading discs. These different settings of the steplessly swivellable spreading blades are compiled in the **setting chart**. Checking the set working width is simply done with the mobile working width test kit.

The following pairs of "Omnia-Set" spreading discs are available to obtain the desired working widths:

• OS 10-12 • OS 10-18 • OS 20-28 • OS 30-36

When spreading with OS 30-36 your fertiliser spreader has to be equipped with guard tube (accident prevention)!

Border spread discs **"Tele-Set"** (option)

- TS 5-9 (for distances from 5 to 9 m to field's boundary)
- TS 10-14 (for distances from 10 to 14 m to field's boundary)
- TS 15-18 (for distances from 15 to 18 m to field's boundary)

enables a fertilising alongside the field's boundary as prescribed by the draft of a fertiliser decree.

If the first tramline has been created on half the working width from the field's side, the border can be spread remote controlled with the aid of the Limiter M (special option).

If the first tramline has been created directly on the field's side, the boundary spread limiter (special option) for one-sided spreading to the field's border is used.

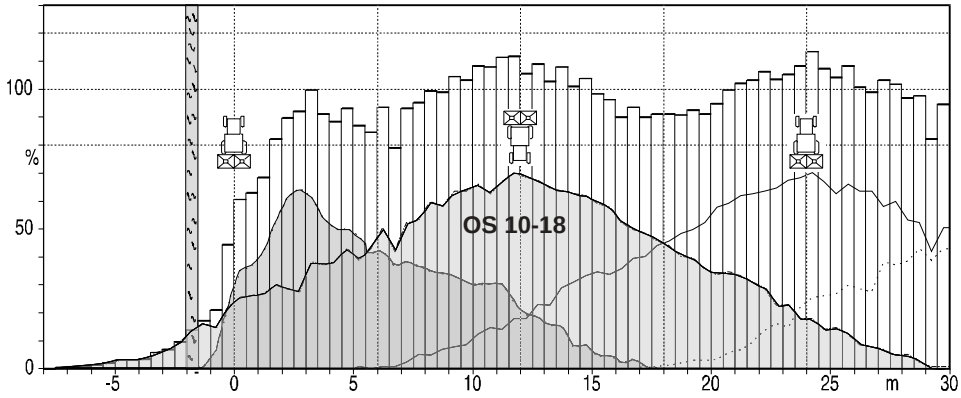


Fig. 4.3

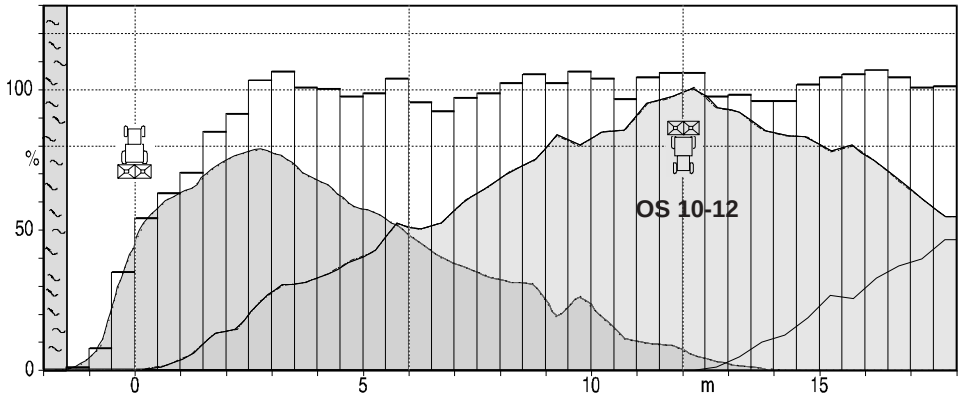


Fig. 4.4

4.1 Remarks on spreading discs OS 10-12 and OS 10-18

The spreading discs **OS 10-12** have been developed for customers who

- have created tramlines in spacings of 10 resp. 12 m (Fig. 4.3 and 4.4).
- have problems when spreading alongside the field's boundary.
- reject multiple overlapping with OS 10-18.

The throwing width of the **OS 10-12** is approx. 24 m, i. e. double overlapping at 12 m.

With the **OS 10-18** the throwing width is approx. 36 m (see Fig. 4.4) resulting in large overlapping areas at 15, 16 and 18 m working width being favourable for an even fertiliser application. At 10 and 12 m this large spreading width may be of disadvantage, especially when using the boundary spread deflector.

Thus, e. g. boundary spreading (with boundary spread deflector) is recommended for a distance of 1.5 m with 18 m tramline spacing, as no fertiliser is thrown beyond the field's boundary. If, however, with the same spreading vane position (at some kinds of fertiliser, e. g. KAS, it is possible to achieve with the same spreading vane position an optimum lateral distribution at 10-18 m working width) a tramline spacing of 12 m or 10 m is covered, the **OS 10-18** throw considerable fertiliser quantities (approx. 4.5 to 6.5 m) beyond the boundaries when travelling back (see Fig. 4.3).

As according to the fertiliser decree fertilising beyond the field's boundary is prohibited, for the above mentioned purposes adhering to this draft is only possible by using the **OS 10-12** (see Fig. 4.4).

When using the border spread disc TS 5-9 at 5 m distance to the boundary, the **OS 10-18** also throws approx. 3 m beyond the field's boundary so that also here the use of **OS 10-12** is necessary.

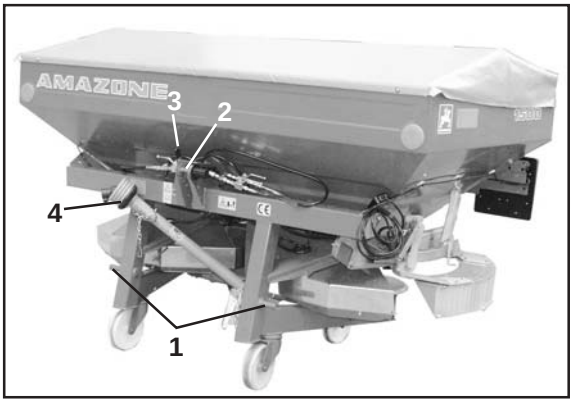


Fig. 5.1

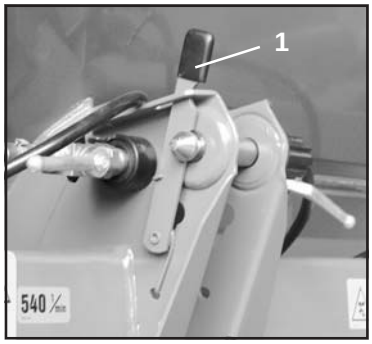


Fig. 5.1 a

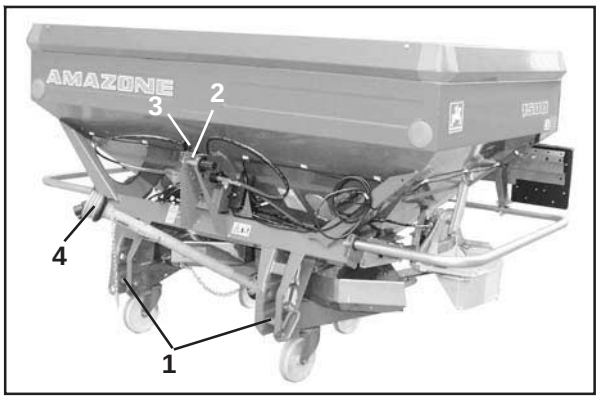


Fig. 5.2

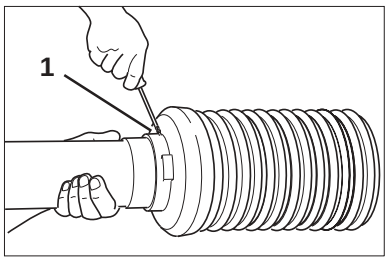


Fig. 5.3

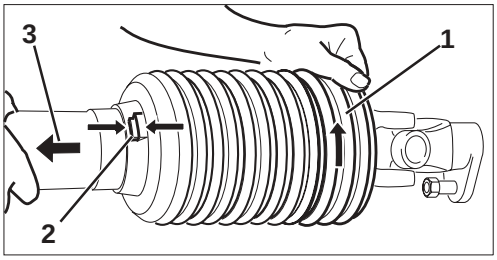


Fig. 5.4

5.0 Mounting to the threepoint linkage

Mount your centrifugal broadcaster to the rear hydraulic threepoint linkage of the tractor (herefore please note para. 3.1).

- Fix lower link of tractor on lower link pin (cat. II) (Fig. 5.1/1 resp. 5.2/1) and secure with clip pin. On the ZA-M max*iS* insert the pin into the upper hole of the lower link console. As standard this lower link console is equipped with a second lower link connection and allows a 120 mm higher mounting to the tractor (e. g. for late top dressing).
- Fix upper link with link pin (cat. II) (Fig. 5.1/2 resp. 5.2/2) and secure. **Hereby arresting lever (Fig. 5.1/3 resp. 5.2/3 and 5.1a/1) must have caught.**

When parking the broadcaster always place it on level ground. Do not lift it infront (Danger of tipping over) !

Ask people to leave the danger zone behind or underneath the machine, as it may swing to the rear and down if the upper link halves erroneously are twisted apart resp. tear off.

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

In lifted position the lower link arms of the tractor must only have little play to the sides, so that the machine does not swing to and fro during spreading operation. Secure lower link arms of the tractor with stabilising bars or chains.

5.1 Pto-Shaft

Only use the pto shaft recommended by the manufacturer.

In case the shear bolt between connecting yoke- and drive input shaft flange continue to fail and on tractors with a hydraulically actuated universal joint shaft, the Walterscheid pto shaft with friction clutch (K94/1) is recommended (option).

5.1.1 Fitting and matching of the pto shaft

The pto-shaft must first be fitted to the empty and parked broadcaster.

Fitting the pto shaft

- Remove fixing bolt (Fig. 5.3/1).
- Twist cone (Fig. 5.4/1) into fitting position (Fig. 5.4/2).
- Pull off (Fig. 5.4/3) protective half.
- Tilt machine to the rear.

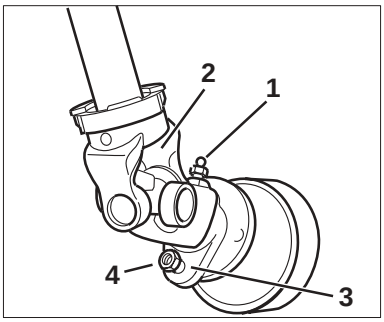


Fig. 5.4a

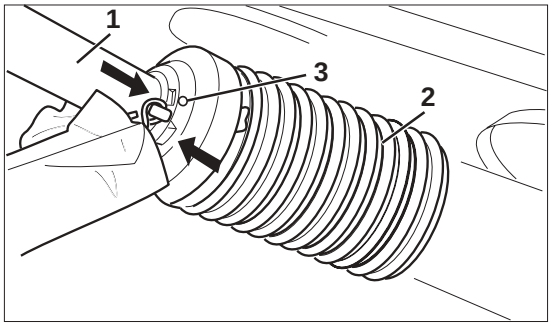


Fig. 5.4b

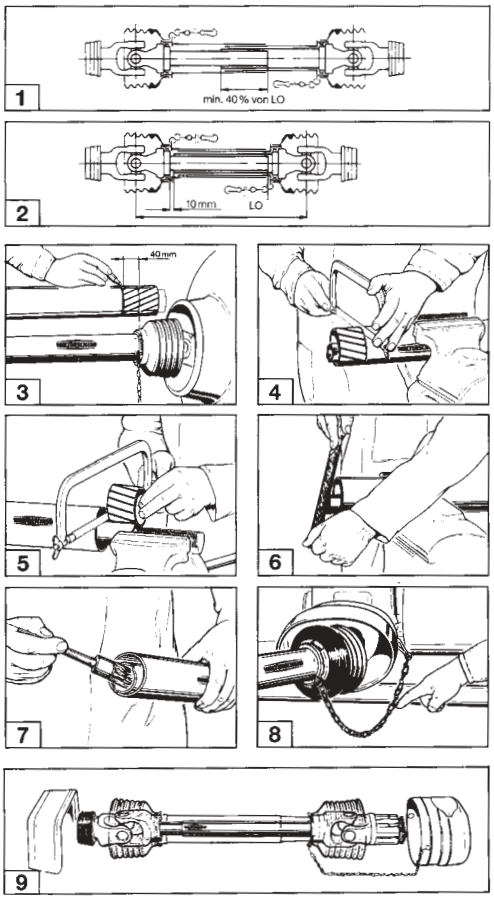


Fig. 5.5

Before fitting to input shaft clean drive input shaft on the machine and apply grease to the pto shaft! (Corrosion on the input shaft can prevent the shear bolt to shear off when it should).

- Slacken grease nipple (5.4a/1) and push on pto shaft (5.4a/2).
- Affix connecting yoke (5.4a/3) with shear bolt (5.4a/4).
- Tighten grease nipple (5.4a/1).
- Push on protection half (5.4b/1) and twist guard cone (5.4b/2) into fitting position.
- Screw in lock bolt (5.4b/3).
- Tilt machine to the front.

Matching the pto shaft when fitted for the first time

When fitting for the first time, match pto shaft to tractor according Fig. 5.5. As this matching only applies for this very type of tractor, check pto shaft matching when changing tractors resp. repeat it.

When first mounting fix other pto shaft half to the universal joint shaft profile of the tractor without inserting the pto shaft tubes into one another.

1. By holding the two pto shaft tubes side by side, check whether an overlap of the pto shaft tubes of **at least 40 % of L0** (L0 = length in inserted condition) is guarantied as well on the lowered as on the lifted broadcaster.
2. In inserted position the pto shaft tubes may not touch the yokes of the universal joint. A **safety margin of at least 10 mm** should be attained.
3. For matching the length of the pto shaft halves hold them side by side in the closest operating position of the machine and mark.
4. Shorten inner and outer guard tube by the same amount.
5. Shorten inner and outer profile tube in the same length as guard tube.
6. Debur cutting edges and carefully remove chips.
7. Apply grease to the profile tubes and insert.
8. Hook in chaines into the hole of the bracing of the upper link pocket so that a sufficient swivel range of the pto shaft in all operating positions is guaranteed and the pto shaft guard is prevented from rotating during operation.
9. **Only operate with entirely guarded drive.**

On tractor and implement only use pto shaft with complete guard and additional guard. Replace guards immediately once they have been damaged.

The maximum pto shaft angle must never exceed 25 degrees.

Also note the fitting- and maintenance advice of the pto shaft manufacturer!

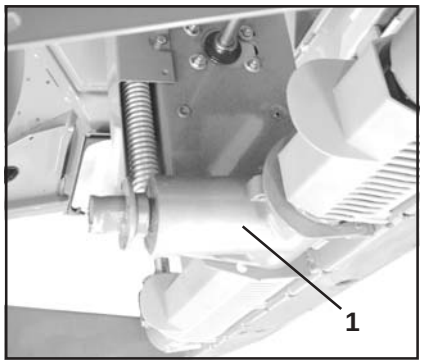


Fig. 5.6

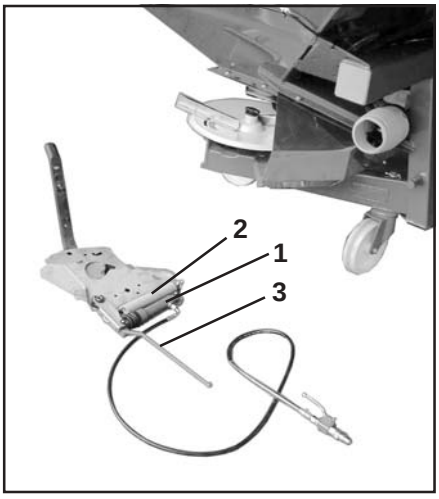


Fig. 5.7

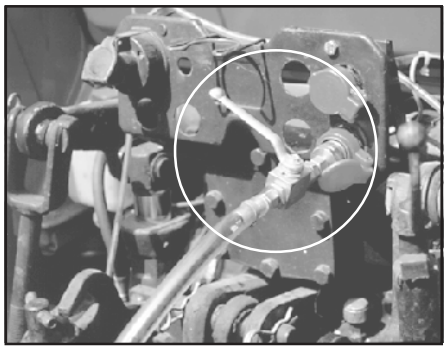


Fig. 5.8

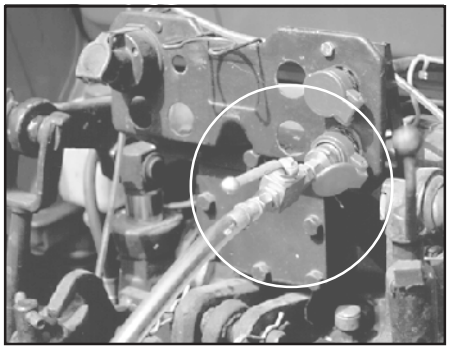


Fig. 5.9

To avoid damages only engage pto shaft slowly at low tractor engine speed (idling).

When parking the fertiliser spreader, the pto shaft should be placed into catching hooks provided (Fig. 5.1/4 resp. 5.2/4).

5.1.2 Centre gear box with giving-way safety

To protect the spreader from damage (at the first mounting) (e.g. by a not properly matched pto shaft) it is equipped with the resilient centre gearbox (Fig. 5.6/1).

5.2 Hydraulic single shutter control

In order to avoid damages on the broadcaster the pressure in the tractor hydraulic system must not exceed 230 bar.

The hydraulic hoses are connected to two single acting control valves on the tractor. For shutting the shutters set control valve to "lift" and for opening to "lower". On tractors with only one single acting control valve the connection is done with the aid of a two-way connecting hose unit (option).

For half-side spreading the shutters can be actuated independently of one another by single acting hydraulic rams.The opening is shut by the shutter via the hydraulic ram (Fig. 5.7/1) and opened by spring action (Fig. 5.7/2) .The position of the red rods (Fig. 5.7/3) indicate, whether the shutters are open or closed. **If the rod is driven out the shutter is open.**

In case of leaking control valve and/or longer periods of standstill, e. g. during road transport, shutting the lock taps prevent the closed shutters from opening by themselves.

Fig. 5.8 Lock tap closed.
Fig. 5.9 Lock tap opened.

6.0 En route to the field - Transport on public roads

When moving the broadcaster mounted to a tractor on public roads, observe the traffic regulations in force in your country. According to the harmonised European traffic regulations traffic light units and warning plates (red/white) are required on agricultural and forestry implements mounted to tractors. Vehicle owner as well as the operator are responsible for adhering to the legal traffic regulations (slight national differences may be possible). In general they are :

- If the prescribed rear lights, the direction blinkers or the registration No. of the tractor are hidden by the broadcaster (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 tractor, extra parking warning plates and limiting lights are required. If the mounted implement protrudes more than 1 m beyond the tail lights of the tractor, 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 the manufacturer of the implement resp. from your dealer directly. As always the latest edition of the national traffic regulations is valid, please verify them at your local traffic office (please refer also to para 10.11).

- Lift the tractor mounted broadcater only so far that the upper edge of the rear lights is in maximum 900 mm above the road.

- Check traffic light kit for proper function.

- **Note maximum permissible filling loads (also refer to para. 1.2) and axle loads of tractor; if necessary drive on public roads with only half filled hopper.**

When lifting the fertiliser broadcaster the front axle load of the tractor is relieved by different amounts depending on the size of the tractor. Always check that the necessary front axle load of the tractor (20 % of the tractor's net weight) is maintained!

- If a trailer hitch is provided it must only be used for towing implements or twin axle trailers if:

  - the maximum speed of 25 kph is not exceeded,.

  - the trailer has a run-on brake or a brake which can be actuated from the tractor operator.

  - the permissible total weight of the trailer is not more than 1.25 times the permissible total weight of the tractor, however, 5 tons in maximum.

Single axle trailers must not be towed under any circumstances.

- Do not exceed maximum permissible transport width (within Europe 3 m) according to the traffic law of your country.

When driving on poublic roads with lifted implement the control lever has to be locked against unintended lowering.

In case of leaking control valves and/or longer pauses, e. g. transports, the shutting of the block ball taps prevents a self-opening of the closed shutter slide (herefore please note para. 5.2).

Please adhere to these advices. They help to prevent accidents in public traffic.

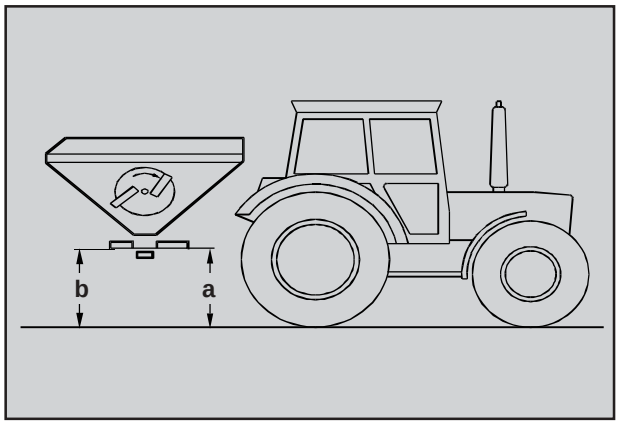


Fig. 7.1

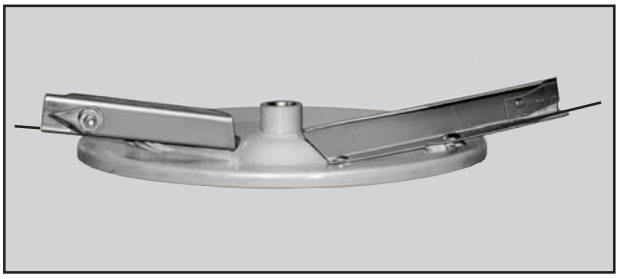


Fig. 7.2

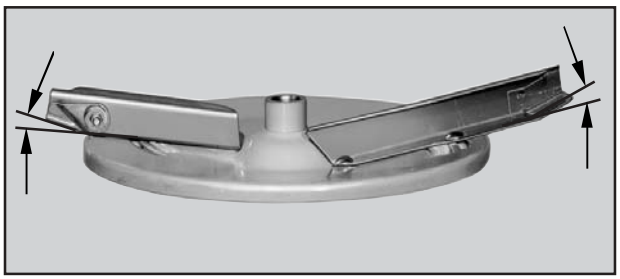


Fig. 7.3

7.0 Setting and use of the fertiliser spreader

For all settings on the centrifugal broadcaster **AMAZONE ZA-M** follow the indications of the **setting chart**.

All common fertilisers are test-spread in the **AMAZONE**-test hall and the hereby determined setting figures are entered into the setting chart. All fertilisers mentioned in the setting chart were in excellent condition when determining the setting values.

Due to varying fertiliser characteristics because of weather influence and/or unfavourable storing conditions, deviations of the physical properties of the fertiliser - also within the same kind and brand - the spreading behaviour of the fertiliser may change and thus deviations from the figures for setting the desired spread rate or working width in the setting chart may become necessary. No guarantee can be given that your fertiliser - even with the same name and from the same manufacturer - has the same spreading behaviour as the fertiliser tested by us.

The figures in the setting chart can only be taken as standard. Therefore, always conduct a spread rate check.

With unknown kinds of fertiliser or for a checking of the working width set, a working width check can easily be conducted with the mobile test kit (option).

When spreading with your fertiliser broadcaster use the foldable filling sieve against foreign particles.

7.1 Setting the mounting height

Ask people to leave the danger zone behind or underneath the machine, as it may swing to the rear and down if the upper link halves erroneously are twisted apart resp. tear off.

Set the mounting height of the filled broadcaster in the field exactly according to the figures given in the setting chart . Measure the distance between soil surface and the spreading disc front- and rear side (Fig. 7.1).

7.1.1 Normal fertilising

The indicated mounting height, normally level 80/80 cm, are valid for the normal fertilising. **For normal fertilising the swivel blades of the spreading discs are normally in the lowered position** (Fig. 7.2) (Please adhere to advice in the setting chart).

For the spring spreading season, when the crop has grown up to **a height of 10-40 cm**, **one half of the crop height should be added to the stated mounting heights (e. g. 80/80).** Thus set a **mounting height of 95/95** when the **crop is 30 cm tall**. If the crop stands taller follow the instructions for late top dressing (para. 7.1.2). If the crop stands very dense (rape) the fertiliser broadcaster should be set at 80/80 **above** the crop. If that is no longer possible, then please also follow the instructions for late top dressing (para. 7.1.2).

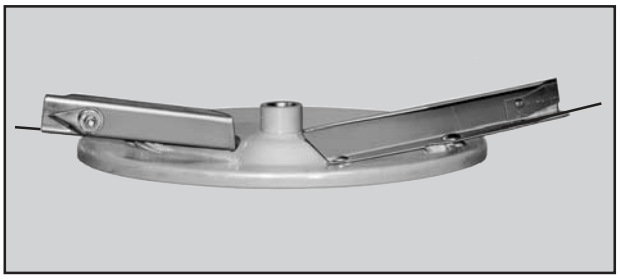


Fig. 7.2

Fig. 7.3

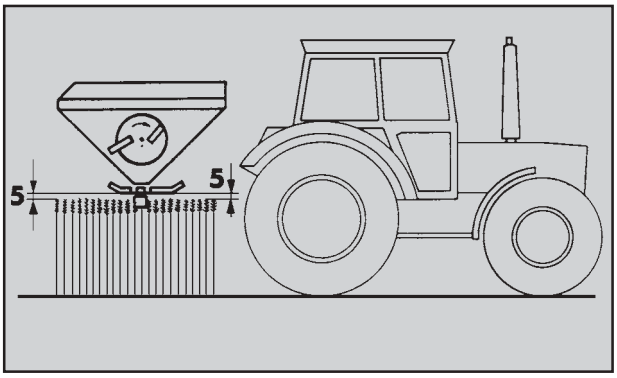


Fig. 7.4

7.1.2 Late top dressing

The spreading discs are supplied as standard with spreading vanes by which besides the normal spreading procedure also late top dressing in crops to growth height of 1 m may be conducted **without** any further option.

For late top dressing swivel upwards the swivel blades of the spreading vanes without slackening the nuts (without tools) into the upper position (Fig. 7.3). Hereby the fertiliser spread fan is raised.

Set the mounting height of the spreader with the aid of the tractor's three-point-hydraulic that high that the distance between top of the grain and spreading discs is **approx. 5 cm** beträgt (Fig. 7.4). If necessary insert the lower link pins into the lower lower link pin connections (only possible with the ZA-M max*iS*).

In case the pto-shaft universal joint exceeds angles of 25° use a wide angle pto shaft (option).

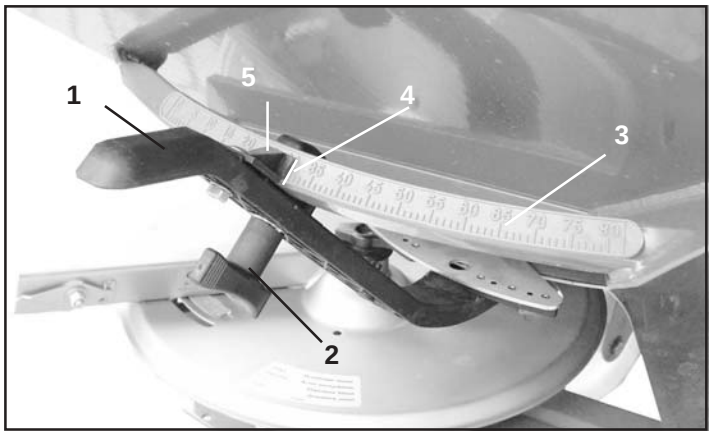


Fig. 7.5

7.2 Setting the spread rate

Set the spread rate with the mounted machine, disengaged drive and closed shutters.

The **shutter slide position** for the desired **spread rate** is set with the aid of the two setting levers (7.5/1).

Take the **required shutter slide position either directly from the setting chart or determine with the aid of the calculating disc rule.**

The setting figures of the setting chart may only be considered as standard data. The flowing properties of the fertiliser may change and thus require other settings. Therefore always carry out a spread rate check before commencing the spreading work.

The determination of the shutter slide position with the aid of the calculating disc rule is carried out after a spread rate check. This way the varying flowing properties of the fertiliser are already considered when determining the shutter slide position.

7.2.1 Setting the shutter slide position with the aid of the setting levers

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

Choose the same shutter slide positions for the right hand and the left hand shutter!

KAS 27 % N BASF; PCK; Hydro; DSM; Kemira; Agrolinz	1,02 kg/l
KAS 27 % N SCHZ; NET; Landor	1,04 kg/l
NP- und NPK-Sorten BASF; Agrolinz; SCHZ	1,10 kg/l
NPK-Sorten Kemira	1,04 kg/l
NPK 15-7-11+10 / 10-8-17+3+9+0,3 TIMAC	1,00 kg/l
Patador; Ceral Agroline	1,06 kg/l
Nitroplus; Polyvalent Landor	1,03 kg/l
Korn-Kali ® mit 6 % MgO KAMEX 'gran.' 40/6 K+S	1,12 kg/l

Schieberstellung	20 km/h			21 km/h			24 km/h			27 km/h			28 km/h		
	8	10	12	8	10	12	8	10	12	8	10	12	8	10	12
25	135	108	90	128	103	86	112	90	75	100	80	67	96	77	64
26	150	120	100	143	115	95	125	100	84	111	89	74	107	86	72
27	167	133	111	159	127	106	139	111	93	124	99	82	119	95	79
28	184	147	123	175	140	117	154	123	102	136	109	91	132	105	88
29	203	162	135	193	154	129	169	135	113	150	120	100	145	116	96
30	222	178	148	211	169	141	185	148	123	164	131	110	158	127	106
31	242	194	161	231	184	154	202	161	134	179	143	120	173	138	115
32	263	210	175	251	200	167	219	175	146	195	156	130	188	150	125
33	285	228	190	271	217	181	237	190	158	211	169	141	203	163	136
34	307	246	205	293	234	195	256	205	171	228	182	152	220	176	146
35	331	265	220	315	252	210	276	220	184	245	196	163	236	189	157
36	355	284	236	338	270	225	296	236	197	263	210	175	253	203	169
37	379	303	253	361	289	241	316	253	211	281	225	187	271	217	181
38	404	323	270	385	308	257	337	270	225	299	240	200	289	231	193
39	430	344	287	409	328	273	358	287	239	318	255	212	307	246	205
40	456	365	304	434	348	290	380	304	253	338	270	225	326	261	217
41	483	386	322	460	368	306	402	322	268	358	286	238	345	276	230
42	510	408	340	485	388	324	425	340	283	377	302	252	364	291	243
43	537	430	358	511	409	341	447	358	298	398	318	265	383	307	256
44	564	451	376	537	430	358	470	376	313	418	334	279	403	322	269
45	592	473	395	564	451	376	493	395	329	438	351	292	423	338	282
46	620	496	413	590	472	393	516	413	344	459	367	306	443	354	295
47	647	518	432	617	493	411	540	432	360	480	384	320	462	370	308
48	675	540	450	643	514	429	563	450	375	500	400	333	482	386	322
49	703	562	469	670	536	446	586	469	391	521	417	347	502	402	335
50	731	584	487	696	557	464	609	487	406	541	433	361	522	417	348
51	758	606	505	722	578	481	632	505	421	561	449	374	541	433	361
52	785	628	523	748	598	498	654	523	436	582	465	388	561	449	374
53	812	650	541	773	619	515	677	541	451	601	481	401	580	464	387
54	838	671	559	798	639	532	699	559	466	621	497	414	599	479	399

M-KAS12.ms

Excerpt from setting chart

Fig. 7.6

7.2.2 Take the shutter slide position from the setting chart

The shutter slide position depends on

- the kind of fertiliser to be spread.
- the working width [m].
- the speed of operation [km/h].
- the desired spread rate [kg/ha].

Example:

Kind of fertiliser:	**CAN 27 % N prilled BASF**
Working width:	**24 m**
Speed of operation:	**10 km/h**
Desired spread rate:	**350 kg/ha**
Shutter slide position:	**?**

- Find in the setting chart the pages **Shutter slide position for the spread rates for mineral fertiliser CAN** (Fig. 7.6).
- Find among the columns with the working width **24 m** the column **10 km/h**.
- Find in column **10 km/h** the spread rate **358 kg/ha**.
- In the same line read off the shutter **slide position 43** for **358 kg/ha**.
- Set the shutter slide position with the aid of the setting levers on to the scale figure **43** as described.

We recommend to carry out a spread rate check with this shutter slide position.

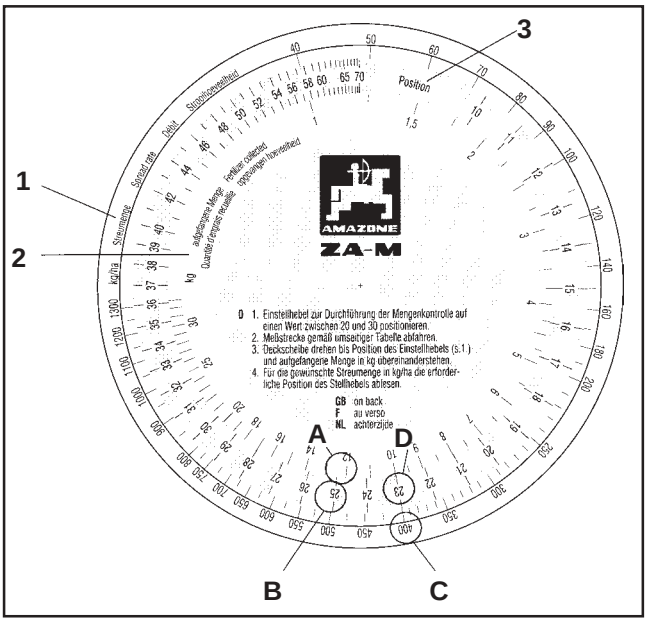

1
2
3
A
B
C
D
Position
AMAZONE
ZA-M
D 1. Einstellhebel zur Durchführung der Mengenkontrolle auf einen Wert zwischen 20 und 30 positionieren.
2. Meßstrecke gemäß umseitiger Tabelle abfahren.
3. Deckscheibe drehen bis Position des Einstellhebels (s.1.) und aufgefangene Menge in kg übereinanderstehen.
4. Für die gewünschte Streumenge in kg/ha die erforderliche Position des Stellhebels ablesen.
GB on back
F au verso
NL achterzijde

Fig. 7.7

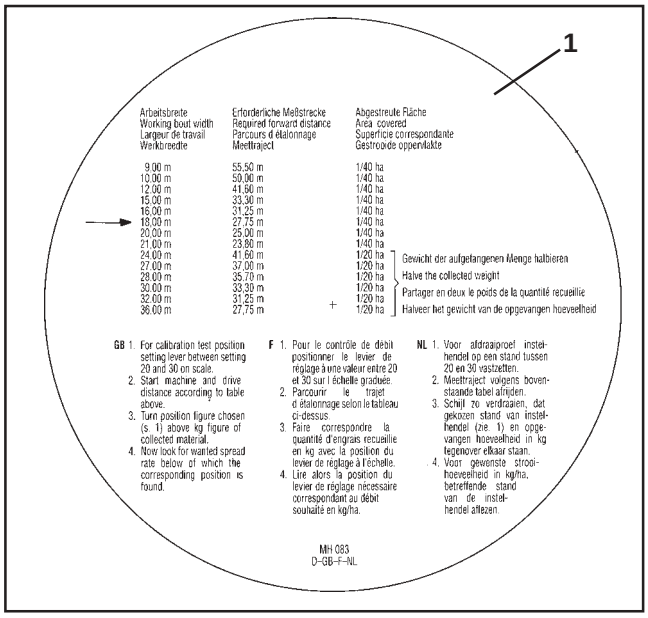

1
Arbeitsbreite
Working bout width
Largeur de travail
Werkbreedte
Erforderliche Meßstrecke
Required forward distance
Parcours d étalonnage
Meettraject
Abgestreute Fläche
Area covered
Superficie correspondante
Gestrooide oppervlakte
9.00 m 55.50 m 1/40 ha
10.00 m 50.00 m 1/40 ha
12.00 m 41.60 m 1/40 ha
15.00 m 33.30 m 1/40 ha
16.00 m 31.25 m 1/40 ha
18.00 m 27.75 m 1/40 ha
20.00 m 25.00 m 1/40 ha
21.00 m 23.80 m 1/40 ha
24.00 m 41.60 m 1/20 ha
27.00 m 37.00 m 1/20 ha
28.00 m 35.70 m 1/20 ha
30.00 m 33.30 m 1/20 ha
32.00 m 31.25 m 1/20 ha
36.00 m 27,75 m 1/20 ha
Gewicht der aufgefangenen Menge halbieren
Halve the collected weight
Partager en deux le poids de la quantité recueillie
Halveer het gewicht van de opgevangen hoeveelheid
GB 1. For calibration test position setting lever between setting 20 and 30 on scale.
2. Start machine and drive distance according to table above.
3. Turn position figure chosen (s. 1) above kg figure of collected material.
4. Now look for wanted spread rate below of which the corresponding position is found.
F 1. Pour le contrôle de débit positionner le levier de réglage à une valeur entre 20 et 30 sur l échelle graduée.
2. Parcourir le trajet d étalonnage selon le tableau ci-dessus.
3. Faire correspondre la quantité d engrais recueillie en kg avec la position du levier de réglage à l échelle.
4. Lire alors la position du levier de réglage nécessaire correspondant au débit souhaité en kg/ha.
NL 1. Voor afdraaiproef instelhendel op een stand tussen 20 en 30 vastzetten.
2. Meettraject volgens bovenstaande tabel afrijden.
3. Schijf zo verdraaien, dat gekozen stand van instelhendel (zie. 1) en opgevangen hoeveelheid in kg tegenover elkaar staan.
4. Voor gewenste strooihoeveelheid in kg/ha, betreffende stand van de instelhendel aflezen.
MH 083
D-GB-F-NL

Fig. 7.8

7.2.3 Determine the shutter slide position with the aid of the calculating disc rule

The calculating disc rule consists of:

Fig. 7.7/...

1 - The outer white scale with the spread rates [kg/ha] (spread rate).
2 - The inner white scale for the amount of fertiliser [kg] collected during the calibration test (collected amount) .
3 - The centre coloured scale with the shutter slide positions (Position).

Fig. 7.7/...

1 - The table for determining the required test distance [m].

Example:

Working width:	**18 m**
Spread rate:	**400 kg/ha**
Speed of operation:	**10 km/h**
Shutter slide position:	**?**

- Set on the left hand setting lever a mean shutter slide position, e. g. **25**.
- For the desired working width **18 m** read off table **(7.8/1)** the required test distance **27,75 m**.

At the spread rate check the area spread is

- **for working widths up to 21 m 1/40 ha.**
- **for working widths up to 24 m 1/20 ha.**

- Carefully measure a test distance in the field. Mark beginning and end of the test distance.
- Convert the broadcaster to the spread rate check (see para.7.3).
- Carry out a calibration test.
  - Carefully drive test distance from beginning to end mark under field conditions, e. g. with the intended constant forward speed of **10 km/h** and a spread rate speed of **720 min^{-1}** (unless otherwise stated for the working width setting in the setting chart). Open the left hand shutter exactly on the beginning of the test distance and shut it at the end point.
- Weigh the collected amount of fertiliser, e. g. **12,5 kg**.

For working widths of more than 24 m halve the collected amount of fertiliser (e.g. 25 kg = 25 kg/2 = 12,5 kg) and determine the shutter slide position with this figure.

- Take the calculating disc rule. On scale **(7.7/2)** for collected quantity [kg] look for figure **12,5 (7.7/A)** and align with the chosen shutter slide position (Position) **25 (7.7/B)** on the coloured scale **(7.7/3)**.
- Look for desired spread rate **400 kg/ha (7.7/C)** and read off the required shutter slide position (Position) **23 (7.7/D)**.

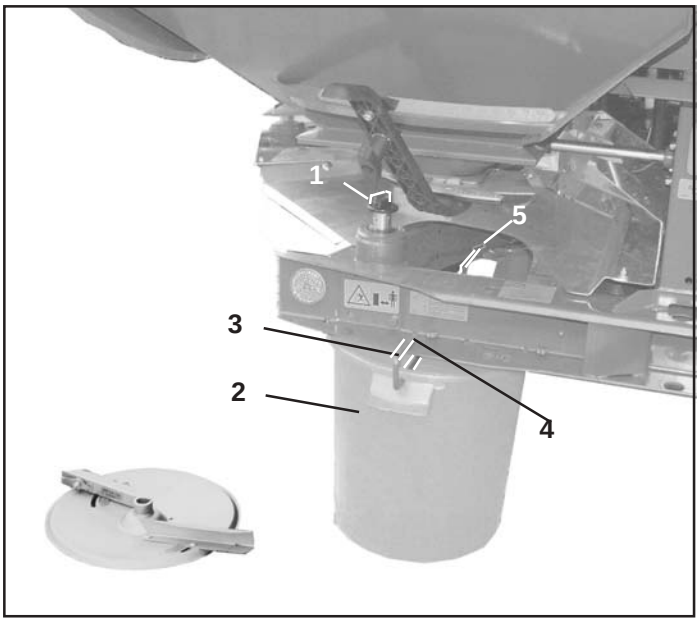


Fig. 7.9

- Set the shutter slide position (Position) **23**.

We recommend to carry out a fresh spread rate check with this shutter slide position.

7.3 Checking the spread rate

A spread rate check is recommended with every change of fertiliser.

The **spread rate check** (calibration test) can be carried out with switched on hydraulic drive with a **normal spreading disc speed** for both spreading discs by **driving a test distance** or **stationary**.

Driving a test distance is the more accurate method, because hereby the actual forward speed of the tractor is directly considered.

If the forward speed of the tractor in the field is exactly known, the spread rate check can also be carried out stationary.

The multiplier for the total quantity consideres the one-sided spread rate check.

At high fertiliser application rates per hectare halve the test distance and double the multiplier because the capacity of the collecting bucket is limited.

Carry out spread rate checks with approximately half filled hopper.

7.3.1 Arrangements for the spread rate check

- Swivel upwards the guard tube centre part (if guard tube installed).
- Set the required shutter slide position for the desired spread rate on the left hand side hopper tip.
- Remove the left hand spreading disc.
  - Unscrew the thumb nut (7.9/1) for fixing the left hand spreading disc and pull the spreading disc off the gear box shaft.
  - Screw thumb nut again in gear box shaft (to avoid any fertiliser dropping into the threaded hole).
- Hang the calibration bucket (7.9/2) with its handle (7.9/3) into the rear retainer (7.9/5) and the front retainer (7.9/4) on the frame.

Working width [m]	Required forward distance [m]	Area covered [ha]	Multiplier for the total spread rate
9,00	55,5	1/40	40
10,00	50,00	1/40	40
12,00	41,60	1/40	40
15,00	33,30	1/40	40
16,00	31,25	1/40	40
18,00	27,75	1/40	40
20,00	25,00	1/40	40
21,00	23,80	1/40	40
24,00	41,60	1/20	20
27,00	37,00	1/20	20
28,00	35,70	1/20	20
30,00	33,30	1/20	20
32,00	31,25	1/20	20
36,00	27,75	1/20	20

Fig. 7.10

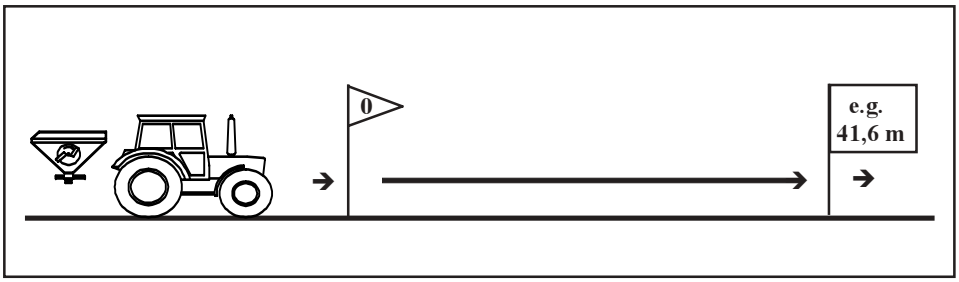


Fig. 7.11

7.3.2 Spread rate check by driving a test distance

Example:

Kind of fertiliser:	**CAN 27 % BASF (white)**
Working width:	**24 m**
Speed of operation:	**10 km/h**
Spread rate:	**350 kg/ha**
Shutter slide position according to setting chart:	**43**

- From the table (Fig. 7.10) you may take the required test distance **41.6 m** and the multiplier **20** for the desired working width **24 m**.

Calculate test distances for working widths not shown in the table accordingly (see below).

- Carefully measure the test distance in the field. Mark beginning and end of the test distance (Fig. 7.11).
- Set shutter slide position **43**.
- Hang in collecting bucket.
- Switch on hydraulic drive and set the spreading disc speed **720 min**$^{-1}$ (unless otherwise stated for working width setting in the setting chart).
- Carefully drive test distance from beginning to end under field conditions, e. g.
  - with half filled hopper,
  - intended constant operational speed **10 km/h** and
  - the spreading disc speed required for the working width.

  Open the left hand shutter exactly on the beginning of the test distance and shut at the end point.
- Weigh the collected fertiliser [kg] **e.g. 17,5 kg**.
- From the collected amount of fertiliser [kg] the actual set spread rate [kg/ha] can be calculated.

$$\text{pread rate} = \frac{\text{collected fertiliser quantity [}\mathbf{17,5}\text{ kg] x multiplier }\mathbf{20}}{\text{ha}} = \mathbf{350}\text{ [kg/ha]}$$

In case the actual and the desired spread rate deviate, correct the shutter slide position accordingly. If necessary, repeat the calibration test.

- After having determined the exact shutter slide position for the left hand hopper tip, set the right hand setting lever on the same shutter position.

Working width [m]	Required test distance [m]	Multiplier for the total spread rate	Required time [sec] to drive the test distance at working speed of [k.p.h.]		
			8	10	12
9	55,50	40	24,97	19,98	16,65
10	50,00	40	22,50	18,00	15,00
12	41,60	40	18,72	14,98	12,48
15	33,30	40	14,98	11,99	9,99
16	31,25	40	14,06	11,25	9,37
18	27,75	40	12,49	9,99	8,32
20	25,00	40	11,25	9,00	7,50
21	23,80	40	10,71	8,57	7,14
24	41,60	20	18,72	14,98	12,48
27	37,00	20	16,65	13,32	11,10
28	35,70	20	16,06	12,85	10,71
30	33,30	20	14,98	11,99	9,99
32	31,25	20	14,06	11,25	9,37
36	27,75	20	12,49	9,99	8,32

Fig. 7.12

Conversion of the required test distance for working widths not shown in the setting table

Working widths up to 21 m - Multiplier 40

$$\text{Required test distance at desired working width [m]} = \frac{500}{\text{Working width [m]}}$$

Working widths from 24 m - Multiplier 20

$$\text{Required test distance at desired working width [m]} = \frac{1000}{\text{working width [m]}}$$

7.3.3 Stationary spread rate check

Example:

Kind of fertiliser:	**CAN 27 % BASF (white)**
Working width:	**24 m**
Speed of operation:	**10 km/h**
Spread rate:	**350 kg/ha**
Shutter slide position according to setting table:	**43**

- Please take from the table (Fig. 7.12) the required time **14.98 sec.** which is necessary to drive the required test distance **41.6 m** for the desired working width **24 m** and the desired forward speed **10 km/h** as well as the multiplier **20** for the spread rate conversion.

Convert times for working widths or forwqard speeds not mentioned in the table (see below).

- Set shutter slide position **43**.
- Hag in collecting bucket.
- Switch on hydraulic drive and set the spreading disc speed **720 min**$^{-1}$ einstellen (unless otherwise stated for the working width setting in the setting table).
- Open the left hand shutter for exactly **14.98 sec**.
- Weigh the collected amount of fertiliser [kg] **e.g. 17,5 kg**.
- Calculate the actually set spread rate [kg/ha] from the collected fertiliser amount [kg].

$$\text{Spread rate} = \frac{\text{Collected fertiliser [}\mathbf{17,5}\text{ kg] x multiplier }\mathbf{20}}{\text{ha}} = \mathbf{350}\text{ kg/ha}$$

In case the actual and the desired spread rate deviate, correct the shutter position accordingly. If necessary, repeat the calibration test.

- After having determined the exact shutter position for the left hand hopper tip, set the righthand setting lever on the same setting figure.

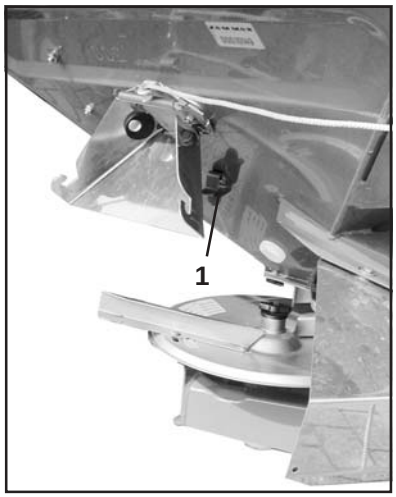


Fig. 7.13

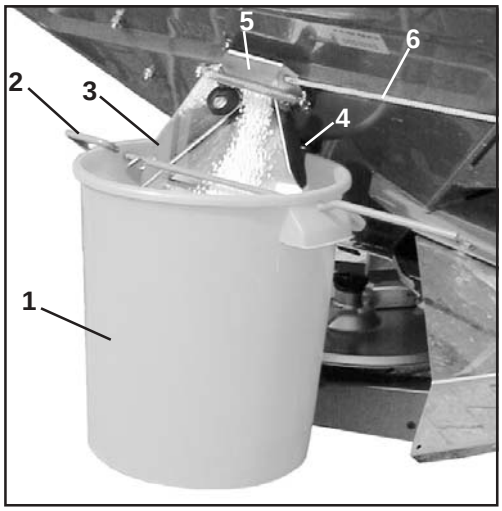


Fig. 7.14

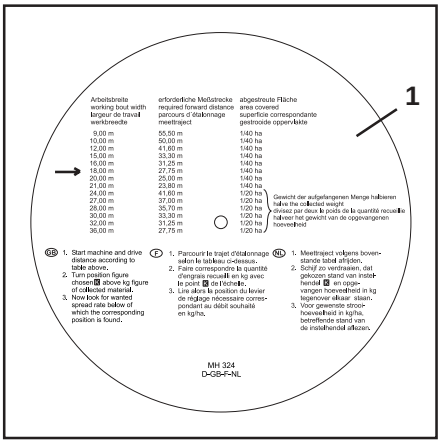


Fig. 7.15

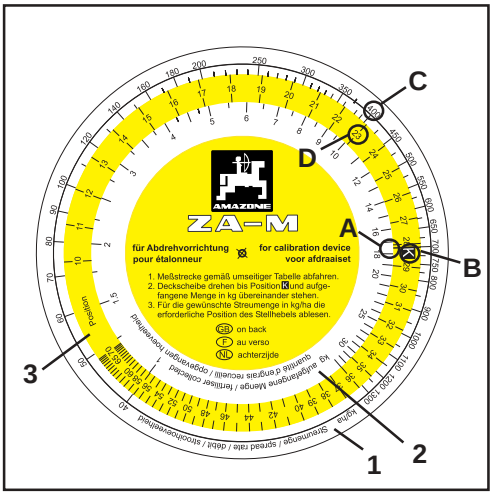


Fig. 7.16

Conversion of the required measuring time for working widths (measuring distances) or speeds of operation not shown in the table

Rrequired calibration time [sec] at desired working width	=	$\frac{\text{Test distance [m]}}{\text{working speed [km/h]}}$	x 3,6

7.4 Setting the shutter slide position with the aid of the calibration device (special option)

When determining the shutter slide position with the aid of the calibration device, make use of the calculation disc rule provided with this special option (7.16)! (On the centre, coloured scale you will find position „K“.)

Example:

Working width:	**18 m**
Desired spread rate:	**400 kg/ha**
Desired forward speed:	**10 k.p.h.**
Shutter slide position:	**?**

When determining the shutter slide position, both shutters of the opening should be closed and the pto shaft disengaged!

- By using the handle (7.14/2) hook the collecting bucket (7.14/1) on to the outlet chute (7.14/3) Let the collecting bucket catch into the clamping device (7.14/4 a. 7.13/1).
- Entirely open the side shutters (7.14/5) of the outlet chute for approx. 5 sec. by using the rope (7.14/6) (to ensure an even fertiliser flow). Then pour the collected fertiliser back into the spreader.
- Take from table (7.15/1) for the desired working width **18 m** the required test distance of **27,75 m** for **1/40 ha** area to be spread.
- Carefully measure the test distance in the field. Mark beginning and end of the test distance.
- Carefully drive test distance from beginning- to end mark under field conditions,e. g. with half filled hopper, intended constant operational speed **(10 km/h)** and a pto shaft speed of **540 R.P.M.** (unless otherwise stated for the working width setting in the setting chart). When doing so, entirely open at the measure distance starting point the side shutters of the outlet chute from the tractor cab with the aid of the rope (pull until stop) and close the shutters on the measure distance end.
- Weigh collected fertiliser quantity, e. g. **17,5 kg**.

For working widths of more than 24 m halve the collected amount of fertiliser (e.g. 25 kg: 25 kg/2 = 12,5 kg) and determine the shutter slide position with this figure.

- Take the calculating disc rule **for the calibration device.** Find on the scale **(7.16/2)** for the collected material [kg] the figure "**17,5**“ **(7.16/A)** and align with position "**K**" **(7.16/B)** on the coloured scale **(7.16/3)**.

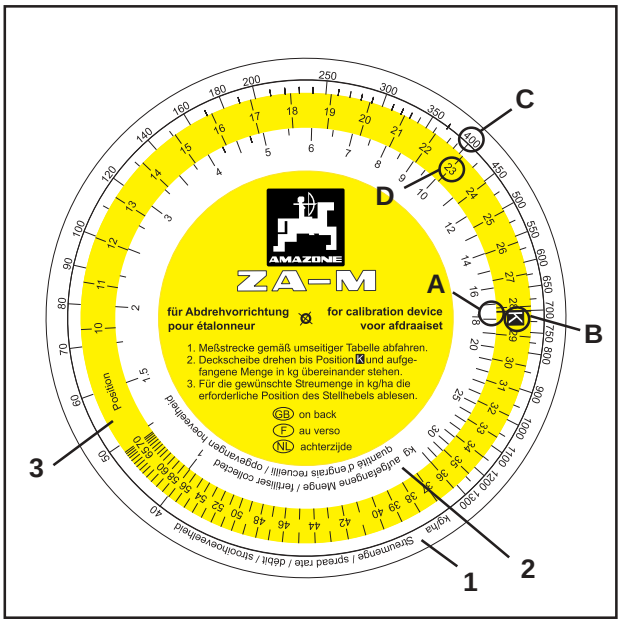


Fig. 7.16

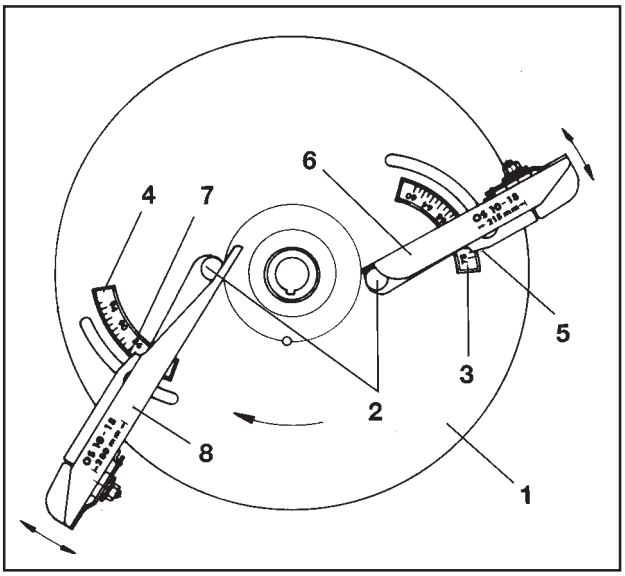


Fig. 7.17

- Look for the wanted spread rate **(400 kg/ha) (7.16/C)** on the scale for the spread rate **(7.16/1)** and read off the required shutter slide position "**23**" **(7.16/D).**
- Set shutter slide position "23".

7.5 Setting the working width

The working width is influenced by the spreading properties of the fertiliser.As known, the main influence factors regarding the spreading properties are grain size, bulk density, surface coating and humidity. Depending on the kind of fertiliser the **"Omnia-Set"** spreading discs (Fig. 7.17/1) allow the setting of varying working widths between **10** and **36 m**. Normally, those working widths can be set, which lie within the spreading range of the individual "Omnia-Set" spreading disc pairs (when spreading urea, however, deviations may occur).

To set the various working widths (distance between the tramlines) the spreading vanes can horizontally, steplessly be swivelled round the pivoting point (Fig. 7.17/2).

By swivelling the spreading vanes in direction of rotation of the spreading discs (onto a higher figure on the scale) the working width is increased. When swivelling them against the direction of rotation, the working width is reduced. The shorter spreading vane distributes the fertiliser mainly in the spread pattern centre, while the longer vane mainly spreads onto the outer range.

7.5.1 Swivelling the spreading vanes

Take from the **setting chart** the required vane position depending on the kind of fertiliser to be spread and on the desired working width. If the fertiliser cannot distinctly be associated with a certain kind in the **setting chart**, the **AMAZONE- fertiliser service** will give you **recommendations** for the setting, either immediately on the phone or after sending a small fertiliser sample **(3 kg)**.

AMAZONE-fertiliser service

Germany: 0049-5405/ 501111or 501164 - Fax: 5405/501134
or for the UK and Rep. of Ireland: (UK: 0044) 01302-751200

For the exact individual spreading vane setting without any tools, various, non-interchangeable scales (Fig. 7.17/3 and 7.17/4) are arranged on the spreading discs.

Example:

Kind of fertiliser:	CAN 27 % N prilled, BASF (white)
Desired working width:	12m

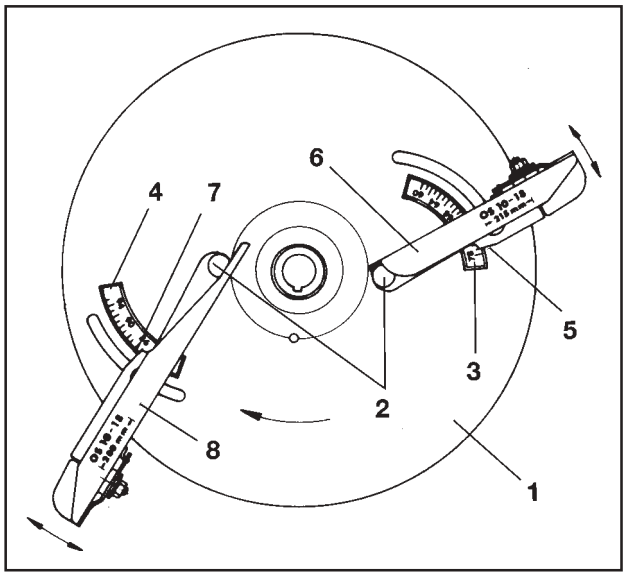


Fig. 7.17

Fig. 7.18

Vane position dependent on kind of fertiliser and working width **from the setting chart: "70/90".**

Kind of fertiliser	Blade position at working width of					Spread rate see page
	10 m	12 m	15 m	16 m	18 m	
CAN 27 % N granular, BASF (white); Hydro; DSM; Kemira; Agrolinz	70/90	70/90	70/90	70/90	70/90	68

Excerpt from setting chart

Set spreading vanes on spreading discs as follows:

- Slacken thumb nut beneath the spreading disc.

For slackening thumb nut turn spreading disc until the nut is situated at the side and can be loosened without any problem.

- Swivel read off edge (Fig. 7.17/5) of the short vane (Fig. 7.17/6) on figure "70" of scale (Fig. 7.17/3) and **retighten thumb nut firmly.**
- Swivel read off edge (Fig. 7.17/7) of the long vane (Fig. 7.17/8) on figure "90" of scale (Fig. 7.17/4) and **retighten thumb nut firmly.**

7.5.2 Checking the working width with the mobile test kit (option)

The setting values of the setting chart have to be considered as **guide values** only, as the spreading properties of the kinds of fertiliser vary. It is recommended to check the set working widths of the fertiliser broadcaster with the mobile test kit (Fig. 7.18) (option).

For further details, please refer to the instruction manual **"Mobile test kit"**.

7.6 Spreading on field boundaries and field sides

For spreading along fields' boundaries or fields' sides the border spreading discs **"Tele-Set"**

TS 5 - 9 **TS 10 - 14**
TS 15 - 18 **TS 4**

or the **boundary spread deflector / Limiter** (option) are available.

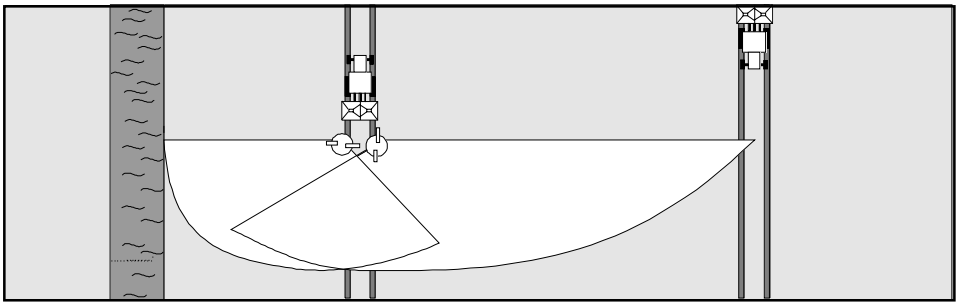


Fig. 7.19

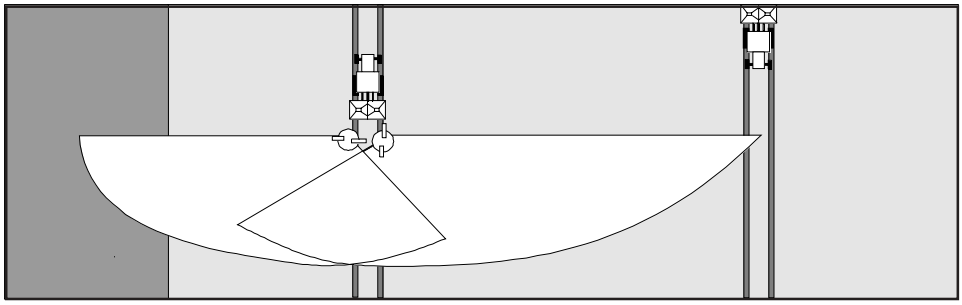


Fig. 7.20

Fig. 7.21

7.6.1 Boundary- resp. side-spreading with the border spreading disc "Tele-Set"

For boundary spreading (according to the draft of fertiliser application decree) (Fig. 7.19) resp. **spreading to field sides** (beside owned, equally to be treated areas) (Fig. 7.20) **exchange** the **left hand "Omnia-Set"** spreading disc (left hand side border spreading - normal case), seen in driving direction, **for** the corresponding border spreading disc **"Tele-Set"**. For right hand border spreading a special border spreading disc is available on request.

The border spreading disc **"Tele-Set"** creates a spread pattern with a spreading fan steeply dropping off towards the fields' side. **When not in use the border spreading disc "Tele-Set" resp. the spreading disc "Omnia-Set" should be fixed to the side of the machine (Fig. 7.21).**

With the aid of the swivelable telescopic vanes the throwing width of the fertiliser towards the "field's side" can be set on the distance of the first track (tramline) from the field's side, i.e. 5 - 9 m with **TS 5 - 9**, 10 - 14 m with **TS 10 - 14**, 15 - 18 m with **TS 15 - 18** and **TS 4** for the border spreading at distances of 15 - 18 m.

7.6.1.1 Boundary spreading according to the fertiliser application decree (Fig. 7.19)

According to fertiliser decree

- no fertiliser may be thrown beyond the border.
- eroding and washing off (e. g. in surface water) must be prevented.

By this imposition an underfertilised side strip of about 2 to 6 m automatically results, depending on the distance of the first track from the field's border. **Due to this inevitable spreading width reducing also the shutter slide position on the field's border has to be reduced by the positions (division marks) shown in the setting chart.**

After termination of border spreading set shutter in prior position and change the spreading disc.

7.6.1.2 Border spreading beside own, evenly to be treated areas (Fig. 7.20)

In certain cases (e. g. owned, adjacent, evenly to be treated areas [except for surface water]), a nearly complete fertilising up to the field's side may be achieved by other spreading blade positions (e. g. for a larger distance from the field's side) resp. longer blades and thus an underfertilised side-strip is avoided. In such cases **do not** reduce the shutter position.

The spread patterns may deviate from the illustrated spread patterns.

7.6.2 Setting the border spreading disc according to fertiliser decree (Fig. 7.19)

Setting the border spreading discs **TS 5 - 9** and **TS 10 - 14** resp. **TS 15 - 18** and **TS 4** is done by the telescopic vanes (Fig. 7.22/1) according to the data given in the setting chart, depending on kind of fertiliser to be spread and the distance of the first track from the field's side as follows:

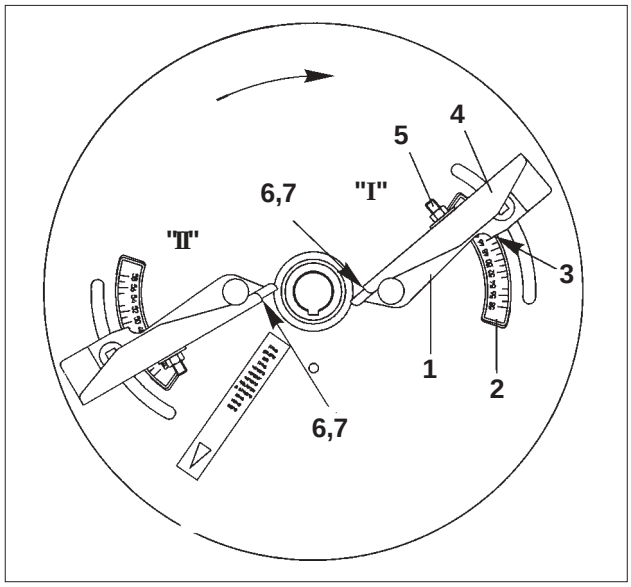


Fig. 7.22

a) After having slackened the corresponding thumb nut, swivel the telescopic blades (Fig. 7.22/1) on the spreading within the range of the scale (Fig. 7.22/2). Read off figure on the reading line (Fig. 7.22/3) and retighten thumb nut.

Function:
Swivelling telescopic vane on higher setting figure on the scale: **Spreading width wider, steeper drop off at the side.**

b) After slackening the nut (Fig. 7.22/5) set outer vane part (Fig. 7.22/4) on a higher letter value on the scale (Fig. 7.22/6). Read off the position of the vane outer part on the reading line (Fig. 7.22/7) on the scale.

Function:
Setting vane outer part in direction of a higher value on the scale: **Spreading width wider, shallower drop off at the sides.**

For setting the telescopic vanes the kinds of fertiliser can be divided into 6 groups:

Group I: granular material with good flowing properties with a bulk density of approx.1,0 kg/l, e.g. CAN, NP- and NPK-types.

Group II: prilled material with good flowing properties with a bulk density up to approx. 1,0 kg/l, e. g. CAN, NP- and NPK-typess.

Group III: granular, coarse material with mean flowing properties with a bulk density above 1.5 kg/l, e. g. phosphate- and potash-types.

Group IV: granular, coarse material with mean flowing properties with a bulk density less than 1.5 kg/l, e. g. DAP-, MAP-types.

Group V: Urea granular with a bulk density of up to approx. 0,8 kg/l.

Group VI: Urea prilled with a bulk density of up to approx. 0,8 kg/l.

1. Example:
Distance of the first tramline to the field's border: 9 m **(TS 5-9)**
Kind of fertiliser: CAN 27 % N granular, BASF (white), (Group I)

Kind of fertiliser	Vane	m				
		5	6	7,5	8	9
CAN- and NPK-types granular material	I	400 B 47	400 C 48	C 49	C 49	D 50
	II	400 D 45	400 E 45	E 42	E 42	F 42

Excerpt from the setting chart for TS 5-9

Taken from setting chart resp. table above: **D 50/ F 46**

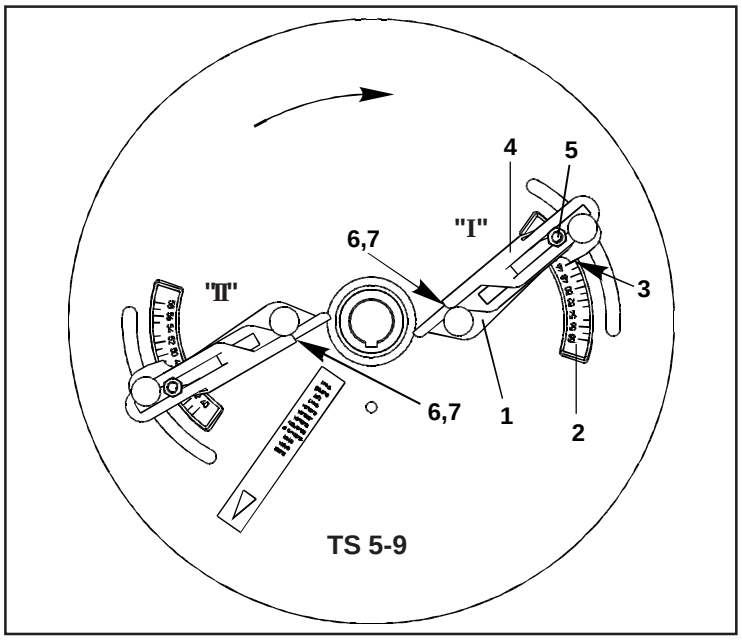


Fig. 7.23

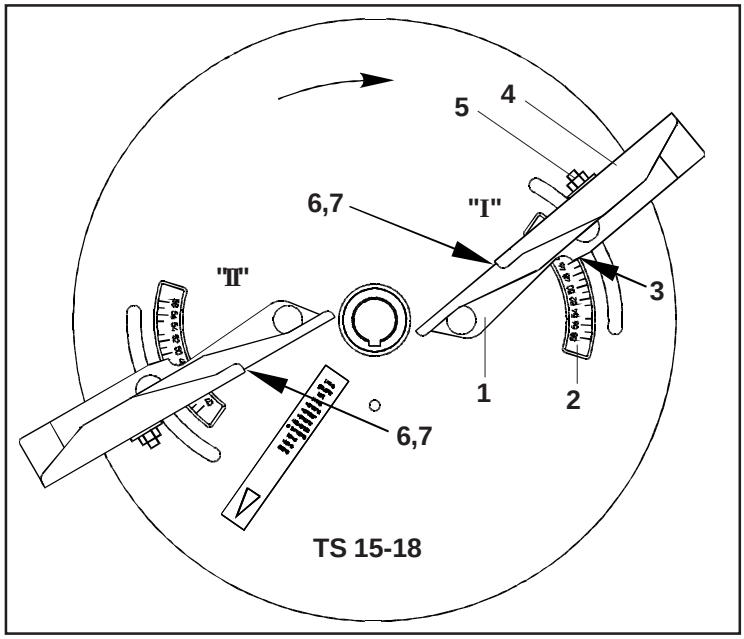


Fig. 7.24

- Set reading line (Fig. 7.23/7) of vane "I" to letter value **"D"** and fix outer vane part. Swivel vane "I" to figure **"50"** and fix.
- Set reading line (Fig. 7.23/7) of vane "II" to figure value **"F"** and fix outer vane part. Swivel vane "II" to figure **"46"** and fix.

2. Example:
Distance from first tramline to the field's border: 15 m **(TS 15-18)**
Kind of fertiliser: CAN 27 % N granular, BASF (white), (Group I)

Kind of fertiliser	Vane	m		
		15	16	18
CAN- and NPK-types granular material	I	B 51	C 52	E 53
	II	E 42	F 42	H 42

Excerpt from setting chart for TS 15-18

Taken from setting chart resp. table above: **B 51/ E 42**

- Set reading line (Fig. 7.24/7) of blade "I" to letter value **"B"** and fix outer vane part. Swivel vane "I" to figure **"51"** and fix.
- Set reading line (Fig. 7.24/7) of blade "II" to figure value **"E"** and fix outer vane part. Swivel vane "II" to figure **"42"** and fix.

7.6.2.1 Characteristic features at border spreading with 5 resp. 6 m distance of the first tramline to the field's border

(please also refer to para. 4.1)

At some kinds of fertiliser reduce the pto-shaft speed from 540 min^{-1} to 400 min^{-1}, as otherwise the "Omnia-Set" disc fitted on the broadcaster's field side will throw approx. 8 m beyond the tractor centre towards the field's side (i. e. 2 to 3 m beyond the field's border) (please note relevant hints in the setting chart).

7.6.2.2 Exceptions at border spreading (tramline centre does not correspond to half the working width from the field's side)

Here choose shutter position (setting lever position) for setting the spread rate in dependence of the various working widths (tramline distances). At the field's side also swivel backwards the shutter position for 2 to 6 scale lines.

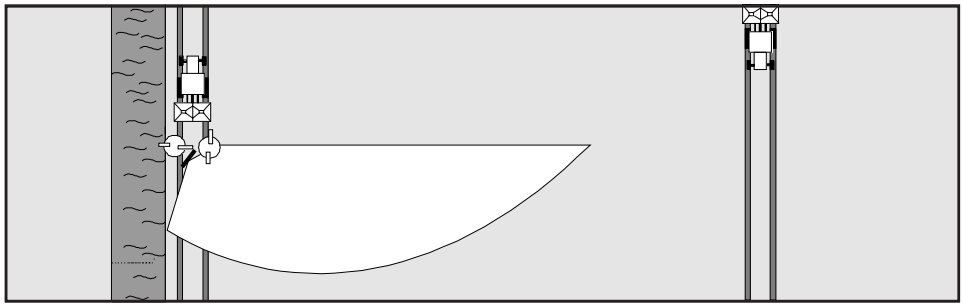


Fig. 7.25

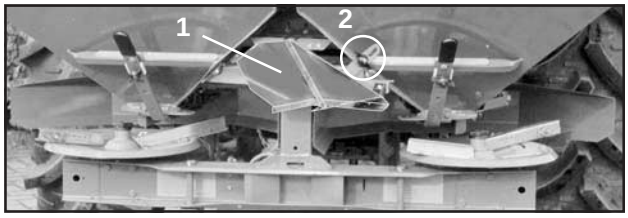


Fig. 7.26

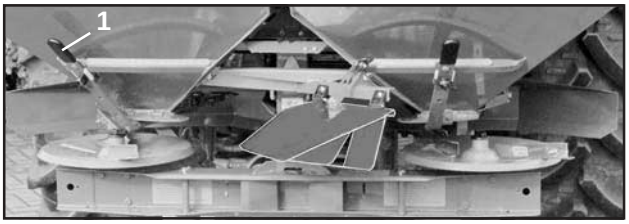


Fig. 7.27

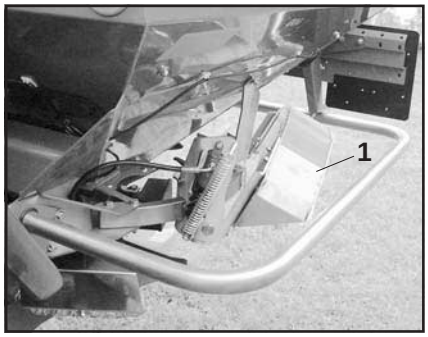


Fig. 7.28

Fig. 7.29

Example:

Spacing between the tramlines:	**24 m** (corresponds to 24 m working width)
Distance of the first tramline from the left hand field side:	**8 m** (corresponds to 16 m working width)
Kind of fertiliser:	CAN 27 % N granular, BASF
Forward speed:	10 k.p.h.
Desired spread rate:	300 kg/ha

Determine the shutter position for the desired spread rate according to the setting chart and consider the various working widths.

Shutter position: right hand (24 m working width) = 41 (310 kg/ha)
left hand (16 m working width) = 34 (300 kg/ha) - 3 = **31**

Vane position: right hand OS 20-28 from setting chart (DS 485 S.23)
24 m working width: **68/87**
left hand TS 5 - 9 from setting chart (DS 485 S.47)
8 m distance of the first tramline to the field's side: **C 49/ E 42**

7.6.3 Border spreading with the boundary spread deflector (option) (tramline centre 1.5 to 2.0 m from field side)

(also refer to para. 4.1)

If the tramline is placed into the first working path of the seed drill (Fig. 7.25) (with a 3 m seed drill the distance of the first tramline to the field's side is 1.5 m), use the border spread deflector (Fig. 7.26/1) and proceed as follows:

- **Close left hand (right hand) shutter (Fig. 7.27/1)** (please refer to para. 5.2)**.**
- After having slackened the lock nut (Fig. 7.26/2) swivel downwards the border spread deflector (one-sided) (Fig. 7.26/1) from out of operation- (Fig. 7.26) to operation position (Fig. 7.27). Swivel downwards border spread deflector (two-sided) by remote control.
- Arrest border spread deflector (one-sided) by tightening the lock nut.

Thus the fertiliser is only thrown 1.5 to 2 m to the field's side.

7.6.4 Boundary spreading with Limiter M (special option) (first tramline on half the working width)

If the first tramline has been created on half the working width of the fertiliser spreader, proceed as follows with the border spread deflector Limiter M (Fig. 7.28/1):

- Before boundary spreading set the boundary spread deflector on the Limiter M according to the table. The setting is done in accordance with the distance towards the field’s boundary, the kind of fertiliser and depending on whether field side- or boundary spreading shall be carried out (please also observe para. 7.6).
- Hydraulically swivel down the boundary spread deflector from position “out of operation (Fig. 7.28) into operational position (Fig. 7.29).
- After having spread the boundary swivel upwards the boundary spread deflector hydraulically and proceed with the normal spreading.

Fig. 7.30

7.7 Changing the spreading discs

- Remove thumb nut (Fig. 7.30/1).
- Spin the spreading disc until the disc hole ø 8 mm faces towards the machine's centre.
- Pull off spreading disc from the gearbox shaft.
- Set up other spreading disc.
- Fix spreading disc by tightening the thumb nut.

When setting up spreading disc do not mix up "left hand" and "right hand". The spreading discs are marked with decals accordingly (Fig. 7.30/2).

The right hand side gearbox shaft has got a shear pin: Here always set up the right hand spreading disc with the two keys.

When fitting the spreading discs OS 30-36 equip your broadcaster with guard tube (accident prevention)!

On broadcasters equipped with AMATRON or AMADOS control the shutter slides should be fully opened for changing spreading discs.

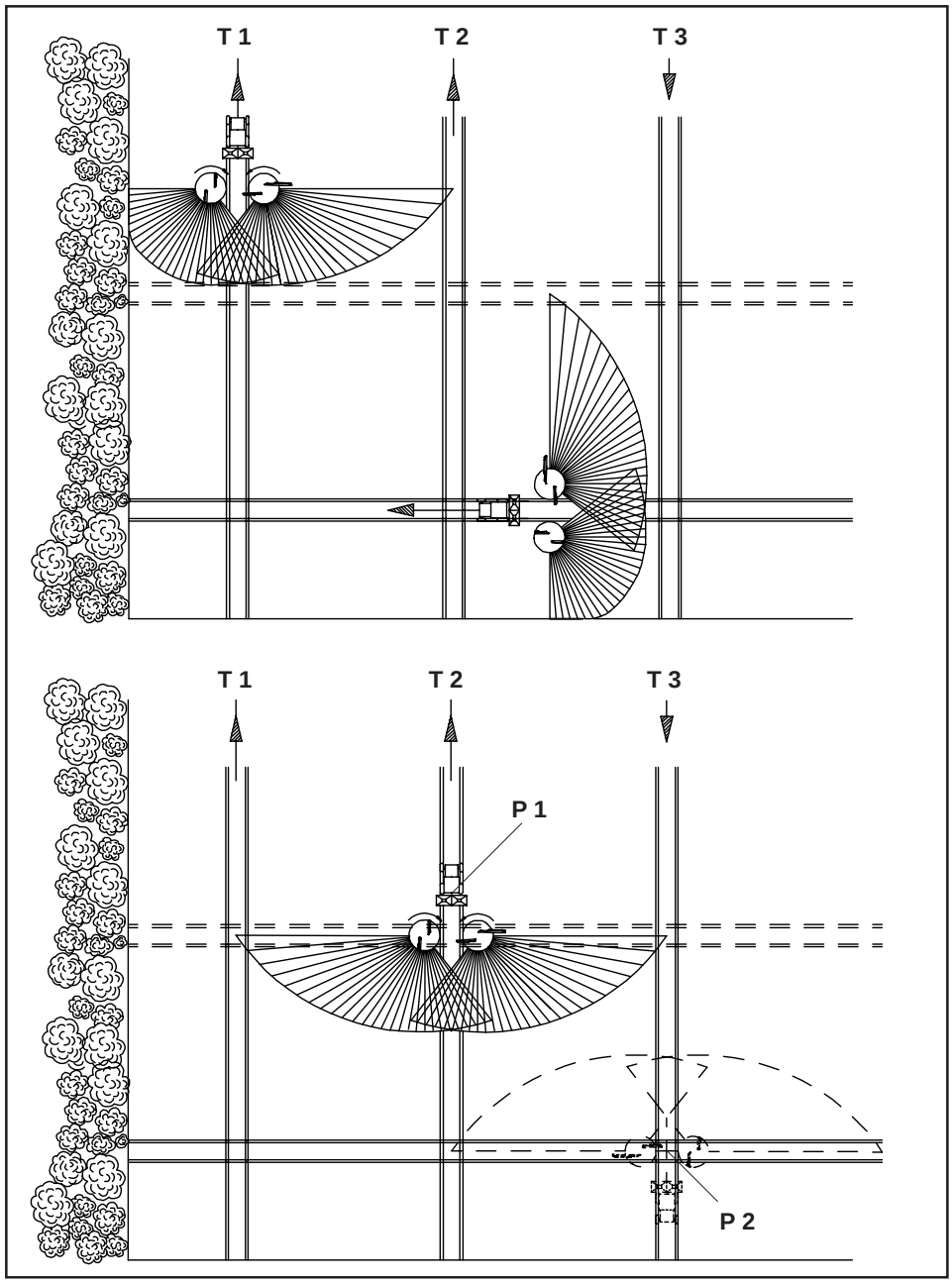


Fig. 7.31

7.8 Recommendations for broadcasting on the headlands

Precondition for an exact broadcasting at field borders resp. field sides is the corect creating of tramlines. By using the border spreading disc "Tele-Set" the first tramline (Fig. 7.31/T1) is normally always created in a distance of half the tramline spacing to the field side (see para. 7.6). In the same way, such a tramline is created on the headlands. As a check a further tramline (broken line) on the headlands is very helpful - with full spacing of one working width.

Under consideration of the advice given in para. 7.6 drive along the field in the first tramline in clockwise direction (right hand turn) . After this course round the field exchange again the border spreading disc "Tele-Set" against the spreading disc "Omnia-Set".

As centrifugal broadcasters also throw the fertiliser to the rear, the following has strictly to be noted for an accurate distribution on the headlands:

Open resp. shut shutter in different distance to the field's side when driving to (tramlines T1, T2 etc.) and fro (tramlines T3, etc.).

Open the shutter when "driving to" approx. **on point P1** when the tractor passes the 2nd tramline on the headlands (broken line).

Close the shutter when "driving fro" **on point P2**, when the broadcaster is in line with the first tramline on the headlands.

Proceeding as described above prevents fertiliser losses, over- or under fertilising and thus is a environment friendly working method.

7.9 Advice for spreading slug pellets (e.g. Mesurol)

1. In standard execution the centrifugal broadcaters **AMAZONE ZA-M prem*iS*, nov*iS* and max*iS*** can also be used for wide spreading of slug pellets. Slug pellets (e. g. Mesurol) have a granular shape or similar and is spread in relatively small rates (e. g. 3 kg/ha).

2. **When filling the centrifugal broadcaster avoid inhaling the dust and direct contact with your hands (wear protective gloves). After application clean your hands and all parts of the skin having been in contact with the dust thoroughly with water and soap.**

   In general regarding handling slug pellets, we refer to the advisce of the manufacturer and to the general protective measures for handling pesticides (code of practice by the health and safety board).

   Slug pellets can be very dangerous to children and pets (e. g. dogs). Always store it out of reach of children and pets!

3. When travelling to the field and back make sure, that **both shutters are locked.** In case spreading material leaks from the hopper (pile-formation), immediately take it up and remove it carefully. When spreading slug pellets take care, that the shutter openings are always covered with spreading material and that the pto shaft is constantly driven with a speed of 540 R.P.M. A residue of approx. 0.7 kg per hopper tip cannot be spread as declined. For emtying the spreader open shutter and collect spreading material dropping out (e. g. on a canvass).

   Store the collected spreading material safely in a closed container in a room inaccessible for children and pets.

4. For green manure seed, grain and slug pellets (option) take the details for setting your spreader from the specific setting chart. These values may only be considered as guide values. Before starting to operate conduct a spread rate check (para. 7.5).

   Because of the small spreading rate it is recommended to at least triple the required test distance. Hereby the multiplier reduces on a third of the indicated value (e. g. for the working width 9 m: multiplier 40 : 3 = 13.3).

5. Slug pellets must **not** be mixed with fertiliser or other materials in order to possibly work with the spreader in another setting range.

	19	18	17	16	15	14	13	12	11	10
Fan extension								×	×	×
					×	×	×			
	×	×	×	×						
Spreading discs				×			×			×
			×			×			×	
		×			×			×		
	×									
Close-to-machine options	×	×	×	×	×	×	×	×	×	×
	×	×	×	×				×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×
	×	×	×	×	×	×	×	×	×	×

prem*iS*
nov*iS*
max*iS*
Pair of spreading discs OS 10-12
Pair of spreading discs OS 10-18
Pair of spreading discs OS 20-28
Pair of spreading discs OS 30-36
Hopper extension S 500
Hopper extension L 1000
Border spreading disc TS 5-9
Border spreading disc TS 10-14
Border spreading disc TS 15-18
Border spread deflect
Limiter M
Mobile fertiliser test kit
AMADOS III D
AMATRON II with chip card
AMATRON II without chip card

8.0 Special advice for the operation

1. **Note max. payload!** (please refer to para 1.2)

2. Engage pto shaft only at slow tractor engine speed.

In case the shear bolt continues to shear off, exchange standard pto-shaft for a pto-shaft with friction clutch (option). Please refer to para 10.15).

3. If a trailer hitch is provided it must only be used for towing implements or twin axle trailers if:
   - the maximum speed of **25 kph** is not exceeded,
   - the trailer has a run-on brake or a brake which can be actuated from the tractor operator,
   - the permissible total weight of the trailer is not more than **1.25** times the permissible total weight of the tractor, however, **5 tons** in maximum.

4. When lifting the fertiliser broadcaster the front axle load of the tractor is relieved by different amounts depending on the size of the tractor. Always check that the necessary front axle load of the tractor (**20 %** of the tractor's net weight) is maintained!

5. **Do not approach rotating spinner discs! Danger of injury! Danger by fertiliser particles being thrown around. Advise people to leave the danger area.**

6. At **new** machines after **3 - 4** hopper fillings check nuts and bolts regularly for tightness and retighten if necessary!

7. At some spreading materials as Kieserite, Excello-granules and magnesium sulphate an incredased wear on the spreading blades may occur .

8. In case of leaking control valve and/or longer periods standstills, e. g. during road transport, shutting the lock taps prevent the closed shutters from opening by themselves (please also refer to para. 5.2).

9. Open shutter only when prescribed pto shaft speed **(e. g. 540 R.P.M.)** has been reached.

   For some kinds of fertiliser another pto shaft speed is required. Please refer to data in the setting chart.

10. Maintain constant pto speed and driving speed for best performance.

11. **If the implement is transported over longer distances with filled hopper, closed shutters and out of function (en route to the field), 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.**

12. Only use well granulated fertilisers and kinds of fertiliser being mentioned in the setting chart. In case of insufficient knowledge about the fertiliser conduct a working width check with the mobile fertiliser test kit (para. 7.3.2).

13. When spreading **mixed fertilisers** mind that

    - the individual kinds may have different spreading properties.
    - a demixing of the individual kinds may occur.

    The stated **setting recommendations** for the **lateral distribution only** refer to the **distribution of weight** and **not** to the **nutrient distribution**.

14. If in spite of an equal shutter position an uneven emptying of the two hoper tips is noted, check the main shutter position (please refer to para. 9.4).

15. By the foldable sieve against foreign particles, e. g. stones, hard earth clods resp. fertiliser clods or plant residues are sorted out.

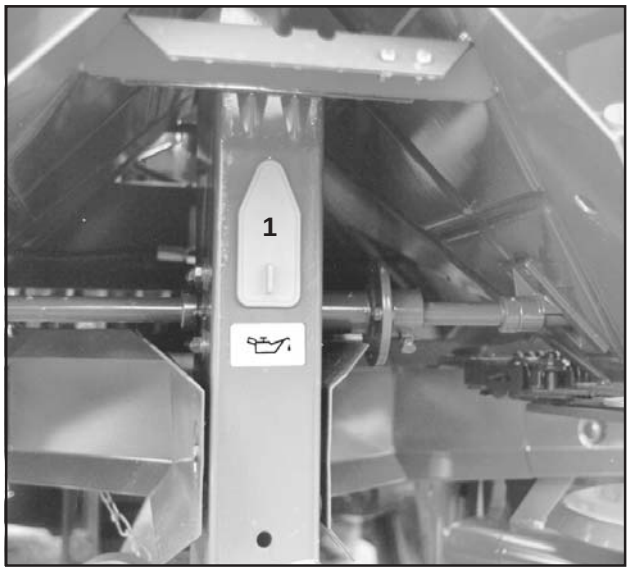


Fig. 9.1

9.0 Cleaning, maintenance and repair

Clean and grease centrifugal broadcaster or the universal joint shaft only after the pto shaft and engine have been stopped and ignition key is removed.

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

Grease shutter guides after every operation!

1. After use clean the machine with a normal jet of water (greased implements only on washing bays with oil traps). Clean outlet openings and shutters especially carefully. Treat dry machine with an anticorrosive agent. (Only use biologically degradable protective agents). Park machine with **opened** shutters.

   Also grease the threads of the T-bolts for the shutter lever locking as well as their washers, so that the clamping connection remains functioning.

2. Clean and grease agitator shaft-drive chain (Fig. 9.1/1).

3. When parking the machine deposit the pto shaft in the catching hook.

4. **The technical condition of the spreading vanes incl. their swivel blades essentially influences the even lateral fertiliser distribution in the field (creation of stripes).** The spreading vanes have been manufactured from especially wear resistant and non corrosive steel. However it is indicated that the spreading vanes and their swivel blades are wearing parts. Exchange spreading blades as soon as breakages by wear are noticeable. Exchange swivel blades as soon as in the upper range a slit is noted. The longevity of the spreading vanes and swivel blades depends on the kinds of fertiliser used, on the operation times and quantities spread.

5. Under normal conditions input- and angular gearbox are maintenance-free. The gearboxes are supplied with sufficient gear oil by the manufacturer. 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 gearbox housing. Search for reason, care for remedy and fill in oil.

Oil quantity:	**Input gearbox:**	**0,4 l SAE 90 gear oil**
	Angular gearbox:	**each 0,15 l SAE 90**

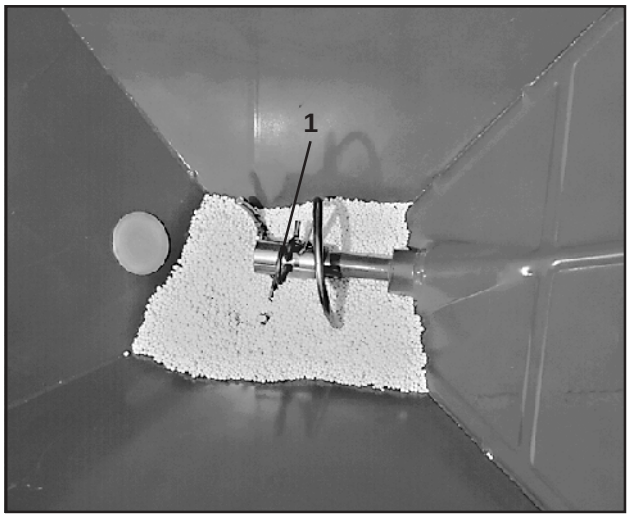


Fig. 9.2

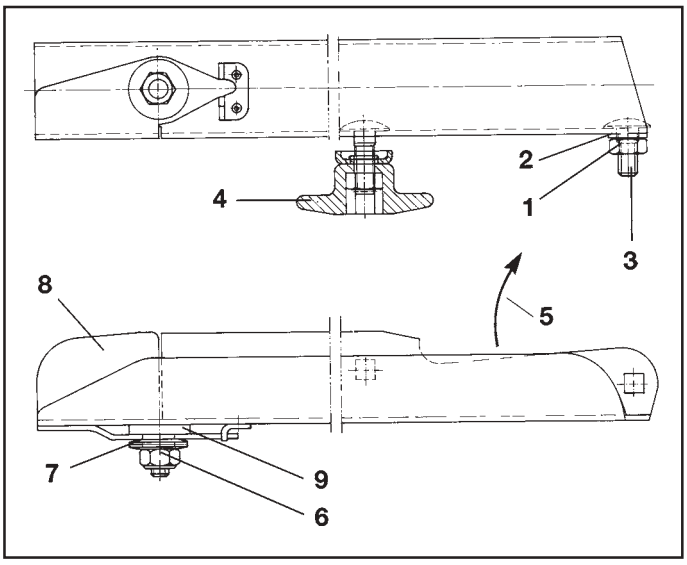


Fig. 9.3

9.1 Shear-off safety for pto shaft- and agitator shaft drive

1. The separately supplied **bolts 8 x 30**, DIN 931, 8.8 are **exchange-bolts 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.
2. Agitator spiral clip pins (Fig. 9.2/1) serve as shear off safety of the agitator shaft.

9.2 Exchanging spreading vanes

- Slacken self-locking nut (Fig. 9.3/1).
- Remove washer (Fig. 9.3/2) and flat mushroom head bolt (Fig. 9.3/3).
- Slacken thumb nut (Fig. 9.3/4) and exchange spreading vanes.
- Fitting the spreading vanes is done in vice versa order.
- **Tighten the self locking nut (Fig. 9.3/1) in such a way, that the spreading vane can be swivelled by hand.**

Note the correct fitting of the spreading vanes. The open side of the U-shaped spreading vane shows into sense of rotation (Fig. 9.3/5).

9.3 Exchange of swivel blades

- Slacken self locking nut (brass CuZn) (Fig. 9.3/6) and remove together with spring washers (Fig. 9.3/7).
- Exchange swivel blades (Fig. 9.3/8).

Mind plastic washer (Fig. 9.3/9) between spreading vane and swivel blade.

- **Heap up** spring washers **reciprocally** (do not stack).
- Tighten self locking nut (Fig. 9.3/6) with a torque of **6 - 7 Nm**, so that the swivel blade can still be swivelled upwards by hand, however does not swivel up by itself during operation.

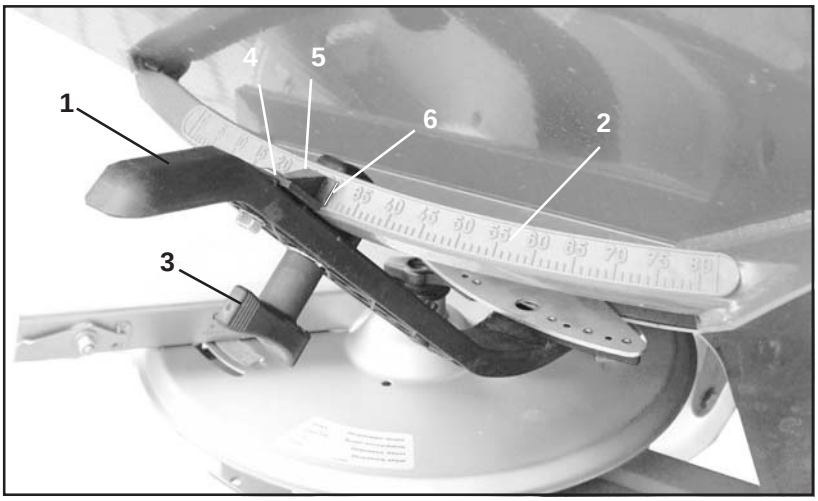


Fig. 9.4

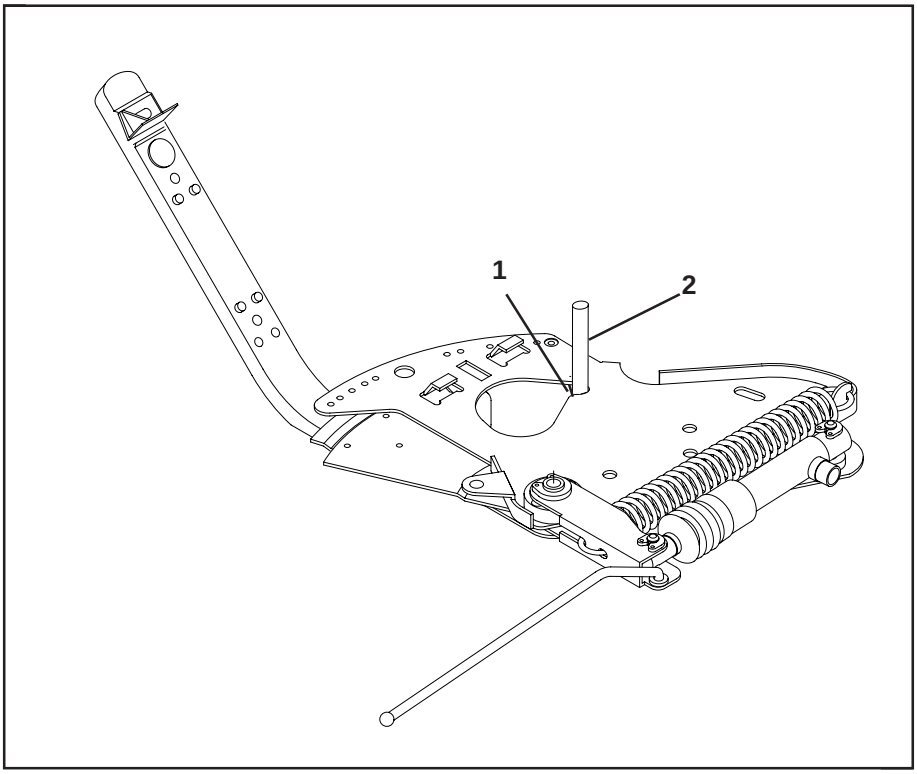


Fig. 9.5

9.4 Checking the basic setting of the shutter slides

The space opened in the outlet opening (Fig. 9.5/1) by the shutters in shutter position „**8**“ has been set by the factory with a dead mandril (pin Ø 12 mm)(Fig. 9.5/2).
This setting represents the basic setting of the shutter.

If at equal shutter slide position an uneven emptying of the two hopper tips is noticed, check shutter slide basic position as follows:

When actuating the shutters do not reach into the hopper outlet opening! Danger of bruizing!

- Hydraulically open the shutter slide.
- Open the spread rate shutter with the aid of the setting lever (Fig. 9.4/1).
- Insert a pin of **12 mm Ø** (shaft of a 12 mm drill) into the opening.
- Swivel the setting lever on the scale (Fig. 9.4/2) until the stop on the pins.
- Arrest the setting lever with the star knob (Fig. 9.4/3).
- Slacken the hex. bolt (Fig. 9.4/4). Align the pointer (Fig. 9.4/5) with the scale figure „8“ and fix with the hex. bolt. The read-off edge of the pointer is Fig. 9.4/6.
- Remove pin.

9.5 Dismantling pto shaft

- Slacken tapered grease nipple in the connecting yoke of the pto shaft - by opening lower side of the protective cone.
- Remove shear bolt between yoke flange and pto shaft and flange of the gearbox input shaft.
- With the aid of a flat bar push the connecting yoke off the gearbox inpout shaft from the rear through the slit in the protective cone rear wall (on hopper lower side).

When pushing the connecting yoke off the gearbox input shaft repeatedly slightly twist the pto shaft.

Fig. 10.1

Fig. 10.2

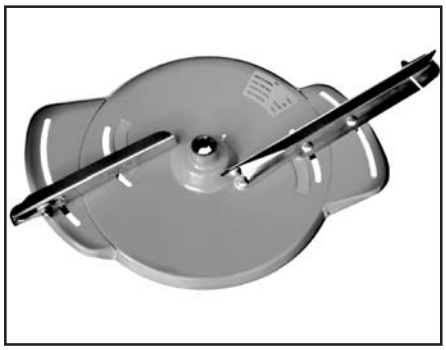


Fig. 10.3

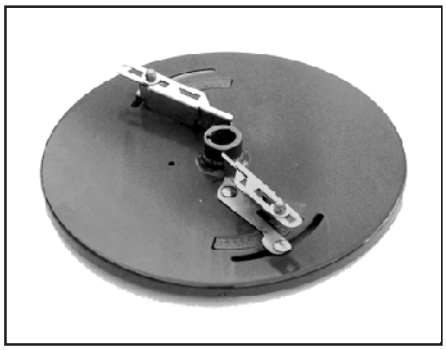


Fig. 10.4

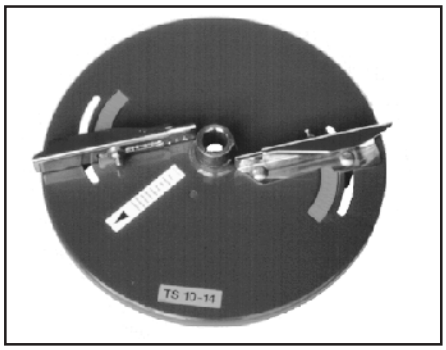


Fig. 10.5

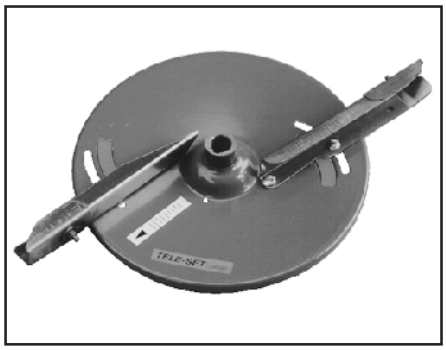


Fig. 10.6

10.0 Options

10.1 Spreading discs "Omnia-Set"

also refer to para. 7.5

10.1.1 Pair of spreading discs "Omnia-Set" OS 10-12

For working widths resp. tramline spacings of 10 to 12 m. **Product No.: 913 925**

10.1.2 Pair of spreading discs "Omnia-Set" OS 10-18

For working widths resp. tramline spacings of 10 to 18 m (Fig. 10.1). **Product No.: 922 800**

10.1.3 Pair of spreading discs "Omnia-Set" OS 20-28

For working widths resp. tramline spacings of 20 to 28 m (Fig. 10.2). **Product No.: 922 801**

10.1.4 Pair of spreading discs "Omnia-Set" OS 30-36

For working widths resp. tramline spacings of 30 to 36 m (Fig. 10.3). **Product No.: 922 802**

When using these spreading discs fit guard tube (danger of accident)!

10.2 Spreading discs "Omnia-Set" OS-HSS

Increased life span of the vanes due to hard alloy coating, only for normal fertilising.

10.2.1 Pair of spreading discs "Omnia-Set" OS-HSS 10-18

For working widths resp. tramline spacings of 10 to 18 m. **Product No.: 922 942**

10.2.2 Pair of spreading discs"Omnia-Set" OS-HSS 20-28

For working widths resp. tramline spacings of 20 to 28 m. **Product No.: 922 810**

10.2.3 Pair of spreading discs "Omnia-Set" OS-HSS 30-36

For working widths resp. tramline spacings of 30 to 36 m. **Product No.: 922 943**

10.3 Border spreading discs "Tele-Set"

10.3.1 Border spreading disc "Tele-Set" TS 5-9

For distances of 5 to 9 m towards field border (measured from tractor centre), settable for different tramline systems and varying kinds of fertiliser.

left hand fitted - **normal case** - (Fig. 10.4), **Product No.: 912 717**
right hand fitted - **special case** - **Product No.: 912 725**

Fig. 10.7

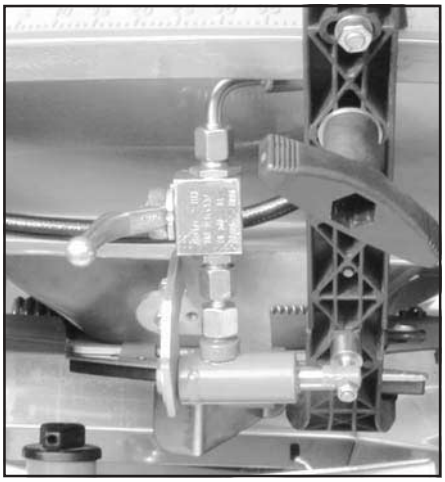


Fig. 10.8

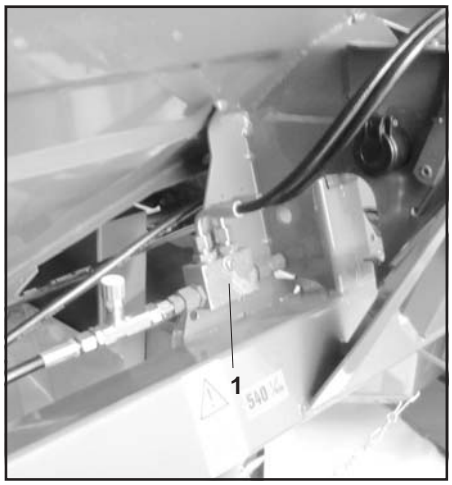


Fig. 10.9

10.3.2 Border spreading disc "Tele-Set" TS 10-14

For distances of 10 to 14 m towards field border (measured from tractor centre), settable for different tramline systems and varying kinds of fertiliser.

left hand fitted - **normal case** (Fig. 10.5), **Product No.: 912 732**
right hand fitted - **special case** - **Product No.: 912 739**

10.3.3 Border spreading disc "Tele-Set" TS 15-18

For distances of 15 to 18 m towards field border (measured from tractor centre), settable for different tramline systems and varying kinds of fertiliser.

left hand fitted - **normal case** (Fig. 10.6), **Product No.: 912 744**
right hand fitted - **special case** - **Product No.: 912 749**

10.3.4 Border spreading disc "Tele-Set" TS 4

For boundary spreading at distances from 15 to 18 m towards the field's edge (measured from the tractor centre), settable for various tramline systems and different kinds of fertiliser.

left hand fitted - **normal case** - **Product No.: 916 804**
right hand fitted - **special case** - **Product No.: 912 597**

10.4 Boundary spreading device, left hand side - Limiter M (Fig. 10.7)

For boundary spreading and border spreading, if the first tramline has been created on half the working width of the fertiliser spreader.

Hydraulically remote controlled, no need to leave the tractor cab or to stop the tractor.

Product No.: 921 290

10.4.1 Automatic spread rate reduction Limiter M (Fig. 10.8)

Automatic hydraulically remote controlled spread rate reduction when boundary spreading Limiter M.

Product No.: 921 987

10.4.2 Locking device for Limiter M (Fig. 10.9/1)

For a comfortable operating the Limiter, against unintended lowering the boundary spread deflector in case of leaking tractor valves (separate double acting control valve required).

Product No.: 921 793

Fig. 10.10

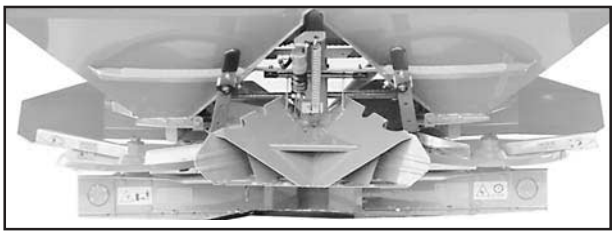


Fig. 10.11

Fig. 10.12

Fig. 10.13

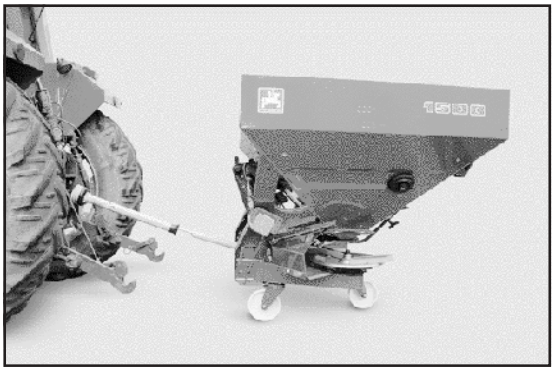


Fig. 10.14

10.5 Boundary spread deflector

For boundary spreading if the first tramline centre has been created 1,5 to 2,0 m from the field's border, please also refer to para. 7.6.3.

10.5.1 Boundary spread deflector, to one side

eft hand - for left hand boundary spreading (Fig. 10.10), **Product No.: 173 301**
right hand - for right hand boundary spreading **Product No.: 174 301**

10.5.2 Boundary spread deflector, to both sides (Fig. 10.11)

To both sides, remote controlled via Bowden cable, **Product No.: 911 060**

To both sides, hydraulically remote controlled, **Product No.: 914 407**
(for tractors with 2 single acting control valve.)

10.6 Swivelable guard tube (Fig. 10.12)

for ZA-M max*iS*, **Product No.: 921 291**
for ZA-M prem*iS*, nov*iS*, **Product No.: 921 777**

Required as guard when using the spreading discs OS 30-36 (collision guard, prevents accidents when spreading discs are spinning, swivelable for a comfortable spreading disc exchange).

10.7 Lateral calibration device (Fig. 10.13)

For an easier spread rate control without spreading disc removal, right hand side.

Product No.: 922 911

10.8 Transport- and parking device (detachable)

The detachable transport- and parking device (Fig. 10.14) allows a comfortable coupling to the three-point hydraulic of the tractor and an easy manoeuvring in the yard and inside buildings.

Product No.: 914 193

Do not park or roll your broadcaster with filled hopper (danger of tipping over).

For a direct filling from a tipping trailer remove roll kit.

Fig. 10.15

Fig. 10.16

Fig. 10.17

10.9 Hopper extensions

The fertiliser broadcasters ZA-M can be provided with a narrow hopper extension with a capacity of 500 l (S 500) or a wide hopper extension with a capacity of 1000 l (L 1000). The wide hopper extension „**L**“ has an upper hopper width of **2,90 m** and allows a quick and comfortable filling, e. g. with a wide industrial loading shovel. The narrow hopper extension „**S**“ features an upper hopper width of **2,30 m**.

In addition the extensions according to para. 1.2 (technical data) may be combined in various versions, so that a hopper capacity of up to 3000 l (ZA-M max*iS*) can be obtained.

10.9.1 Hopper extension S 500 (Fig. 10.15)

Product No.: 922 782

10.9.2 Hopper extension L 1000 (Fig. 10.16)

Only for ZA-M prem*iS* und max*iS*

Product No.: 922 786

When increasing the hopper capacity of the ZA-M maxiS to 3000 l an upper link re-inforcement must be used (Product No.: 922 908).

10.10 Swivelable hopper cover (Fig. 10.17)

Also in wet weather conditions, the swivelable hopper cover guarantees dry spreading material. For filling the swivelable hopper cover is simply swivelled upward.

10.10.1 Swivelable hopper cover S

Suited for hopper extension S 500, as well as for all basic hoppers.

Product No.: 922 909

10.10.2 Swivelable hopper cover L

Suited for hopper extension L 1000.

Product No.: 115 800

10.11 Traffic light kit for AMAZONE-mounted implements

The traffic light kit can be retrofitted and adjusted to various implemend widths (up to 3 m).

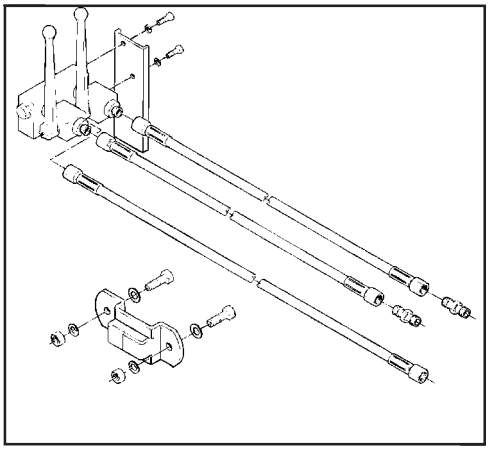


Fig. 10.18

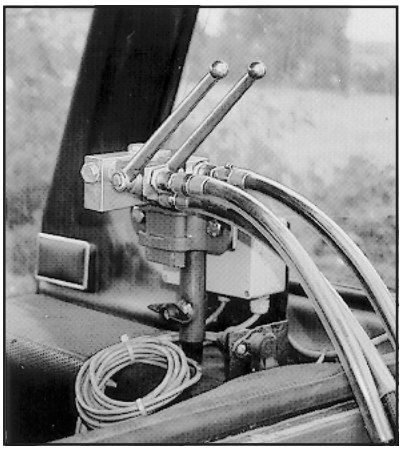


Fig. 10.19

Fig. 10.20

10.11.1 Traffic light kit "rear"

The traffic light kit "rear" (Fig. 10.17) is bolted onto the guard tube retainer of the hopper rear wall. It consists of: Light combination right hand and left hand; parking warning plates according to DIN standards11030; registration plate and connecting cable.

Product No.: 916 253

10.11.2 Traffic light kit "front"

The traffic light kit "front" is necessary for all broadcaster types with a wide hopper extension "L 1000" and is fixed to the traffic light kit "rear". It consists of parking warning plates according to DIN standards 11030 with limiting lights right hand and left hand and connecting cable.

Product No.: 917 649

10.12 Two-way-valve unit

The two-way-valve (Fig.10.18) is required for the hydraulic single shutter control on tractors with only **one** single acting hydraulic connection.

Product No.: 145 600

Fig. 10.19 Block ball taps closed
Fig. 10.20 Block ball taps opened

Half sided spreading with two-way valve unit:
For the independent closing resp. opening the shutters, the following actuations have to be conducted at half-sided spreading or spreading of arable fields.

a) One-side opening of the right hand shutter, e. g. for left hand border spreading with the boundary spread deflector:
- Close both shutters.
- Shut block ball tap for the hydraulic ram of the left hand hopper tip.

When actuated by the control valve, now only the right hand shutter is opened resp. closed, the left hand one remains closed.

b) One-sided closing of the right hand shutter when spreading:
- Both shutters are open.
- Shut block ball tap for the hydraulic ram of the left hand hopper tip.
- Set control valve on **"lifting"** and hereby close the right hand shutter.

c) Change from one-sided spreading to spreading to both sides, e. g. additional actuation of left hand shutter:

- Right hand shutter opened (left hand shutter closed via block ball tap).
- Open block ball tap for hydraulic ram of the left hand hopper tip.
- Set control valve on **"lowering"** and hereby open both shutters.

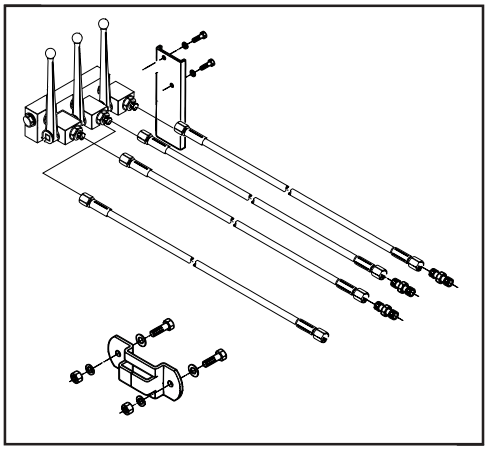


Fig. 10.21

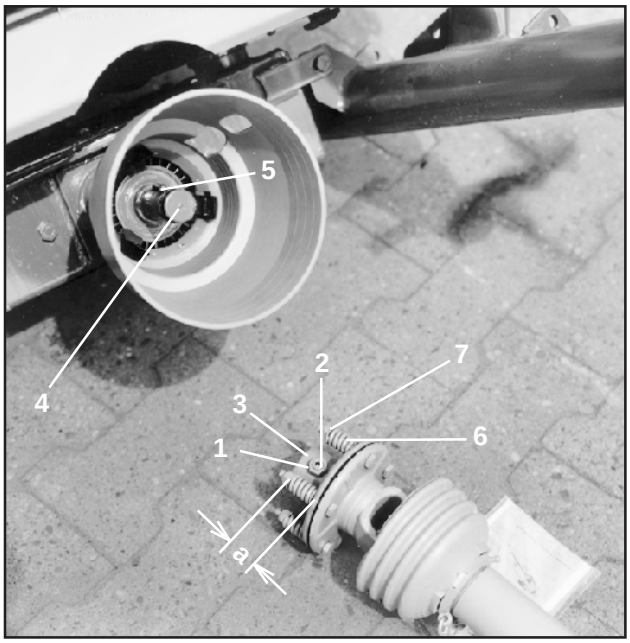


Fig. 10.22

10.13 Three way valve

The three way valve (Fig.10.21) is required for the hydraulic single shutter control and use of the Limiter M on tractors with only one single acting hydraulic control valve.

Product No.: 922 320

10.14 Mobile fertiliser test kit for checing the working width

Please refer to para. 7.5.2. **Product No.: 125 900**

10.15 Pto shaft with friction clutch

If the shear bolt between connecting yoke- and gearbox input shaft repeatedly shears off and on tractors with roughly engaging tractor pto the Walterscheid pto shaft with friction clutch is recommended (Fig. 10.22).

Product No.: EJ 281

Fitting

- Remove pto shaft supplied as standard (please refer to para. 9.5).
- Loosen and pull off the fitted protective cone from the gearbox neck.
  - Lift up twisting securing.
  - Twist and pull off the protective cone..

Replace the protective cone by the supplied longer protective cone (accident prevention)!

- Detach yoke flange from gearbox input shaft.
- Clean gearbox input shaft.
- Slacken counter nut (Fig. 10.22/1) inside connecting yoke from friction clutch (until the grub screw does not protrude the counter nut outside any longer). Unbolt inner hex. grub screw (Fig. 10.22/2) and check whether the connecting yoke can easily be pushed onto the pto shaft.
- Pull connecting yoke off the gearbox input shaft again.
- Set protective cone on the gearbox extension and arrest by twisting.
- Push connecting yoke (Fig. 10.22/3) with grease applied until the stop of the gearbox input shaft (Fig. 10.22/4).

Take care for a complete covering of the key (Fig. 10.22/5)!

- Secure special pto shaft against axial shifting. For this firmly tighten grub screw with Allen key and secure with nut (Fig. 10.22/1).

Before the first operation and longer periods of stand still “air” the friction clutch.

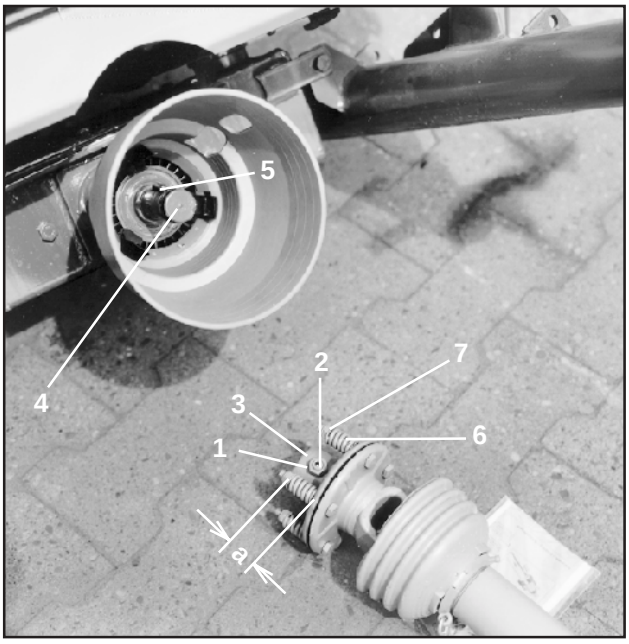


Fig. 10.22

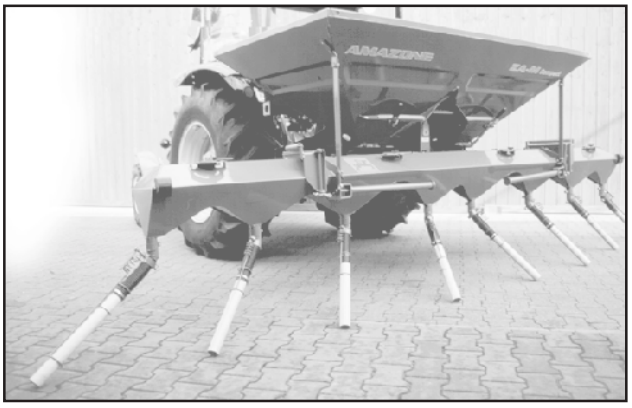


Fig. 10.23

Dismounting

- Slacken counter nut (Fig. 10.22/1) in connecting yoke from friction clutch. Drive out grub screw (Fig. 10.22/2).
- With the aid of a flat bar push the connecting yoke off the gearbox inpout shaft from the rear through the slit in the protective cone rear wall (on hopper lower side).

Functioning and maintenance of friction clutch

Short-time torque peaks of above **approx. 400 Nm**, as they might occur for example when engaging the pto shaft, are limited by the friction clutch. The friction clutch prevents damages on pto shaft and gearbox elements. Therefore, the function of the friction clutch has always to be assured. A baking of the friction linings by corrosion prevent an actuation of the friction clutch. **For this reason "air" the friction clutch after a longer period of standstill or before the first operation as follows:**

1. Dismantle friction clutch from gearbox input shaft.
2. Relief springs (Fig. 10.22/6) by slackening the nuts (Fig. 10.22/7).
3. Fully turn the clutch by hand. Hereby any bakings by rust or humidity between the friction linings will be loosened.
4. Tighten nuts that much, that the pressure springs have the indicated fitting length of **a = 26,5 mm**.
5. Push friction clutch onto gearbox input shaft and fix. The friction clutch is now ready for operation again.

High air humidity, strong pollution or cleaning the machine with a high pressure cleaner increase the danger of baking of the friction linings.

10.16 Pto shaft W 100E-810

(pto shaft supplied as standard) **Product No.: EJ 280**

10.17 Pto shaft W TS100E-810

Telespace telescopic. **Product No.: EJ 296**

10.18 Rubber mud guard

If the tractor's rear wheels throw clods of soil into the aera of the spinning spreading discs when spreading fertiliser, mud guards should be fitted to the front side of the spreader.

Product No.: 918 844

10.19 Row spreading device (Fig. 10.23)

The AMAZONE ZA-M can be retrofitted with a 4-, 6-, or 8-row spreading device for underleaf fertilising, especially for fertilising maize (however, not possible in conjunction with the mounting trailer). The row spacing can be set at variance up to 80 cm. The fertiliser metering

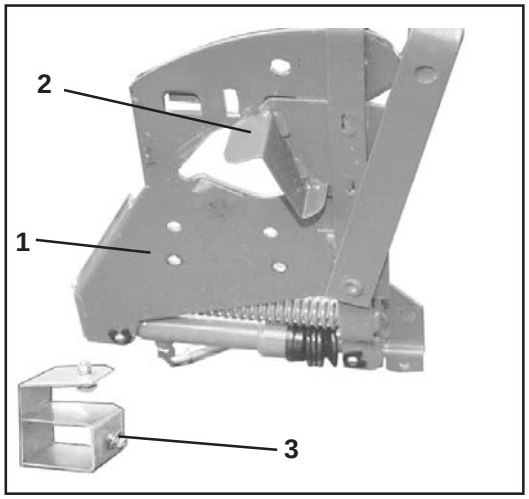


Fig. 10.24

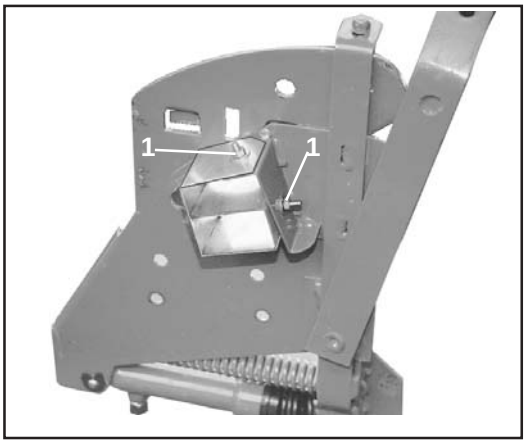


Fig. 10.25

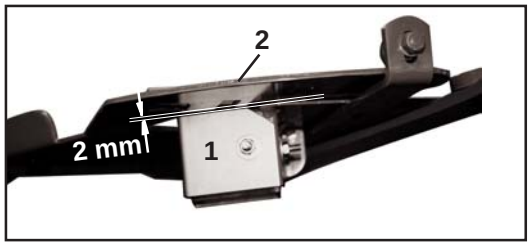


Fig. 10.26

is done via the broadcaster. Special spreading discs distribute the fertiliser on the 4, 6 or 8 rows. Settable guide wings care for an even fertiliser distribution in all rows.

The guidance of the fertiliser towards the soil prevents scorching on the plants. The fertiliser is placed in rows, evenly distributed on the soil beside the plants.

4-row spreading device R 4, working width 3,00 m, Product No.: 160 600
6-row spreading device R 6, working width 4,50 m, Product No.: 161 600
8-row spreading device R 8, working width 6,00 m, Product No.: 162 600

10.20 Special guide plates for broadcasting on slopy terrain

For broadcasting on slopy terrain with more than 20 % inclination or declination. The special guide plates guide the normally vertically dropping flow of fertiliser also onto the pre-designed feeding points of the spreading discs even when operating in slopy terrains.

Product No.: 916 113

Fig. 10.24/...

1 - Bottom plate.
2 - Guide plate (standard)
3 - Special guide plate

Fitting:

- take off spreading disc.
- open shutters fully.
- hold special guide plate (Fig. 10.24/3) against standardly supplied guide plate (Fig. 10.24/2).

Maintain the spacing of 2 mm between the special guide plate (Fig. 10.26/1) and the bottom plate (Fig. 10.26/2).

- Mark 2 holes, drill 9 mm diam. holes and bolt the special guide plate to the standard guide plate by flat head bolts M 6 (Fig. 10.25/1).

By the use of the special guide plates the spread rate is reduced by approx. 30 %.

The diference between the spread rates on horizontal areas on the one hand and up to 40 % on inclining or declining areas on the other hand is comparatively neglectible.

After fitting the special guide plates it is implicitly important to conduct a spread rate check.

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG

Postfach 51
D-49202 Hasbergen-Gaste

Tel.: ++ 49 (0) 5405 501-0
Telefax: ++ (0) 5405 50 11 93
e-mail: amazone@amazone.de
http:// www.amazone.de

Branch factories at:
D-27794 Hude • F- 57602 Forbach
Subsidiaries in England and FranceFabriken für

Factories for: Fertiliser broadcasters, -storage halls, -handling systems. Seed drills.
Soil cultivation machinery. Field Boom Sprayers. Municipal machinery