

Instruction Manual

AMAZONE

Precision Airplanter ED 02



MG 822
DB 701 GB 02.03
Printed in Germany



Before starting operation carefully read and adhere to this instruction manual and the safety advice!



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D-49502 Hasbergen-Gaste
Germany
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Dear customer,

Airplanters ED are yet another high class product from the comprehensive range of farm machinery offered by AMAZONEN-WERKE, H. Dreyer GmbH & Co. KG.

To make fullest use of your new machine we recommend that you carefully read and observe this instruction manual before to start any operation.

The instruction manual contains important hints to operate the implement safe, appropriate and economical. Observing these hints helps to avoid danger and to reduce repair costs and failure periods and to increase the reliability and life span of your implement.

Please ensure that all operators will read this instruction manual before starting to operate the machine.

The instruction manual must always be at hand where the machine is operated.

This instruction manual is valid for all Airplanters of the series ED 02.

Hints for this instruction manual

Keep this instruction manual so that it is always at hand. In case you sell your machine, pass on this instruction manual to the next owner.

At the time of printing all data and indications are on their latest state. As AMAZONE is always endeavouring to introduce improvements, we reserve the right for changes at any time without any engagement.

Symbols in this instruction manual

In this instruction manual dangerous points and hints are marked by symbols (see below).

General danger symbol



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

Attention symbol



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

Hinweis-Symbol



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

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1. Details about the machine

1.1 Range of application

The AMAZONE Airplanter ED is exclusively suited for planting maize, beans, peas, soy beans, sunflower, cotton, sorghum, beet, bracharia and water melons.

1.2 Manufacturer

AMAZONEN-Werke
H. Dreyer GmbH & Co. KG
Postfach 51, D-49202 Hasbergen-Gaste / Germany

1.3 Conformity declaration

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

1.4 Details when making enquiries and ordering

When ordering special options and spare parts, please always indicate the type and serial number of your machine.

All components of your machine have carefully been matched in order to provide you with a high safety standard.

Please be aware that any technical deviation from the original state of your machine may affect its safety. This does not only apply to unsuited spare parts but also for options which do not have our approval.



For your own safety we therefore recommend that you only use original spare parts and original options.

Original spare parts and options have been especially designed for your machine and have been checked.

For all spare parts, options and fitting parts which have not been approved by AMAZONE as well as in case of any other arbitrary technical changes the liability of AMAZONE for resulting damage is ruled out.

1.5 Details about noise level

The tractor operator seat related emission value (sound pressure level) is 76 dB (A), measured when operating with closed tractor cab at the ear of the tractor operator.

Measuring implement: OPTAC SLM 5.

The value of the sound pressure level mainly depends on the vehicle used.

1.6 Type plate

Type plate on the machine (Fig. 1) is of documentary value and may not be changed or disguised.

Please insert here the type and serial number of your machine:

AMAZONE
Airplanter ED

Serial-No.:



Fig. 1

1.7 On receipt of the machine

On receipt of the machine, please 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.

Before commencing work, remove all packing material, wire, etc. and check that all lubrication points are well supplied with grease (PTO shaft).



When pushing the implement the singling discs of the sowing units and the agitator shaft inside the fertiliser hopper of the row fertiliser applicator (if fitted) will rotate, even at gearbox position "0".



Therefore, do not place any parts into the seed hopper or into the fertiliser hopper. Otherwise the singling discs and the agitator shaft might be damaged.



Never reach with your hands into the seed hopper or the fertiliser hopper.

Danger of injury from rotating singling discs or rotating agitator shaft.

1.8 Technical data AMAZONE-ED 02 with Classic sowing units

	ED 302		ED 452		ED 452-K	ED 602	ED 602-K		ED 902-K
Tyres (standard) Terra tyres (option)	6.00-16		10.0/75-15 31x15,5/15			31x15,5/15		26x12,0-12	
Transport width [m]	3,0m		4,0m	3,0m		6,0m	3,05m		3,05m***
Length [m] with and without row fertiliser applicator (with press roller ø 370 mm)	2,10m				1,98m	2,19m		2,6m (Under root fertilising*)	
Number of sowing units (standard execution)	4		6		8		12		
Number of sowing units (max.) (pls. refer to table "possible row spacings" ED 02")									
without under root fertilising	10		12	7		12		18	
with under root fertilising	6				12	8/12*		18*	
Row spacing [cm] (standard execution)	75cm								
Drive	Chain wheel drive 36 steps (standard execution) with additional gear 54 steps							Chain wheel drive (drive via 2 gearboxes)	
Grain spacing [cm]	3,1 – 53,8 depending on the singling disc used							3,1 – 53,8	
Blower fan drive	PTO shaft with free wheel PTO shaft speed 540 RPM, 710 RPM or 1000 RPM (standard) hydraulic blower fan drive (optional equipment)								
Singling unit	Plastic singling discs for maize, beans, peas, soy beans, sunflower, cotton, sorghum								
Fertiliser hopper capacity [l]	450 l		450 l or 800 l		1600 l	1100 l		1500 l**	
Filling height (fertiliser) [m]	1,48m		1,48m or 1,69m		169m	1,80m		see front tank instruction manual	
Front tank	please refer to instruction manual front tank								
Net weight without row fertiliser applicator from	Pressure roller ø 370 mm	630 kg	662 kg	824 kg	903 kg	1254 kg	1334 kg	2975 kg	
Net weight with row fertiliser applicator from	Pressure roller ø 370 mm	854 kg	886 kg	1098 kg	1177 kg	1704 kg	1697 kg	3227 kg	
Front tank (kg)	640 kg								

* only in conjunction with front tank

** FRS 203 / Front tank

*** as 18-row execution with under root fertilising transport width 3.15 m

1.9 Technical data AMAZONE-ED 02 with Contour sowing units

	ED 302	ED 452	ED 452-K	ED 602	ED 602-K	ED 902-K	
Tyres (standard) Terra tyres (option)	6.00-16	10.0/75-15 31x15,5/15		31x15,5/15		26x12,0-12	
Transport width [m]	3,00m	4,00m	3,05m	6m	3,05m	3,05m***	
Length [m] with and without row fertiliser applicator (with pressure roller ø 370 mm)	2,30m			2,18m	2,39m	2,8m (Under root fertilising*)	
Number of sowing units (standard execution)	4	6		8		12	
Number of sowing units (max.) (see table "Possible row spacings ED 02")							
without under root fertilising	6	9	7	12		18	
with under root fertilising	6			12	8/12*	18*	
Row spacing [cm] (standard equipment)	75cm						
Drive	Chain wheel drive 36 steps (standard execution) with additional gear 54 steps					Chain wheel drive (drive via 2 gear boxes)	
Grain spacing [cm]	3,1 – 53,8 depending on the singling disc used					3,1cm – 53,8cm	
Blower fan drive	PTO shaft with free wheel PTO shaft speed 540 R.P.M., 710 R.P.M. or 1000 R.P.M. (standard)						
	Hydraulic blower fan drive (special option)						
Singling unit	Plastic singling discs for maize, beans, peas, soy beans, sunflower, cotton, sorghum, rape, beet, water melons, bracharia						
Fertiliser hopper capacity [l]	450l	450l or 800l		1600l	1100l	1500l**	
Filling height (fertiliser) [m]	1,48m	1,48m or 1,69m		1,69m	1,80m	see front tank instruction manual	
Front tank	Please refer to instruction manual for front tank						
Empty weight [kg] with rubber V-press roller 360 x 50 with / without row fertiliser applicator:							
without row fertiliser applicator from	766 kg	798 kg	1028 kg	1107 kg	1526 kg	1606 kg	3312 kg
with row fertiliser applicator from	990 kg	1022 kg	1302 kg	1381 kg	2112 kg	2105 kg	3564 kg
Front tank [kg]	640 kg						

* only in conjunction with front tank

** FRS 203 / Front tank

*** as 18-row execution with under root fertilising transport height 3,15 m

1.10 Declined use of the machine

Airplanters **AMAZONE ED 302, ED 452, ED 452-K, ED 602, ED 602-K and ED 902-K** have exclusively been constructed for the usual operation in agriculture.

Any other use 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 "declined 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.

Airplanters **AMAZONE ED 302, ED 452, ED 452-K, ED 602, ED 602-K and ED 902-K** 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 advise as well as any further generally accepted safety-, working-, medical- and road-traffic rules and any safety advice on the machine's labels should be adhered to.

AMAZONE machines have been manufactured with great care, however, even in case of designed use, certain deviations from the seed rate of even a total failure cannot totally be excluded. These deviations may be caused e.g. by:

- Varying composition of the seed (e.g. grain size distribution, specific density, grain shape, dressing, sealing).
- Drifting.
- Blocking or bridging (e.g. by foreign particles, bag residue, etc.).
- Undulated terrain.
- Wear of wearing parts (e.g. singling discs . . .).
- Damage by external influence.
- Incorrect drive RPM and travelling speed.
- Incorrect setting of the machine (incorrect mounting).

Therefore, check before any use and also during operation your machine for the proper function and sufficient seed rate accuracy.

Therefore, check before any use and also during operation your machine for the proper function and sufficient seed rate accuracy.



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

2. Safety

In order to ensure a trouble-free operation we recommend you to read this instruction manual carefully and always to adhere to the recommendations given herein.

Please ensure that every operator had read this instruction manual before he puts the implement to operation.

In this instruction manual you will find many hints which will help you to achieve a trouble-free operation.

Descriptions and illustrations in this instruction manual shall explain all functions and give hints which serve your safety and will ensure a safe operation under various conditions.

Please always follow and adhere to all safety advice exactly.

2.1 Danger when not adhering to the safety advice

Not adhering to the safety advice

- may cause danger as well for persons as also for the environment and the implement.
- will lead to a total loss of any right for claims.

In details, not adhering may - for example - lead to the following danger:

- failure of important functions of the machine
- failure of prescribed methods for maintenance and repair
- Endangering of persons by mechanical affects
- Endangering of the environment by leakage of hydraulic oil.

2.2 Operator qualification

The soil tillage implement may only be used, maintained and repaired by persons who have received the appropriate training and are aware of the dangers that such work may involve.

2.3 Symbols in this instruction manual

In this instruction manual points of danger on the implement and hints are identified by symbols (see below)

2.3.1 General danger symbol



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

2.3.2 Attention symbol



Safety advice which may cause danger to the machine and it's function when not being adhered to, are identified with the attention symbol.

2.3.3 Hint Symbol



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

2.4 Warning signs and hint signs on the machine

The warning signs (Fig. 2) indicate dangerous points on the machine. Observing these signs means safety for all persons using this machine.



Fig. 2

The hint signs (Fig. 3) mark the machine's specific points which have to be observed to ensure a correct operation of the machine.

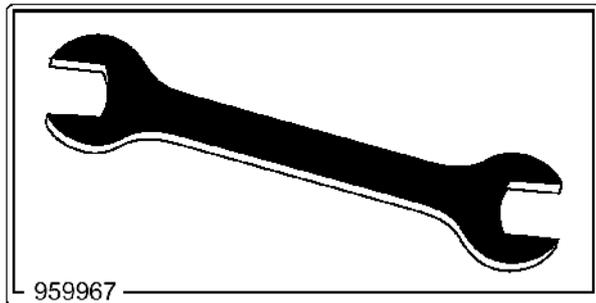


Fig. 3

Figure (Fig. 4 - Fig. 6) shows the fixing points of warning signs and hint signs on the machine. Please refer to the following pages for relevant explanations. Please pass on all safety advice also to other users

Please ask for replacement of damaged or missing decals from your dealer and attach to relevant place! (picture-No.: = Order-No.)

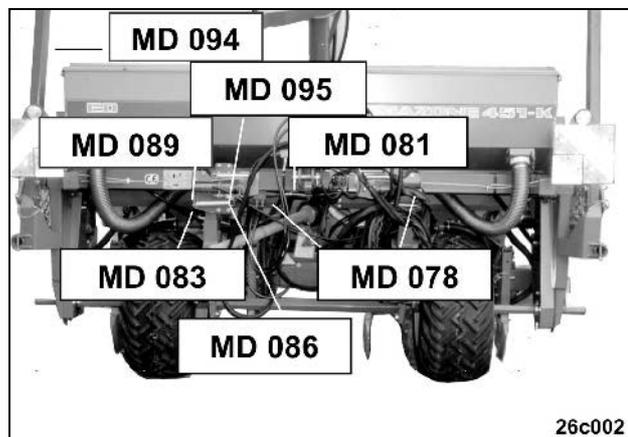


Fig. 4

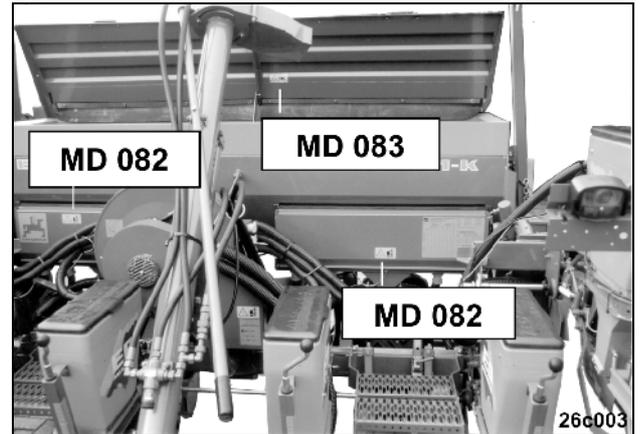


Fig. 5

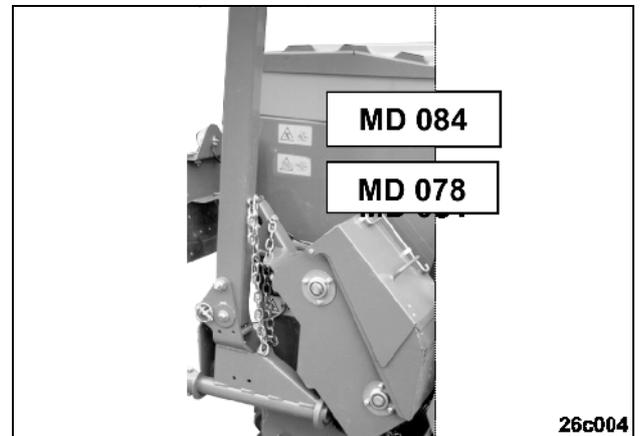


Fig. 6

Explanation for MD078

Never reach into the zone. There is danger of bruising as long as parts are still moving.

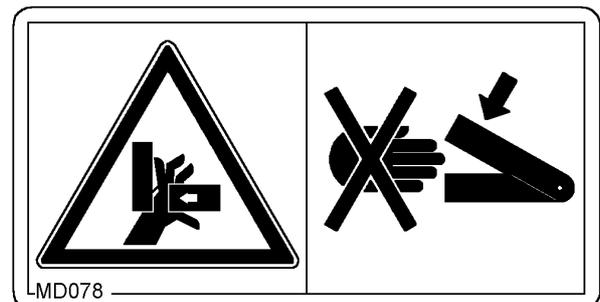


Fig. 7

Explanation for MD081

Before approaching the danger area, secure the lifting ram by locking it.

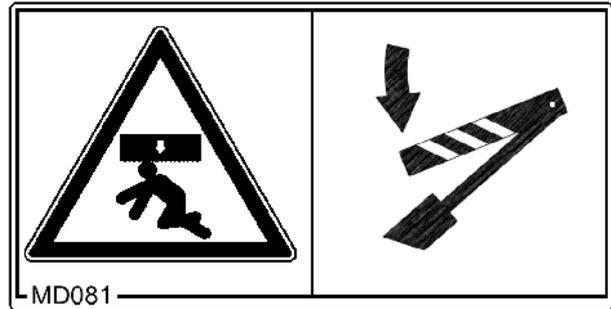


Fig. 8

Explanation for MD082

Sitting or standing on the implement's ladder or platform during operation or during road transport is prohibited.



Fig. 9

Explanation for MD083

Never reach into the seed box, fertiliser box of worm auger. Danger of injury from rotating agitator shaft or filling worm auger.

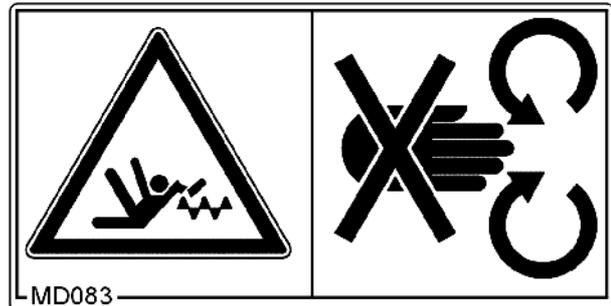


Fig. 10

Explanation for MD084

Never stay within the operational area of the implement.

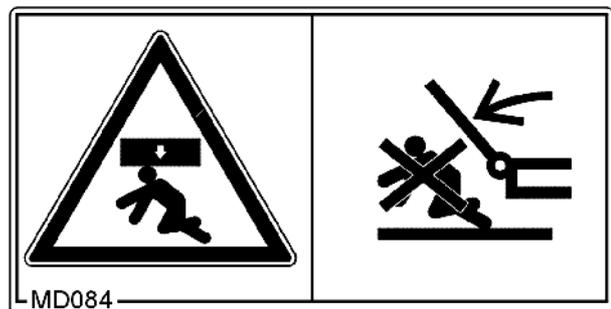


Fig. 11

Explanation for MD086

Before coupling off the tractor pull out the storing supports.

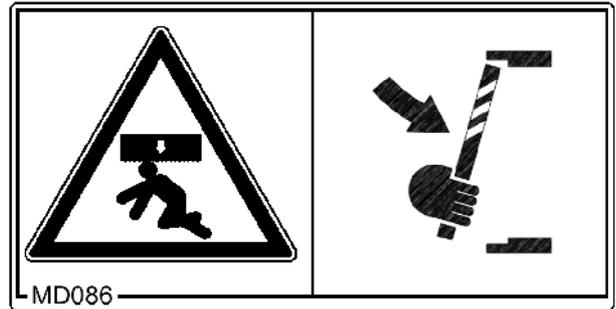


Fig. 12

Explanation for MD089

Do not stand underneath a lifted implement (unsecured load).

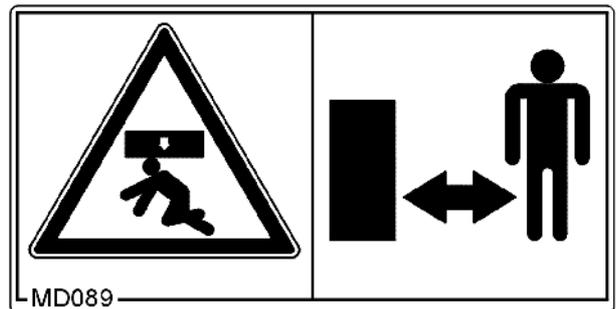


Fig. 13

Explanation for MD093

Danger from rotating implement parts (e.g. pto shaft)!
Never reach into rotating shafts.

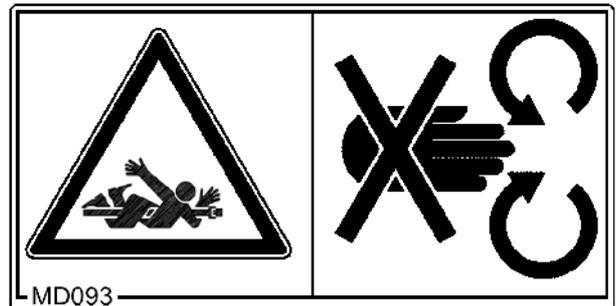


Fig. 14

Explanation for MD094

Ensure sufficient distance to electric high voltage lines.

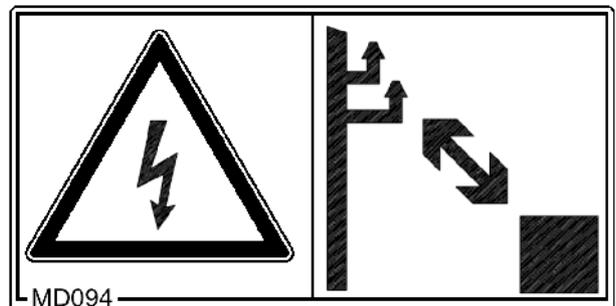


Fig. 15

Explanation for MD095

Before starting operation read and observe instruction manual and safety advice.

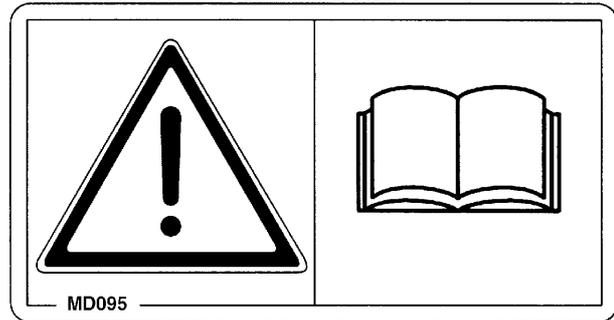


Fig. 16

Explanation for 959967

Retighten bolts after some hours of operation!

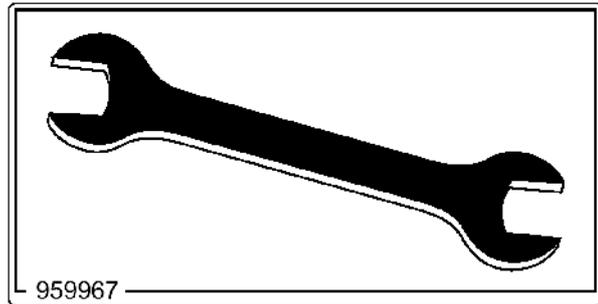


Fig. 17

Explanation for 911888

The CE-sign indicates that the machine meets the EU-guide lines 89/392/EG and the relevant additional guide lines.

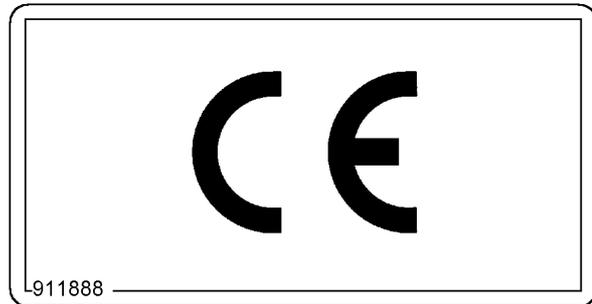


Fig. 18

2.5 Safety conscious operation

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

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

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

2.6 Safety advice for the operator

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

2.6.1 General safety and accident prevention advice

- Adhere to the general rules of health- and safety precautions besides the advice in this instruction manual.
- The fitted warning- and advising decals give important hints for a safe operation; adhering to them protects your own safety.
- When making use of public roads adhere to applicable traffic rules.
- Become acquainted with the machines controls and functions before beginning the operation. Doing this during operation would be too late.
- Avoid wearing any loose clothing that would possibly wrap or catch on moving machinery.
- Avoid danger of fire by keeping the machine clean.
- Before beginning to move, check surrounding area (children etc.). Ensure sufficient visibility.
- Sitting or standing on the implement during operation or during transport is not permissible.
- Attach implements as advised and only to the advised devices.
- Special care should be taken when the implement is coupled to or off the tractor.
- When attaching or removing the machine bring any parking or storing devices into the corresponding position (standing safety).
- Fit weights always to the fixing points provided and as advised for that purpose.
- Adhere to the maximum permissible axle loads, total weights and transport dimensions.
- Fit and check transport gear, traffic lights, warnings and guards.
- The release ropes for quick coupling three point linkages should hang freely and in the lowered position must not release by themselves.
- During driving never leave the operator's seat.
- Moving behaviour, steerability and braking are influenced by mounted implements, trailers and ballast weights. Check sufficient steerability and braking.
- When lifting a three-point-implement the front axle load of the tractor is reduced depending on its size. The sufficient front axle load (20 % of the tractor net weight) has to be observed.
- When driving round bends note the width of the machine and/or the changing centre of gravity of the implement.
- Put implement into operation only when all guards are fixed in position.
- Never stay or allow anyone stay within the operation area of the machine.
- Never stay or allow anyone stay within the pivot and swivel area of the implement.
- Hydraulic folding frames should only be actuated if no persons are staying in the slewing area.
- On all hydraulically actuated pivoting parts exists danger of injury by bruising and trapping.
- Before leaving the tractor lower the machine to the ground. Actuate the parking brake, stop the engine and remove ignition key.
- Allow nobody to stand between tractor and implement if the tractor is not secured against rolling away by the parking brake and/or by the supplied chocks.
- Lock track marker arms in the transport position.
- Observe permissible filling quantities.
- Do not place any foreign elements in the storage hoppers.
- Watch out for hazard points from rotating machine parts during calibration test.
- Use the loading platform for filling operations only. Passengers are not permitted to travel on the platform during operation.

2.6.2 General safety and accident preventive advice for implements mounted to the tractor's three point hydraulics

- Before mounting and dismounting implements to the three-point hydraulics bring all control levers in such a position that an unintended lifting or lowering is impossible.
- When fitting to the three-point linkage the mounting categories on the tractor and the implement must coincide.
- Within the range of the three-point linkage danger of bruising and shearing.
- When actuating the control levers for the three-point linkage never step between tractor and implement.
- In transport position always take care for a sufficient lateral locking of the tractors' three-point.
- For road transport with lifted implement the control lever has to be locked against unintended lowering.
- Mount and dismount implement as prescribed. Check braking systems for function. Mind manufacturer advice.
- Working implements should only be transported and driven on tractors which are designed to do this.

2.6.3 General safety and accident prevention advice regarding the operation of seed drills

- During calibration be aware of the danger created by rotating and oscillating implement parts
- Use platforms only for filling. Standing on them during transport or operation is prohibited!
- Before road transport remove the carriers and marker discs of the pre-emergence marker!
- When filling the seed box observe the hints of the implement manufacturer!
- Lock markers in transport position!
- Do not place any parts into the seed box!
- Observe the permissible filling quantity!

2.6.4 General safety and accident preventive advice when retrofitting electrical and electronic devices and/or components

The implement can be equipped with electronic components and parts the function of which may be affected by electro magnetic transmittance of other implements. Such influences may endanger persons when the following safety advice is not adhered to.

When retrofitting electric devices and/or components on your machine with connection to the on-board-network, the operator/user is responsible for checking whether the installation may cause faults on the tractor electronics or other components.

It has to be observed that the retrofitted electric and electronic parts correspond to the EMV-guide lines 89/336/EU in its valid edition and bear the CE-sign.

2.6.5 General safety and accident preventive advice for PTO shaft drive

- Only use PTO shafts recommended by the manufacturer.
- 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.
- Note the prescribed PTO-shaft tube guards in transport- and operating position.
- Mounting and dismounting PTO shaft only with disengaged PTO shaft, stopped motor and removed ignition key.
- Always care for correct fitting and securing of the PTO shaft.
- Prevent PTO guard from spinning by fixing the provided chains..
- Before engaging the PTO shaft ensure that the chosen PTO-speed of the tractor corresponds to the allowable implement input speed.
- 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.
- Before switching on the PTO shaft nobody is allowed to stay in the area of the spinning PTO-shaft.
- Never switch on the PTO shaft while the engine is stopped!
- When operating with the PTO shaft nobody is allowed to stay in the area of the spinning PTO- or universal joint shaft.
- Always switch off PTO shaft when it is in an adverse position or not needed.
- 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.
- Clean and grease the universal joint shaft and the PTO-driven implement only after the PTO shaft and engine have been stopped and the ignition key removed.
- Deposit removed PTO shaft on the provided carrier.
- After removal of the PTO shaft replace protective cap over the tractor's PTO! Never remove the PTO shaft cap from machine and tractor.
- Remedy of damage is to be undertaken before starting to operate with the implement.

2.6.6 General safety and accident preventive advice for maintenance, repair and cleaning

- Repair-, maintenance- and cleaning operations as well as the remedy of function faults should principally be conducted with drive and engine stopped and disconnected hydraulic joints. Remove ignition key.
- Check nuts and bolts regularly for tightness and retighten if necessary!
- When doing maintenance work on the lifted implement make sure that it is secured by proper supports.
- When changing operating tools with cutting edges use appropriate tools and wear gloves.
- Dispose of oil, grease and filters in the appropriate manner.
- Before doing any repair work on the electric disconnect power supply.
- Before conducting electric welding operations on tractor or on the mounted implement, remove cable from generator and battery.
- 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.

2.6.7 General safety and accident preventive advice when making use of a hydraulic system

- The hydraulic system is under high pressure.
- When connecting hydraulic rams and engines the prescribed connection of the hydraulic hoses has to be noted.
- When connecting the hydraulic hoses to the tractor's hydraulic take care that the hydraulic is free of pressure as well on the tractor- as on the implement side!
- At hydraulic function connections between tractor and implement, the sockets and plugs should be colour coded in order to avoid a contrary function (lifting instead of lowering or vice versa). Danger of accident.
- Regularly check hydraulic hoses and exchange in case of damages or ageing. The replacement hoses have to correspond to the technical demands of the implement manufacturer!
- When searching for leaks appropriate aids should be used due to danger of injury!
- 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!
- Before starting to do any repair work on the hydraulic system, lower implement, relieve system from pressure and switch off the engine!
- All hydraulic hoses must be checked for their operational safety by a skilled person before the first operation of the machine and then at least once a year. In case of damage or ageing replace the hydraulic hoses! The replacement hoses must correspond to the technical demands of the implement manufacturer.
- 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. Precision Airplanters AMAZONE ED 02

The Precision Airplanters ED 02 are available in two versions for working widths of 3 m, 4.50 m, 6 m and 9 m

- as rigid implement
ED 302, ED 452 and ED 602 and
- as folding implement
ED 452-K, ED 602-K and ED 902-K.

On the implements ED 302 and ED 452-K the drive wheels (Fig. 19/1) are located in front of the frame. This allows an individual row placement of the sowing units (10 rows / 3 m) on the profile frame.

The drive wheels can individually be adapted to the tractor track and thus run over a well re-consolidated strip of soil.

All foldable ED 02-implements operate with the parallelogram-folding technique.

On the 6 and 8 row implements the outer sowing units are folded inwards while driving (Fig. 20). Simultaneously the sowing unit drive is switched off.

For an optimum adaptation to the prevailing terrain conditions the 8-row ED 602 K is equipped with a hydraulic track width adjustment.. The drive wheels can be extended for the sowing operation to a track width of 3 m.

On the 12 row implement ED 902-K the three individual segments are stowed parallel above one another when they are folded The unfolded implement rests on the running gear of the outer elements.

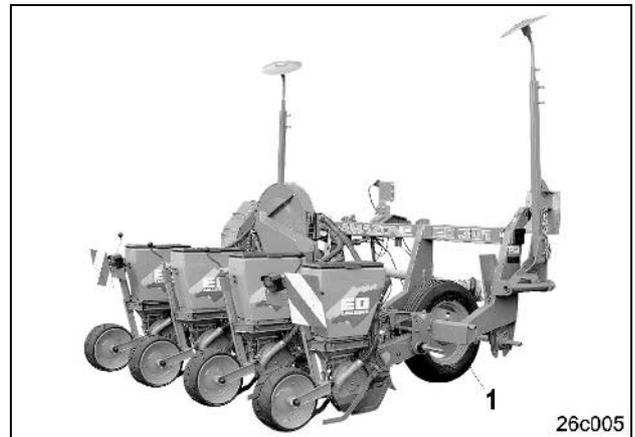


Fig. 19

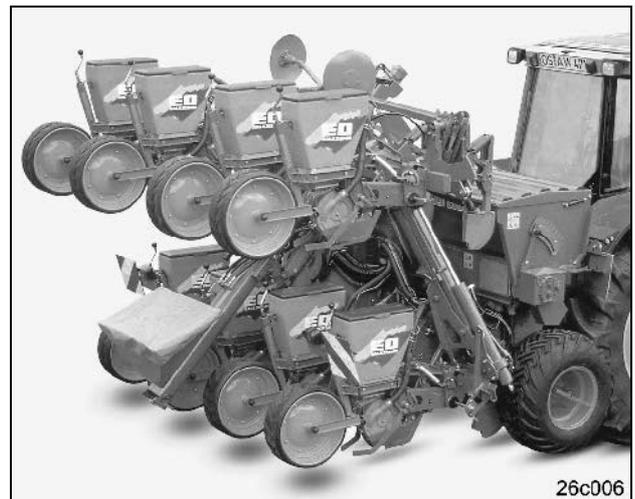


Fig. 20

3.1 Profi sowing units Classic

The Classic-sowing unit (Fig. 21) is suited for sowing maize, soya beans, field beans, bush beans, peas, sunflowers, cotton, sorghum, etc. after ploughing.

For sowing beans and peas the basic implement ED can be equipped with up to 10 sowing units. These can be arranged with equal spacings.

For the seed placement the two coulters types: maize sowing coulters or bean sowing coulters are available at random.



Fig. 21

3.2 Profi sowing unit Contour

The Contour sowing unit (Fig. 22) is suited for conventional sowing, mulch sowing, and also for direct sowing in fields with light soil.

Besides the seeds which can be sown with the Classic sowing unit, with the Contour sowing unit additionally sugar beet and rape can be sown.

The Contour-sowing unit is guided by means of a longitudinal tandem. It rests in the front on a one-sided arranged pre-running pressure roller (Fig. 22/1) and in the rear on a rubber-V-pressure roller (Fig. 22/2) or a flexi rubber tyre.

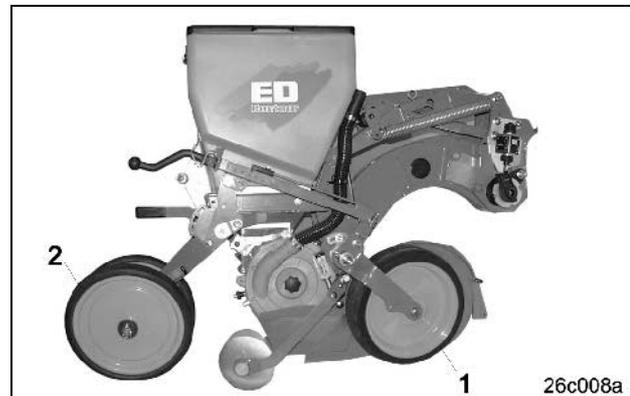


Fig. 22

This way the effects on the individual sowing unit by undulated field surfaces ("contours") are considerably reduced, even at high forward speeds. The very smooth running of the sowing units results in reduced deviations of the desired seed placement depth and in an optimum crop placement. On the Contour sowing unit, large double discs made from wear resistant steel (Fig. 23/1) clear the furrow from organic matter. The seed placement is executed by the sowing coulters (Fig. 23/2). The sowing coulters undercut the furrow bottom of the clearing discs and forms the necessary wedge shaped seed furrow.

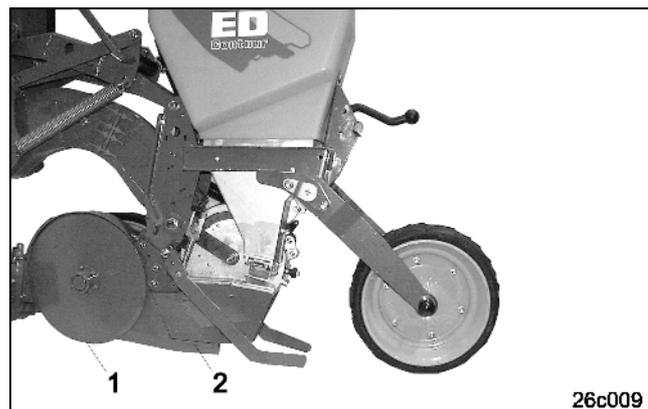


Fig. 23

An easy conversion allows changing from the maize-mulch sowing execution to the relevant sugar beet execution (Fig. 24).

The conversion kit contains an additional intermediate pressure roller (Fig. 24/1), a singling disc and a special coulter point. The quick change system of the sowing coulters allows an easy exchange of the coulter points without riveting.

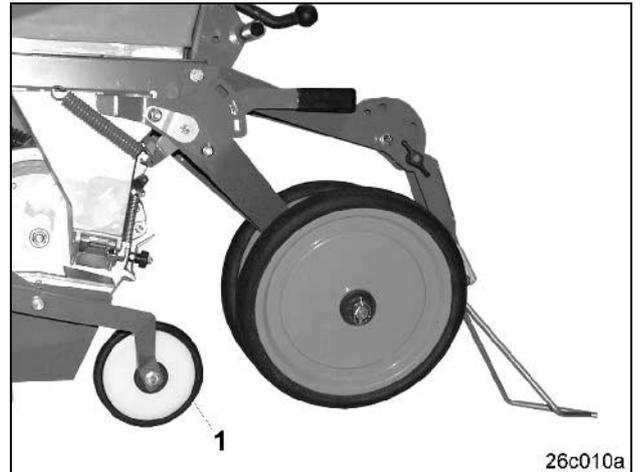


Fig. 24

3.3 Pressure rollers and furrow closers

For the equipment of the sowing units, flexi rubber tyres on ball bearings and rubber V-pressure rollers in different sizes are available. They provide setting the seed placement depth and pressing and covering of the seed furrow.

The flexi rubber tyres (Fig. 25/1) in conjunction with pre-running furrow closers (Fig. 25/2) are used for sowing maize after the plough.

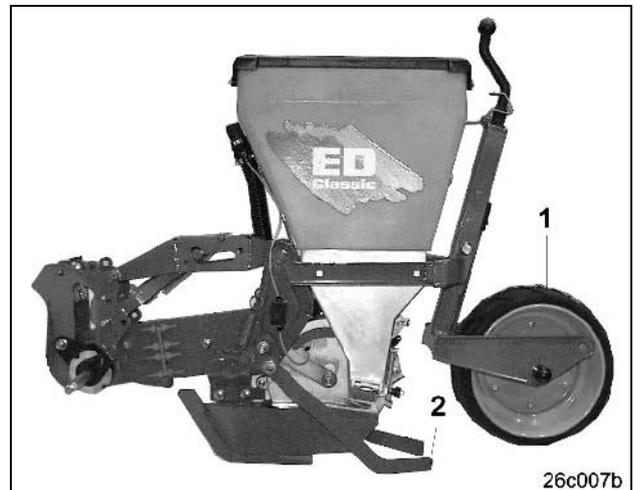


Fig. 25

The rubber V-pressure rollers (Fig. 26/1) operate with and without following furrow closers (Fig. 26/2) as well on ploughed as on mulched fields.

By the rubber V-pressure rollers the seed placement depth is set and the furrow is closed. They are preferably used when mulch sowing for maize and sugar beet.

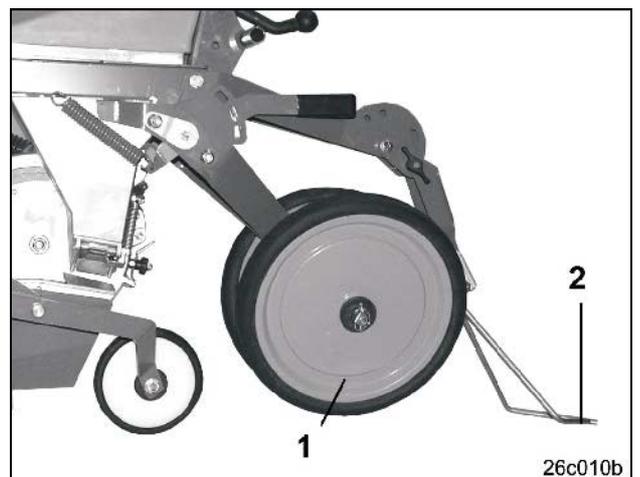


Fig. 26

3.4 Drive sowing units

The singling discs of the sowing units are driven by the drive sprockets (Fig. 27/1) by means of

- the chain drive (Fig. 27/2)
- the 36-step mechanic setting gearbox (Fig. 27/3).
Depending on the singling disc used, seed placement spacings of 3,1 to 53,8 cm can be set in the row.
- the PTO shaft (Fig. 27/4) and
- the secondary transmission with rotation reversing (Fig. 27/5).
Seed placement spacings up to 53,8 cm can be set with the aid of an additional gear.

The power transmission from the sowing unit drive shaft (Fig. 27/6) to the singling discs is provided by the central drive. The central drive consists of sprockets and a roller chain, which are well guarded inserted in the lower link (Fig. 27/7) of the parallelogram guidance..

The drive of the individual sowing unit can be interrupted by pulling the shear pin out of the coupling flange and the coupling. The shear pin can be safely deposited in the provided gap in the coupling flange (Fig. 28/1).

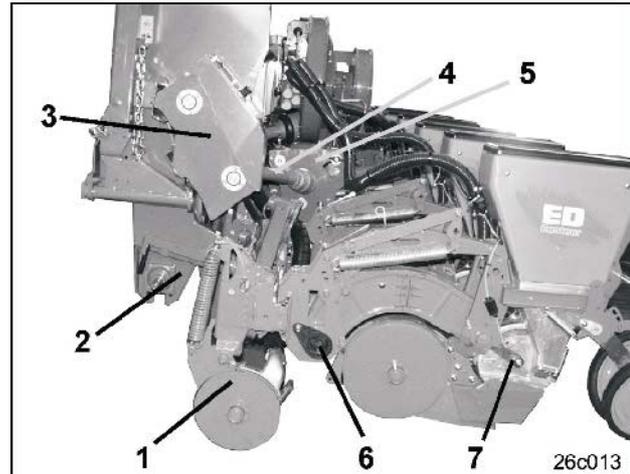


Fig. 27

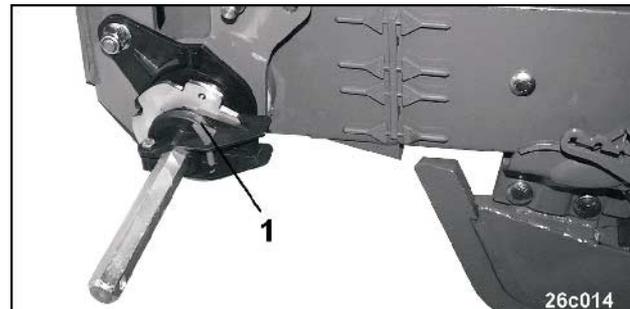


Fig. 28

The individual sowing units can be switched off with the aid of a lifting magnet (Fig. 29/1) which is fitted on the sowing unit.

The lifting magnet engages in the wrap spring (Fig. 29/2). The drive of the sowing unit is interrupted..

These lifting magnets are electronically controlled via ED-Control and can be fitted to every sowing unit.

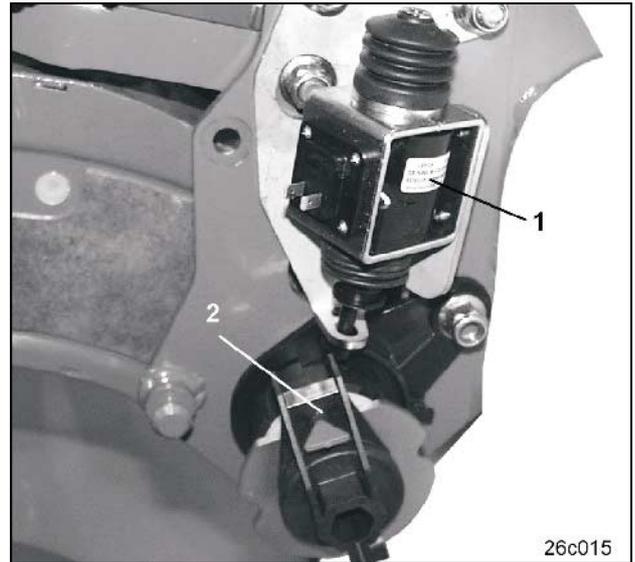


Fig. 29

3.5 Over load securing

The integrated overload securing protects the sowing units from damage.

Overload damages the shear pin (Fig. 30/1) on coupling flange and coupling disc. Then the drive connection towards the singling disc would be interrupted.

Each eight spare shear pins are attached to every sowing unit (Fig. 30/2).

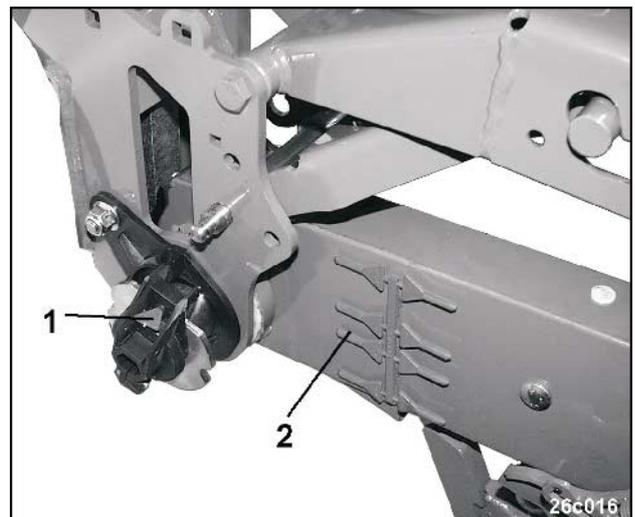


Fig. 30

3.6 Suction blower fan

The suction blower fan (Fig. 31/1) can be driven by means of a PTO shaft drive (Fig. 31/2) can be driven by means of a PTO shaft drive.

As standard up to 18 sowing units can be fitted to the blower fan.



Fig. 31

3.7 Singling

The seed is delivered via the feeding device (Fig. 32/1) to the singling disc (Fig. 33/1).

The seed singling operates according to the air suction principle. The vacuum created by the suction blower fan sucks the seed grains from the seed hopper into the nap holes of the singling discs and guides them to the scraper (Fig. 32/2).

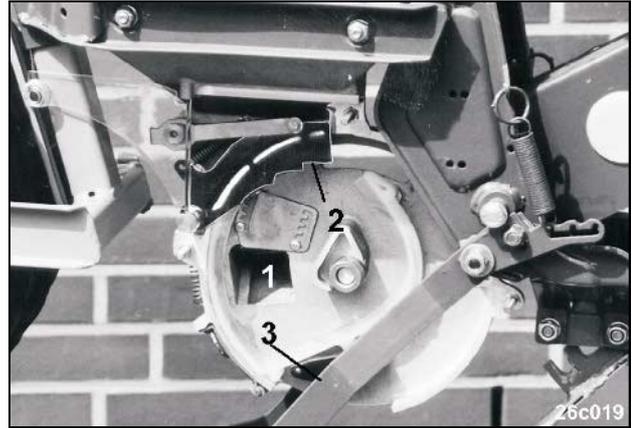


Fig. 32

The scraper (Fig. 32/2) which can be set in five positions singles the seed grains sucked onto the nap holes. Redundant grains fall back into the seed hopper.

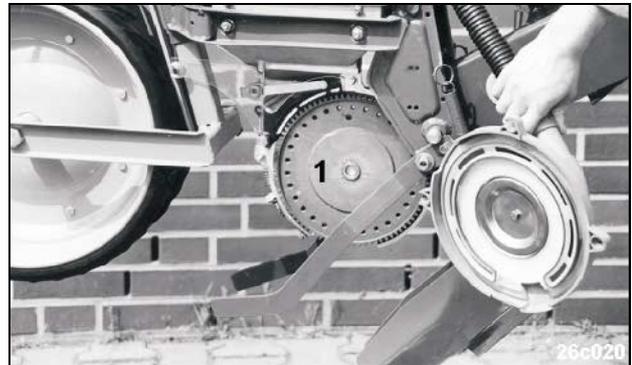


Fig. 33

The singled seed grains are guided through the seed housing towards the discharge opening. When the grain has arrived the deepest point the vacuum is interrupted. The grain falls off the nap of the singling disc directly into the seed furrow created by the sowing coulters. The height of fall "a" (Fig. 34) is 100 mm on the Classic sowing unit and 140 mm on the Contour-sowing unit.

The spring loaded ejector carefully loosens the grains which might have been clamped in the nap holes and frees the holes for a new supply.

Various easily exchangeable polyethylene singling discs (special option) are available for the different types of seed.

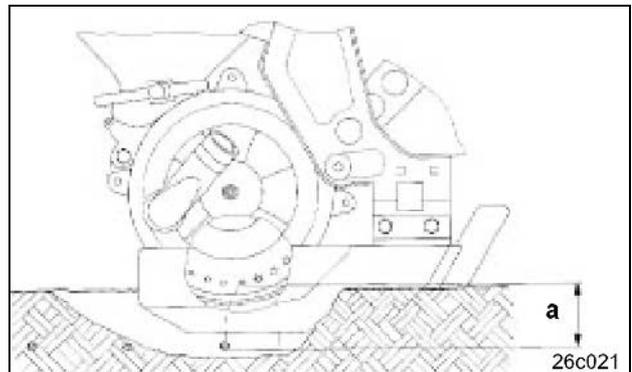


Fig. 34

3.8 Row fertiliser applicator

The centre of gravity of the large, undivided fertiliser hopper (Fig. 35/1) is closely behind the tractor.

Easy to be stepped on loading boards or the filling worm auger (Fig. 35/2) allow an easy and quick filling of the fertiliser hopper.

With the filling worm auger the hopper can be filled within a short time without any dust development.

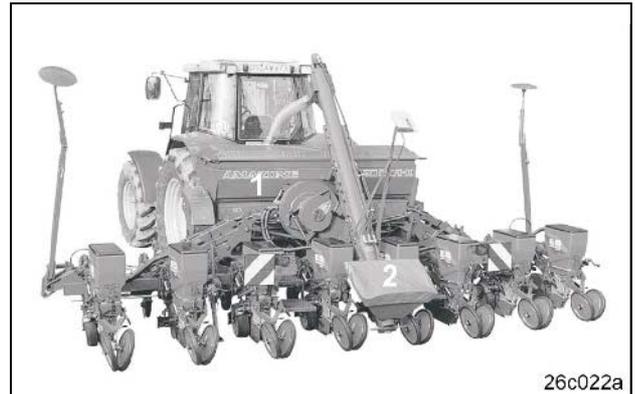


Fig. 35

The large filling opening (Fig. 36) facilitates the filling of the fertiliser applicator by big bags or a front shovel loader.



Fig. 36

The fertiliser applicator is driven by the infinitely variable setting gearbox (Fig. 37/1). Fertiliser rates of 50 to 550 kg/ha can be applied.

Special fertiliser metering wheels deliver the fertiliser into the outlets of the fertiliser coulters (Fig. 37/3).

The fertiliser metering area (Fig. 37/2) is protected from rain.



Fig. 37

With a trapezoidal suspension (Fig. 38/2) the fertiliser coulters (Fig. 38/1) are fixed on the profile rail (Fig. 38/3). This allows the fertiliser coulters to give way upwards and to the rear when hitting stones.

The fertiliser placement depth can be set without any tool by resetting the pin (Fig. 38/4).

By the trapezoidal suspension of the fertiliser coulters the maintaining of the pre-set fertiliser placement depth is ensured – even in case of heavily changing soil conditions or varying forward speeds.

The highly wear resistant fertiliser coulters can be turned if one half is worn off.

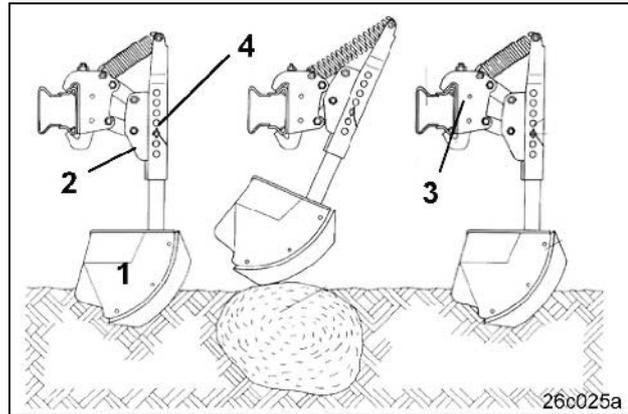


Fig. 38



The AMAZONE-fertiliser coulters open the soil until the coulters point to the full profile width. Only this way the fertiliser can be placed at the base..

For very stony and heavy soils as well as for large placement depths the double disc fertiliser coulters (Fig. 39/1) is available.

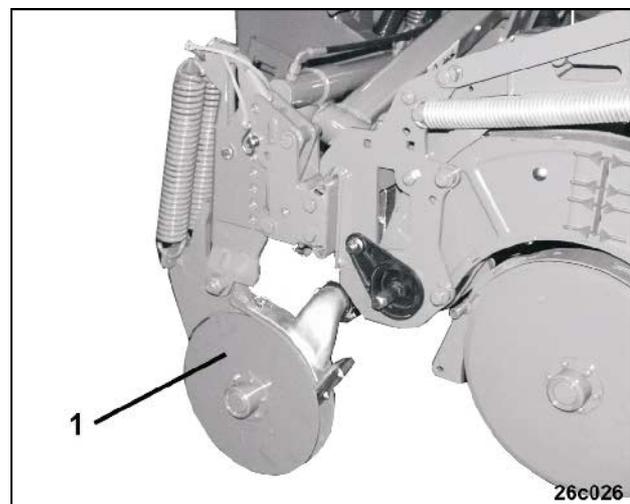


Fig. 39

By means of the fertiliser quick emptying device (Fig. 40, special option) the fertiliser residue in the fertiliser hopper can easily flow into a collecting tray placed underneath.



Fig. 40

3.9 Front tank



The ED 902-K is exclusively designed for combined fertilising with the front tank FRS (Fig. 41).

All other ED-types can at random be equipped with either the rear mounted row fertiliser applicator or the front tank FRS.



Fig. 41

3.10 Foldable implements ED 602-K and ED 902-K

Folding in and out the sowing units, and marker arms as well as the drive of the filling auger and the star wheel actuation of the front tank can be controlled from the tractor cab via

- control units (standard marker arm folding),
- AMASCAN Profi (Fig. 42 and Fig. 43)
- ED-Control (Fig. 44).

This way also a part section and tramlining control can be achieved.

3.11 Electronic monitoring and control with AMASCAN and AMASCAN Profi

AMASCAN (Fig. 42) and

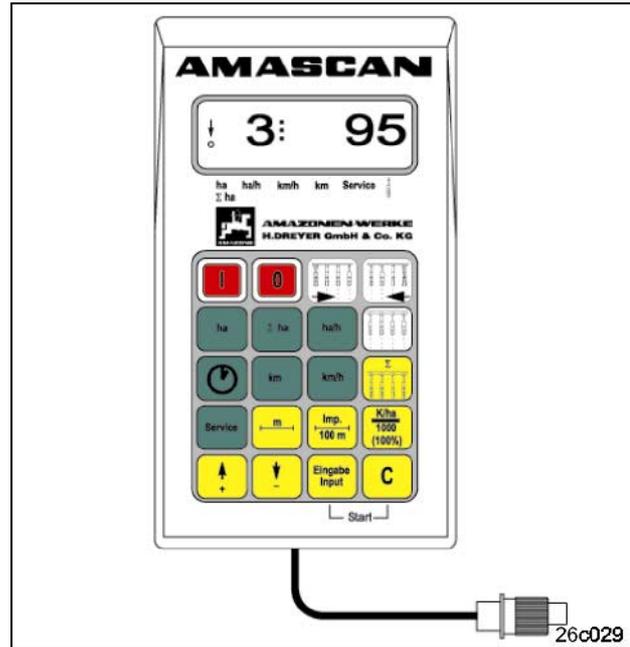


Fig. 42

AMASCAN Profi (Fig. 43) are display- and monitoring devices.

In conjunction with the opto sensors they monitor the sowing unit drive and the grain supply on the singling discs.

During operation the sown number of grains per hectare is displayed.

In case of deviations from the given actual value a honk sounds. In addition a visible signal is shown on the display.

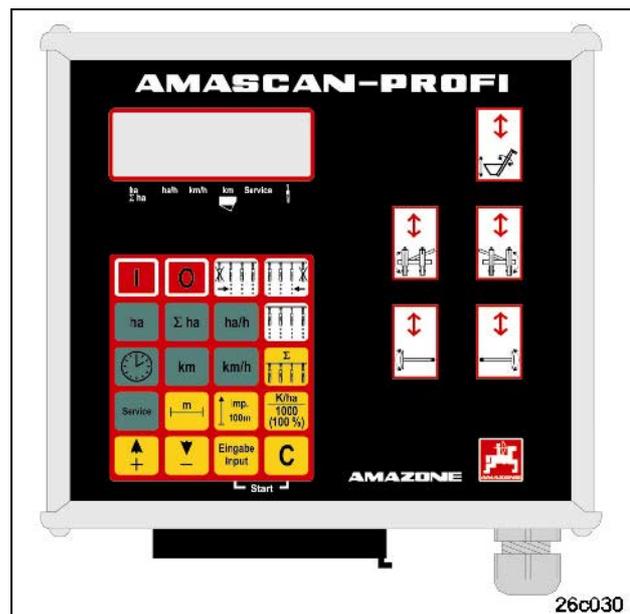


Fig. 43

3.12 Electronic monitoring and control with ED-Control

ED-Control (Fig. 44) is an implement specific terminal and covers all function of the AMASCAN-Profi.

In addition a program for tramlining control and for individual sowing unit switch off is integrated.

ED-Control controls all hydraulic functions including the star wheel actuation on front tank combinations.

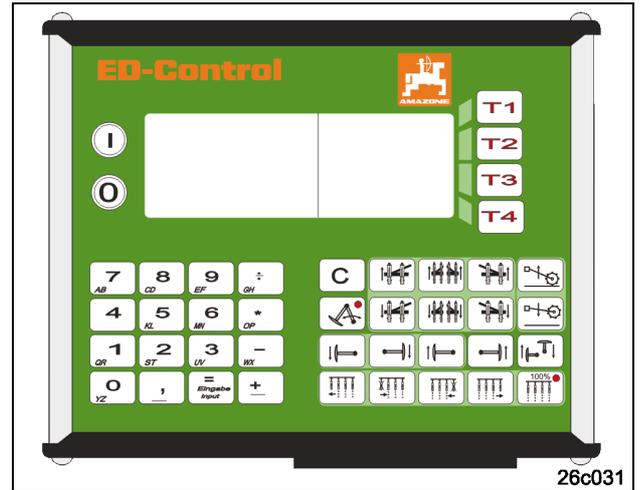


Fig. 44

4. Mounting and dismounting

4.1 Mounting

Mount the ED to the rear three point hydraulics of your tractor (please refer to para. "Safety and accident prevention advice for mounted implements").

Fix the lower link arms of the tractor to the lower link pin (cat. II) (ED 902-K cat. III).

Reset top link with inserting pin (cat. II) and secure (ED 902-K [cat. III]).



Only use the upper link with locked eyes.!



Set the top link arm length in such a way that, when the implement is lowered (working position), the seed hopper covers of the sowing unit will be level with the ground when the sowing coulters are penetrating the soil.

Only with this setting the sowing coulters is properly guided in the soil and a faultless, even seed placement will be achieved.

When the implement is mounted, fold in the support stands (Fig. 45/1) and secure.



Fig. 45

The lower link arms of the tractor three point hydraulics must be equipped with stabilising bracings or chains. In lifted position the lower link arms of the tractor may only have little lateral play so that the implement always follows the tractor in its track centre during sowing operation. This way, also in hilly terrain an even row spacing towards the next bout is achieved and when turning at the headlands the swinging of the raised Airplanter is avoided.

4.1.1 Mounting data

Before starting to operate determine the total weight, the axle loads and the load capacity of the tyres as well as the necessary minimum ballast of the combination tractor/mounted implement as described in para. "4.1.2".

Please take the necessary data from figure (Fig. 46) and the tables (Fig. 47 and Fig. 48).

The distance "a" results from the sum of the distances a_1 and a_2 .

a_1 = Spacing between centre of front axle and lower tractor linking point. Please take this value from the instruction manual of your tractor.

a_2 = Spacing between centre of lower tractor linking point and point of gravity front mounted implement. Please take this value from table (Fig. 47).

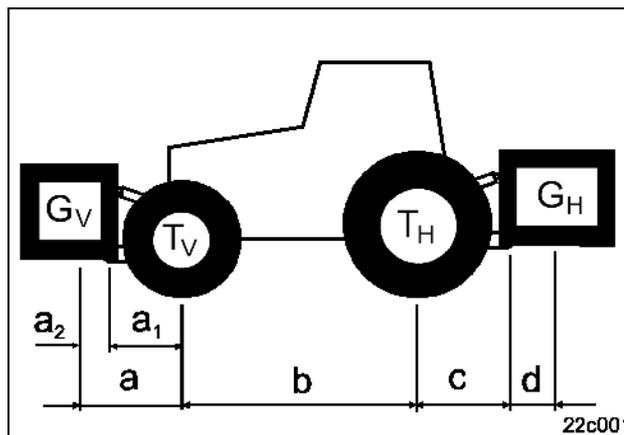


Fig. 46

Front packer seed tank	FPS 103 FPS 203
Distance a_2	0,8 m

Fig. 47

ED 902-K	with under root fertilising				without under root fertilising			
	18-row Contour	18-row Classic	12-row Contour	12-row Classic	18-row Contour	18-row Classic	12-row Contour	12-row Classic
	$G_H = 4490$ kg	$G_H = 3780$ kg	$G_H = 3564$ kg	$G_H = 3227$ kg	$G_H = 3880$ kg	$G_H = 3335$ kg	$G_H = 3312$ kg	$G_H = 2975$ kg
Distance d	950 mm	900 mm	850 mm	800 mm	1000 mm	950 mm	900 mm	850 mm

Fig. 48

4.1.2 Determination of the total weight, the axle loads and the load capacity of the tyres as well as the necessary minimum ballast of the combination tractor/mounted implement



When mounting implements to the front or rear three point linkage the permissible total weight, the permissible axle loads and the load capacity of the tractor's tyres must not be exceeded.

Always check that the necessary front axle load of the tractor (20 % of the tractor's net weight) is maintained.

Before purchasing the implement ensure that these pre-conditions are fulfilled by making the following calculations or by weighing the tractor implement combination.

For calculation the following data are required (please also refer to Fig. 49):

- T_L [kg] Net weight of the tractor ❶
- T_V [kg] Front axle load of the empty tractor ❶
- T_H [kg] Rear axle load of the empty tractor ❶
- G_H [kg] Total weight rear mounted implement / rear ballast ❷
- G_V [kg] Total weight front mounted implement/front ballast ❷
- a [m] Spacing between point of gravity front mounted implement / front ballast and centre of front axle ❷❸
- b [m] Wheel base of tractor ❶❸
- c [m] Spacing between centre of rear axle and centre of lower link ball ❶❸
- d [m] Spacing between centre lower link ball and point of gravity rear mounted implement / rear ballast ❷

- ❶ Please refer to instruction manual for the tractor
- ❷ Please refer to price list and/or instruction manual of the implement
- ❸ Dimensions

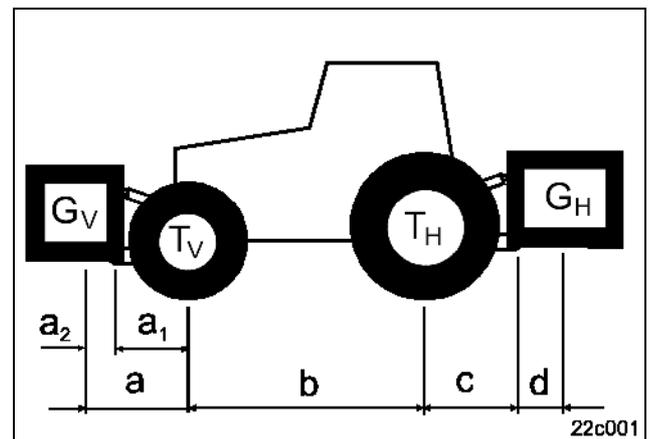


Fig. 49

4.1.3 Rear mounted implement or front-rear mount combinations

Calculation of the minimum ballast front $G_{V \min}$

$$G_{V \min} = \frac{G_H \cdot (c + d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a + b}$$

Enter into the table (Fig. 50) the minimum ballast required for the tractor front.

4.1.4 Front mounted implement

Calculation of the minimum ballast at the rear $G_{H \min}$

$$G_{H \min} = \frac{G_V \cdot a - T_H \cdot b + x \cdot T_L \cdot b}{b + c + d}$$

Enter into the table (Fig. 50) the calculated minimum ballast which is required in the rear of the tractor. For "x" please see details of the tractor manufacturer. In case no data are given: "x"= 0,45.

Calculation of the actual front axle load $T_{V \text{tat}}$

If the necessary minimum ballast front ($G_{V \min}$) is not achieved with the front mounted implement (G_V), increase the weight of the front mounted implement up to the weight of the minimum ballast front.

$$T_{V \text{tat}} = \frac{G_V \cdot (a + b) + T_V \cdot b - G_H \cdot (c + d)}{b}$$

Enter into the table (Fig. 50) the calculated actual front axle load and the permissible axle load indicated in the instruction manual of the tractor.

Calculation of the actual total weight G_{tat}

If the minimum rear ballast ($G_{H \min}$) is not achieved with the rear mounted implement (G_H), increase the weight of the rear mounted implement up to the minimum ballast.

$$G_{\text{tat}} = G_V + T_L + G_H$$

Enter into the table (Fig. 50) the calculated actual total weight and the total weight indicated in the instruction manual of the tractor.

Calculation of the actual rear axle load $T_{H\ tat}$

$$T_{H\ tat} = G_{tat} - T_{V\ tat}$$

Enter into the table (Fig. 50) the calculated actual rear axle load and the rear axle load indicated in the instruction manual of the tractor.

Calculation of the tyre load capacity

Enter into the table (Fig. 50) double the value (two tyres) of the permissible tyre load capacity (please refer, e.g. to the files of the tyre manufacturer).



The minimum ballast must be attached to the tractor by means of a mounted implement or a ballast weight.

The calculated values should be smaller than /equal (\leq) the permissible values.

TABLE	Actual value according to calculation	Permissible value according to instruction manual	Double permissible tyre load capacity (two tyres)
Minimum ballast Front / rear	/ kg	---	---
Total weight	kg	kg	---
Front axle load	kg	kg	kg
Rear axle load	kg	kg	kg

Fig. 50

4.2 PTO shaft with free wheel

The counter shaft gearbox of the blower fan is driven via the universal joint shaft by the PTO shaft of the tractor.



Only use the PTO shaft with free wheel supplied by the manufacturer.

4.2.1 Matching and fitting the PTO shaft

Push the PTO shaft halves in the prescribed sense of direction (please refer to symbol on the PTO shaft) onto the PTO shaft connection of your tractor and onto the PTO shaft stud of the Airplanter ED.



When fitting for the first time or when changing tractors, match the PTO shaft to your tractor

Before doing this, clean the PTO shaft stud of your implement.

When first mounting, fix PTO shaft halves to the universal joint shaft profile of the tractor and the implement without inserting the PTO shaft tubes into one another.

1. By holding the PTO shaft tubes side by side, check whether a profile overlap of the PTO shaft tubes of at least 40 % of LO (LO = length in inserted condition) is guaranteed as well on the lowered as on the lifted implement.
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 the guard tube.
6. Deburr cutting edges and carefully remove chips.
7. Apply grease to the profile tubes and insert.
8. Hook in chains 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.

Also note the fitting- and maintenance advice of the PTO shaft manufacturer.

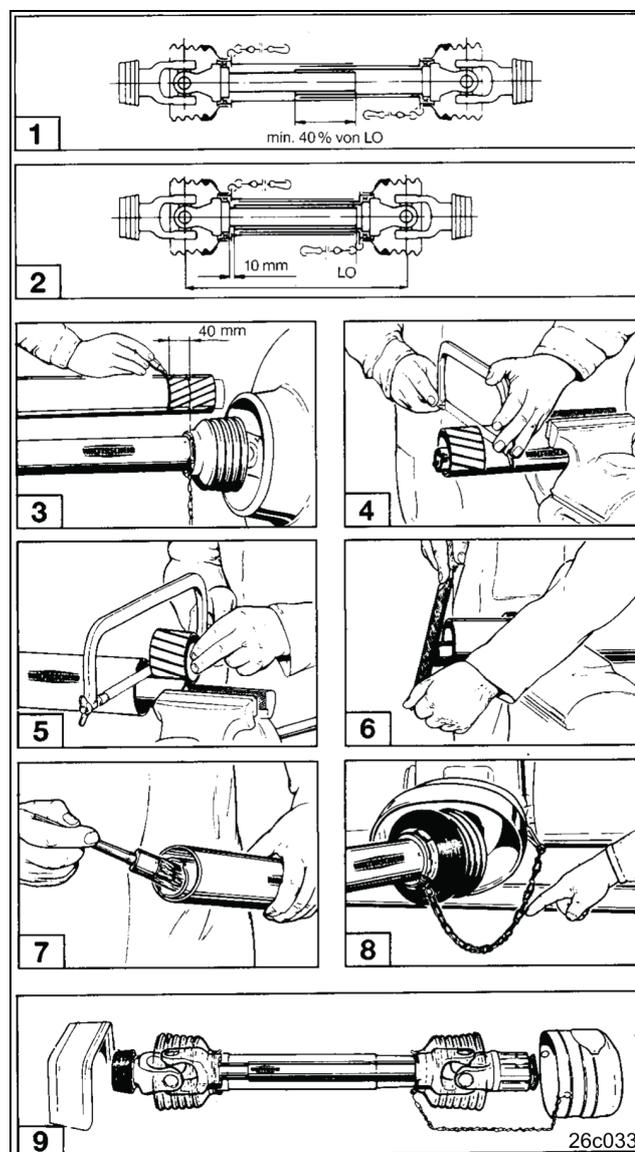


Fig. 51



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.



In case you operate your Airseeder in combination with a soil tillage implement and a packer roller and the Air-seeder is lifted with the aid of a lifting frame over the packer roller to reduce the lifting power when the total combination is raised, a lifting power limiting device should be provided on the soil tillage implement so that the angling of one universal joint of the PTO shaft will not exceed 30°.



To avoid damage to universal joint shaft and blower fan only engage the PTO shaft slowly at low tractor engine speed.

4.3 Drive of the blower fan with different PTO shaft speeds

The blower fan (Fig. 52/1) is driven via the V-belt drive (Fig. 52/2) by means of the PTO shaft from the tractor's universal joint shaft.

V-belt pulleys (Fig. 52/3) with different diameters "D" allow the counter gearbox input shaft (Fig. 52/4) to be driven with different tractor universal joint shaft speeds without changing the blower fan speed.

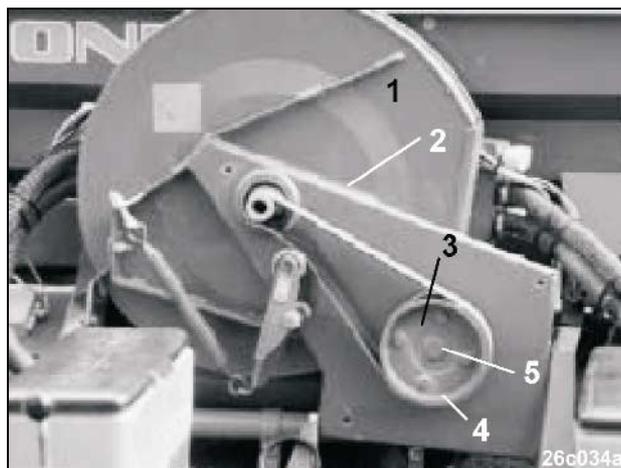


Fig. 52



The guard (Fig. 52)) of the counter gearbox has been removed for demonstration purpose.

Only operate the machine with properly fitted guards.



For fixing the V-belt pulley, only use bolts with elastic bolt safety (e.g. Loctite).

4.3.1 V-belt pulleys for different PÜTO shaft speeds

PTO shaft speed	1000 R.P.M.	710 R.P.M.	540 R.P.M.
PTO shaft speed	1000 R.P.M.	1000 R.P.M. and reduced tractor engine speed	540 R.P.M.
V-belt pulley	$\varnothing = 178 \text{ mm}$	$\varnothing = 250 \text{ mm}$	$\varnothing = 330 \text{ mm}$
Securing the V-belt pulley	only use new bolts and secure using Loctite.		
Belt length "L"	L = 1105 mm	L = 1244 mm	L = 1397 mm
Spring length "l" (see Fig. 54)	l = 240 mm	l = 260 mm	l = 260 mm

Fig. 53

4.3.2 Exchange of V-belt pulley

The pulley (Fig. 54/1) is fitted on the driven input shaft (Fig. 54/3) of the counter shaft with four bolts (Fig. 54/2). The V-belt (Fig. 54/4) connects pulley with the blower fan drive shaft (Fig. 54/5). The belt is tensioned by the sprung loaded roller (Fig. 54/6).



The belt tensioning depends on the V-belt pulley diameter "d" and the spring spring length "l" (see Fig. 55)!

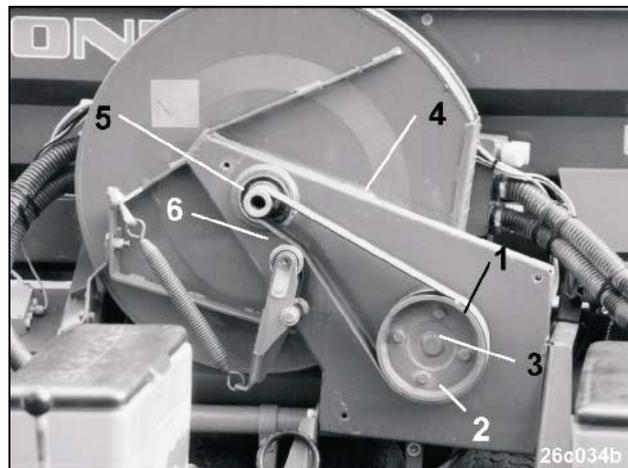


Fig. 54

Exchange V-belt pulley on ED with suction fan:

- Remove three bolts and take off guard.
- Release V-belt pre-tensioning and remove V-belt.
- Slacken bolts and exchange the V-belt pulley.
- Use new bolts with locking device (Loctite)



Adjust spring length "l" (Fig. 55) according to table (Fig. 53).

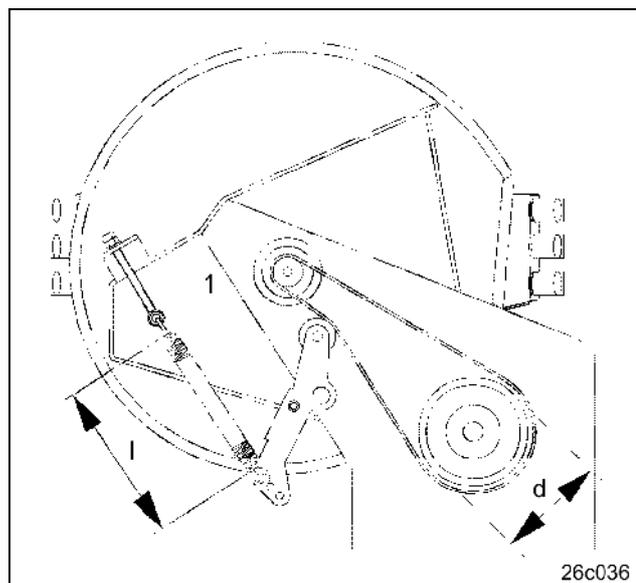


Fig. 55

Exchange V-belt pulley on ED with air pressure and suction blower fan:

- Slacken the 4 bolts in the fixing plate (Fig. 56/1) of the pressure air fan and remove the fixing plate.
- Slacken the bolt connections and remove the 3-sectioned guard (Fig. 56/2)
- Release the V-belt pre-tensioning and remove the V-belt.
- Slacken bolts (Fig. 56/2) and exchange V-belt pulley.
- Carry out the mounting in reverse order:



Pretension the spring "I" on the correct length according to table (Fig. 53).

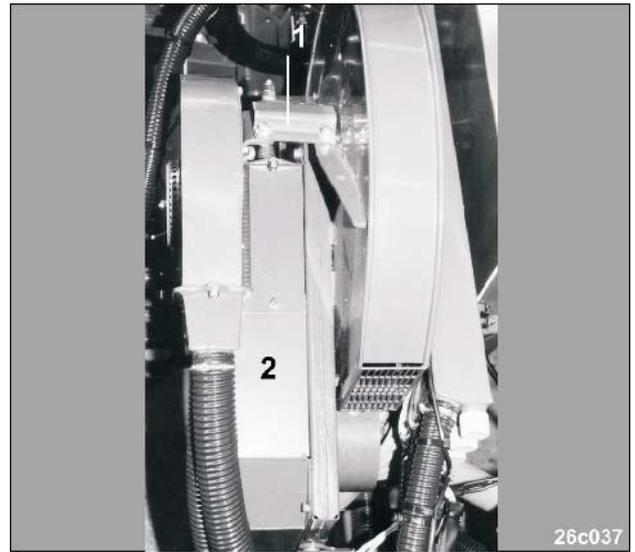


Fig. 56



The exchange of the V-belt pulley requires a V-belt of another length (see table Fig. 53).



Only start to operate the implement with all guards fitted and in proper position.

4.4 Hydraulic connections for rigid implements

Connect the hydraulic plug of the marker arm folding to 1 single acting control spool valve

4.5 Hydraulic connections for foldable implements

Type	Marker arms		Track markers		Valves required on tractor
	right hand	left hand	right hand	left hand	
Series ED 452-K					
without marker actuation	1 DA		/	/	1 DA
with vertical marker arm folding	1 DA		1 SA		1 DA / 1 SA
ED 452-K* w. control unit 918469	coupled (manual selection)		1 DA		1 DA
ED 452-K* with individual marker arm folding 918452	1 DA	1 DA	1 SA		2 DA / 1 SA
ED 452-K* with individual marker arm folding 918452 and control unit 918469	individual (manual selection) 1DA		1 SA		1 DA / 1 SA
ED 602-K* serial execution	1 DA		1 SA		1 DA / 1 SA
ED 602-K* with control unit 918469	coupled (manual selection)		1 DA		1 DA
ED 602-K* with individual boom folding 917830	1 DA	1 DA	1 SA		2 DA / 1 SA
ED 602-K* with individual marker arm folding 917830 and control unit 918469	individual (manual selection) 1 DA		1 SA		1 DA / 1 SA
ED 602-K* with profi control 921716	with electr. hydr. valve block				1 SA / 1 F
ED 602-K* with profi control S 921718	(all functions can be controlled individually)				
ED 902-K* serial execution	1 DA / 1 F		1 SA		1 DA / 1 SA
ED 902-K* with profi control 925007	with electr. hydr. valve block (all functions can be controlled individually)				1 SA / 1 F
On machines with front tank additional connections are required					
Front tank FRS / FPS 103 and FRS / FPS 203 serial execution	1 SA (blower fan)		1 SA (blower fan)		2 SA / 1 F
Front tank with star wheel lifting for profi control 925008	1 SA (blower fan)				1 SA / 1 F
DA = double acting hydraulic valve SA = single acting hydraulic valve F = free return flow to the tank Profi-folding only possible on tractors with load-sensing systems or separate oil circuit On machines which are equipped with a filling auger, an additional double acting spool valve is required.					
* with vertical marker arm folding					

Required oil quantity when operating with a front tank

Profi control
the hydraulic system of the tractor must provide a volume of at least 20 l/min.

Profi control S:
If it is intended to operate with the maximum worm auger capacity the hydraulic system of the tractor must provide a volume of 45 l/min.



In case of problems regarding the lifting time of the implement when turning at the headlands, operate with reduced worm auger capacity. For this reduce the volume of 45 l/min. to e. g. 30 l/min. or change the worm auger capacity each time.

When operating with a front tank note that just for the blower fan drive of the front tank an oil volume of approx. 30 l/min. is required.

4.6 Foldable implements with Profi control

Required on the tractor:

- one single acting control unit for connection of the pressure hose (Fig. 57/P).
- one pressure less return flow for connection of the return flow hose (Fig. 57/T).

Required oil quantity for profi control:

The hydraulic system of the tractor must provide a volume of at least 20 l/min.

Required oil quantity for profi control S:

If it is intended to operate with the maximum worm auger capacity the hydraulic system of the tractor must provide a volume of 45 l/min.



Profi-folding only possible on tractors with load-sensing systems or separate oil circuit.



In case of problems regarding the lifting time of the implement when turning at the headlands, operate with reduced worm auger capacity. For this reduce the volume of 45 l/min. to e. g. 30 l/min. or change the worm auger capacity each time.

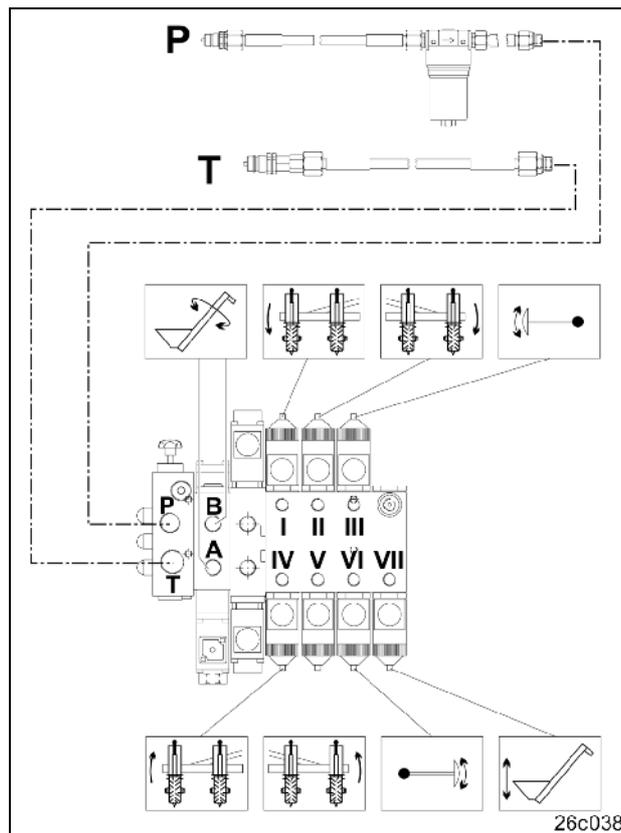


Fig. 57



For road transport switch off the hydraulic drive.!

In order to avoid damage to the hydraulic components the impact pressure in the return flow must not exceed a maximum of 10 bar.

Therefore, do not connect the oil return flow to the control spool valve but on a pressure less oil return flow.

Only use the supplied plug coupling.

4.7 Setting the system-conversion bolt on the valve block

The adjustment of the system conversion bolt on the valve block depends on the tractor's hydraulic system. In accordance with the hydraulic system proceed as follows:

Unscrew the system converting bolt until the lock (set by the factory) on tractors with

- an open centre hydraulic system (constant flow system, chain wheel pump hydraulic).
- a load-sensing-hydraulic system (pressure- and flow controlled setting pump) – set the oil delivery with the aid of the control unit to approx. 45 l/min.

Screw in the system converting bolt until the lock (contrary to the factory setting) on tractors with

- a closed-centre-hydraulic system (constant pressure system, pressure controlled setting pump) and
- a load-sensing-hydraulic system (pressure- and flow controlled setting pump) with direct load sensing pump connection (control circuit).

4.8 Uncoupling the implement



When coupling or uncoupling park the implement on level ground.

Couple or uncouple the implement only when it is empty.

Before coupling the implement pull out the support stands (Fig. 58/1) and secure with a spring loaded pin (Fig. 58/2)

Only park the ED 902-K by using the support stand (available as special option) after the implement has been folded.

In standard execution the ED 902-K can only be parked when it has been unfolded.



For parking the unfolded ED 902-K fold down the supports (Fig. 59) on the outer arms.

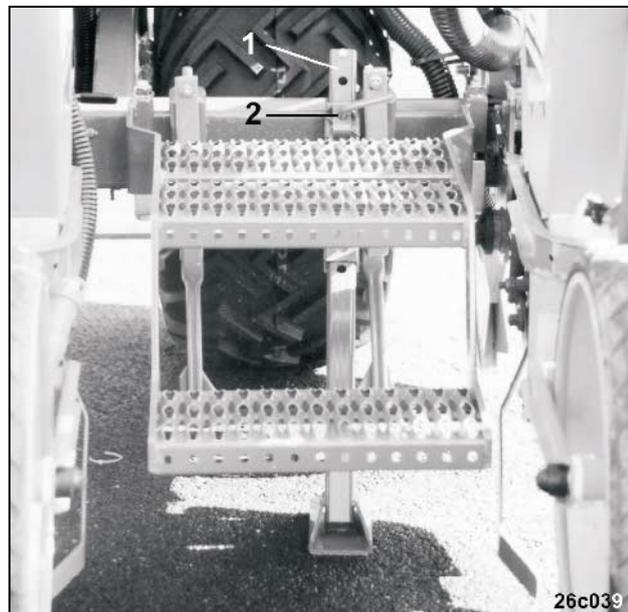


Fig. 58

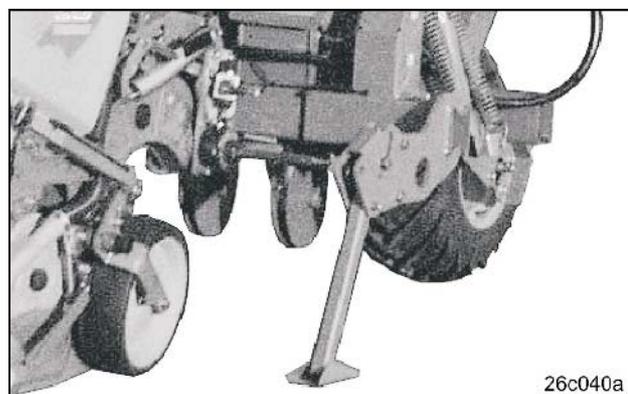


Fig. 59



Only park the ED 902-K with empty seed hopper on the support stand.

In order to achieve a safe parking of the implement ensure that the support stand is positioned on a paved level ground (max. gradient 3°).

The implement must rest in the provided retainers on the support stands. (Fig. 60/2).

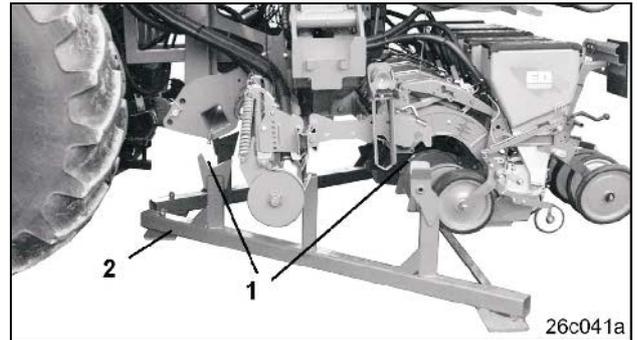


Fig. 60



Shut block (if available) tap for the filling auger and for the marker arm folding before uncoupling the implement.

Insert the hydraulic plug into the provided plug retainer.

5. Settings

5.1 Setting the row spacings

The spacings between the sowing units can be infinitely variably set.

On implements with Classic sowing units with 32 litre seed hopper row spacings larger than 30 cm can be set.

On implements with Contour sowing units row spacings larger than 40 cm can be set.

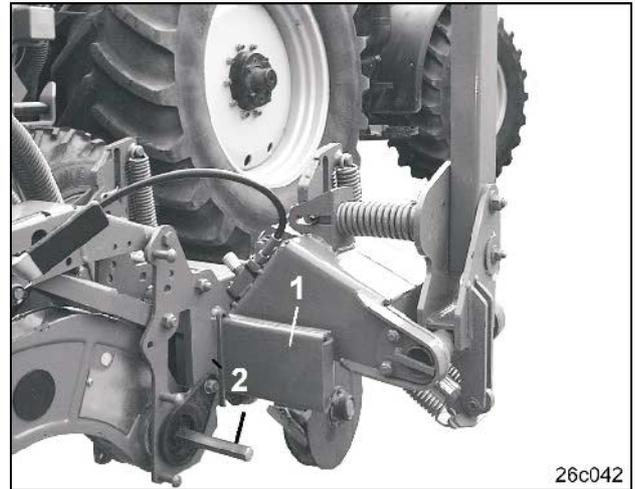


Fig. 61

For setting the row spacing

- Slacken the hex. bolt on the coupling flange (Fig. 62/1) of the relevant sowing unit.
- If necessary, pull out the hexagon shaft (Fig. 62/2).

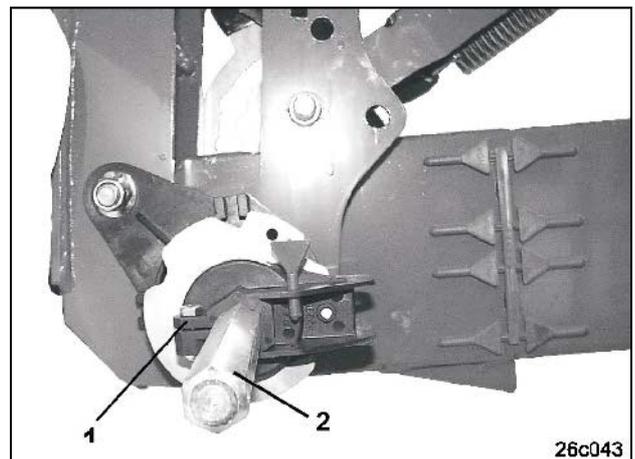


Fig. 62

- Slacken the nuts (Fig. 63/1) of the fixing clamps. Move the sowing units on the clamping rail (Fig. 61/1) as desired.
- Tighten nuts (Fig. 63/1).
- Fit hexagon shaft (Fig. 62/2), if it had been pulled out.
- Secure hex. bolts on the coupling flange (Fig. 62/1) of the relevant sowing unit.

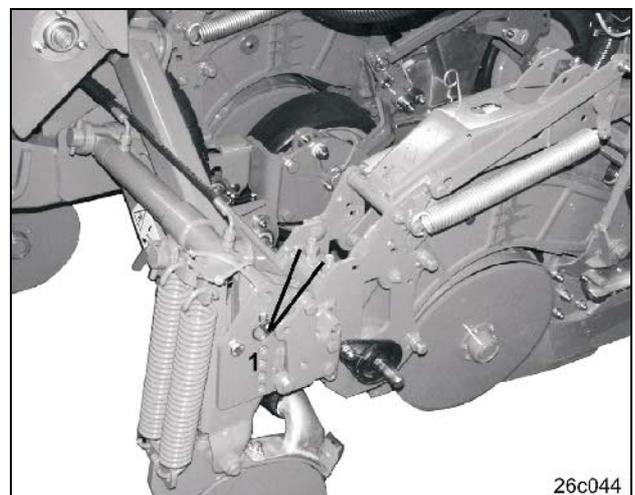


Fig. 63



Recheck bolts for firm seat after two working hours.

5.1.1 Reihenabstände ED 02 Classic Säaggregate

Possible row spacings ED 02 Classic sowing units							
Number of rows	x	Row spacing [cm]	Number of sowing units with seed hopper		Row fertilising possible	working width [m]	Transport width [m]
			32 l	45 l			
ED 302							
4	x	75	2 r.h. / 2 l.h.	2 r.h. / 2 l.h.	Yes	3,0	3,0
4	x	80	2 r.h. / 2 l.h.	2 r.h. / 2 l.h.	Yes	3,2	3,0
4	x	70	2 r.h. / 2 l.h.	2 r.h. / 2 l.h.	Yes	2,8	3,0
5	x	60	3 r.h. / 2 l.h.	3 r.h. / 2 l.h.	Yes	3,0	3,0
6	x	50	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	3,0	3,0
6	x	45	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	2,7	3,0
7	x	45	4 r.h. / 3 l.h.	4 r.h. / 3 l.h.	No	3,15	3,0
8	x	40	4 r.h. / 4 l.h.	—	No	3,2	3,0
10	x	30	5 r.h. / 5 l.h.	—	No	3,0	3,0
ED 452							
6	x	75	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	4,5	4,0
6	x	70	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	4,2	4,0
6	x	80	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	4,8	4,25
7	x	60	4 r.h. / 3 l.h.	4 r.h. / 3 l.h.	No	4,2	4,0
8	x	50	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	No	4,0	4,0
9	x	45	5 r.h. / 4 l.h.	5 r.h. / 4 l.h.	No	4,05	4,0
10	x	40	5 r.h. / 5 l.h.	5 r.h. / 5 l.h.	No	4,0	4,0
ED 452-K							
6	x	75	3 r.h. / 3 l.h.	—	Yes	4,5	3,0
6	x	80	3 r.h. / 3 l.h.	—	Yes	4,8	3,25
7	x	60	4 r.h. / 3 l.h.	—	No	4,2	3,2

Possible row spacings ED 02 Classic sowing units							
Number of rows	x	Row spacing [cm]	Number of sowing units with seed hopper		Row fertilising possible	working width [m]	Transport width [m]
			32 l	45 l			
ED 602							
8	x	75	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,0	6,0
8	x	80	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,4	6,0
8	x	70	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	5,6	6,0
10	x	60	5 r.h. / 5 l.h.	5 r.h. / 5 l.h.	Yes	6,0	6,0
12	x	50	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes	6,0	6,0
12	x	45	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes	5,4	6,0
ED 602-K							
8	x	75	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,0	3,05
8	x	80	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,4	3,12
9	x	60	5 r.h. / 4 l.h.	5 r.h. / 4 l.h.	No	5,4	3,05
12	x	50	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	Yes *	6,0	3,15
12	x	45	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	Yes *	5,4	3,15
12	x	50	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	No	6,0	3,05
12	x	45	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	No	5,4	3,05
ED 902-K							
12	x	70	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes *	8,4	3,05
12	x	75	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes *	9,0	3,05
12	x	80	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes *	9,6	3,05
15	x	60	8 r.h. / 7 l.h.	8 r.h. / 8 l.h.	No	9,0	3,05
18	x	45	9 r.h. / 9 l.h.	9 r.h. / 9 l.h.	Yes *	8,1	3,15**
18	x	45	9 r.h. / 9 l.h.	9 r.h. / 9 l.h.	No	8,1	3,05
18	x	50	9 r.h. / 9 l.h.	9 r.h. / 9 l.h.	Yes *	9,0	3,15**
18	x	50	9 r.h. / 9 l.h.	9 r.h. / 9 l.h.	No	9,0	3,05

* only in conjunction with front tank

** with under root fertilising

5.1.2 Contour sowing units

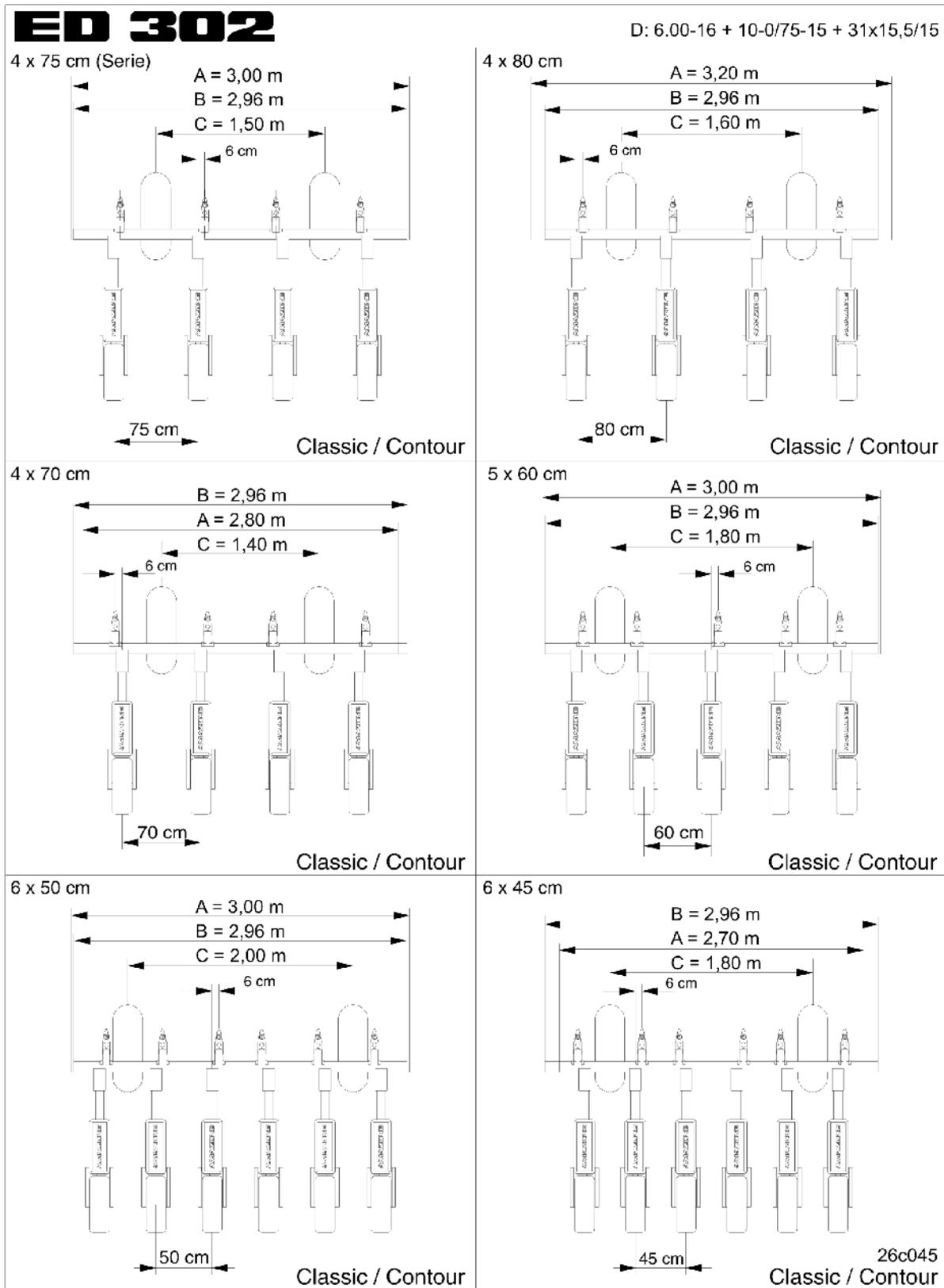
Possible row spacings ED 02 Contour sowing units							
Number of rows	x	Row spacing [cm]	Number of sowing units with seed hopper		Row fertilising possible	working width [m]	Transport width [m]
			32 l	45 l			
ED 302							
4	x	75	2 r.h. / 2 l.h.	2 r.h. / 2 l.h.	Yes	3,0	3,0
4	x	80	2 r.h. / 2 l.h.	2 r.h. / 2 l.h.	Yes	3,2	3,0
4	x	70	2 r.h. / 2 l.h.	2 r.h. / 2 l.h.	Yes	2,8	3,0
5	x	60	3 r.h. / 2 l.h.	3 r.h. / 2 l.h.	Yes	3,0	3,0
6	x	50	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	3,0	3,0
6	x	45	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	2,7	3,0
7	x	45	4 r.h. / 3 l.h.	4 r.h. / 3 l.h.	No	3,15	3,0
ED 452							
6	x	75	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	4,5	4,0
6	x	70	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	4,2	4,0
6	x	80	3 r.h. / 3 l.h.	3 r.h. / 3 l.h.	Yes	4,8	4,39
7	x	60	4 r.h. / 3 l.h.	4 r.h. / 3 l.h.	No	4,2	4,0
8	x	50	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	No	4,0	4,0
9	x	45	5 r.h. / 4 l.h.	5 r.h. / 4 l.h.	No	4,05	4,0
ED 452-K							
6	x	75	3 r.h. / 3 l.h.	—	Yes	4,5	3,05
6	x	80	3 r.h. / 3 l.h.	—	Yes	4,8	3,39
7	x	60	4 r.h. / 3 l.h.	—	No	4,2	3,39

Possible row spacings ED 02 Contour sowing units							
Number of rows	x	Row spacing [cm]	Number of sowing units with seed hopper		Row fertilising possible	working width [m]	Transport width [m]
			32 l	45 l			
ED 602							
8	x	75	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,0	6,0
8	x	80	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,4	6,0
8	x	70	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	5,6	6,0
10	x	60	5 r.h. / 5 l.h.	5 r.h. / 5 l.h.	Yes	6,0	6,0
12	x	50	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes	6,0	6,0
12	x	45	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes	5,4	6,0
ED 602-K							
8	x	75	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,0	3,05
8	x	80	4 r.h. / 4 l.h.	4 r.h. / 4 l.h.	Yes	6,4	3,12
9	x	60	5 r.h. / 4 l.h.	5 r.h. / 4 l.h.	No	5,4	3,05
12	x	50	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	Yes *	6,0	3,15
12	x	45	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	Yes *	5,4	3,15
12	x	50	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	No	6,0	3,05
12	x	45	6 r.h. / 6 l.h.	6 r.h. / 6 r.h.	No	5,4	3,05
ED 902-K							
12	x	70	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes *	8,4	3,05
12	x	75	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes *	9,0	3,05
12	x	80	6 r.h. / 6 l.h.	6 r.h. / 6 l.h.	Yes *	9,6	3,05
15	x	60	8 r.h. / 7 l.h.	8 r.h. / 8 l.h.	No	9,0	3,05
18	x	45	9 r.h. / 9 l.h.	9 r.h. / 9 l.h.	Yes *	8,1	3,15**
18	x	45	9 r.h. / 9 l.h.	9 r.h. / 9 l.h.	No	8,1	3,05
18	x	50	9 r.h. / 9 l.h.	9 r.h. / 9 l.h.	Yes *	9,0	3,15**

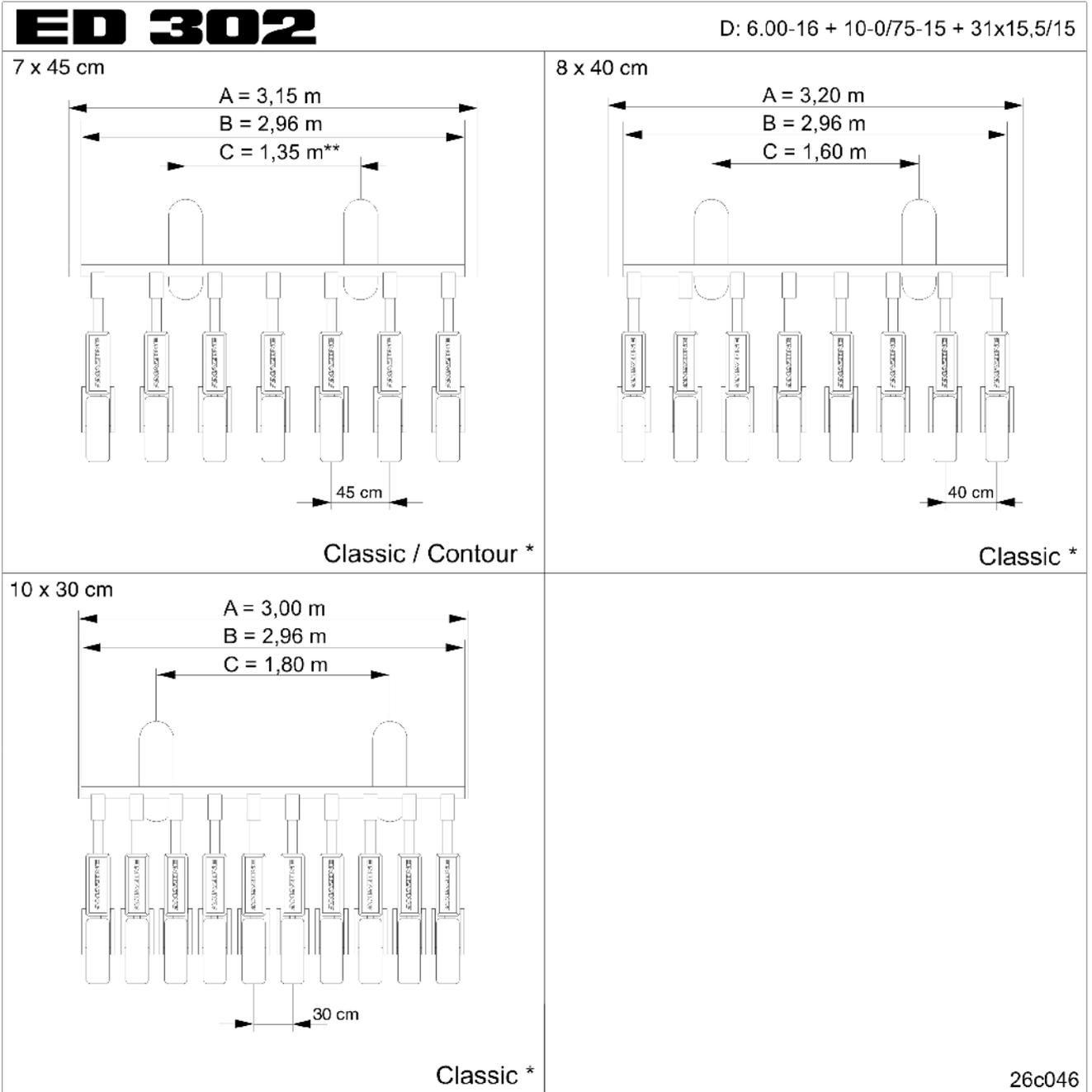
* only in conjunction with front tank

** with under root fertilising

5.1.3 Row spacings of the ED 02 Classic- and Contour sowing units - Diagram



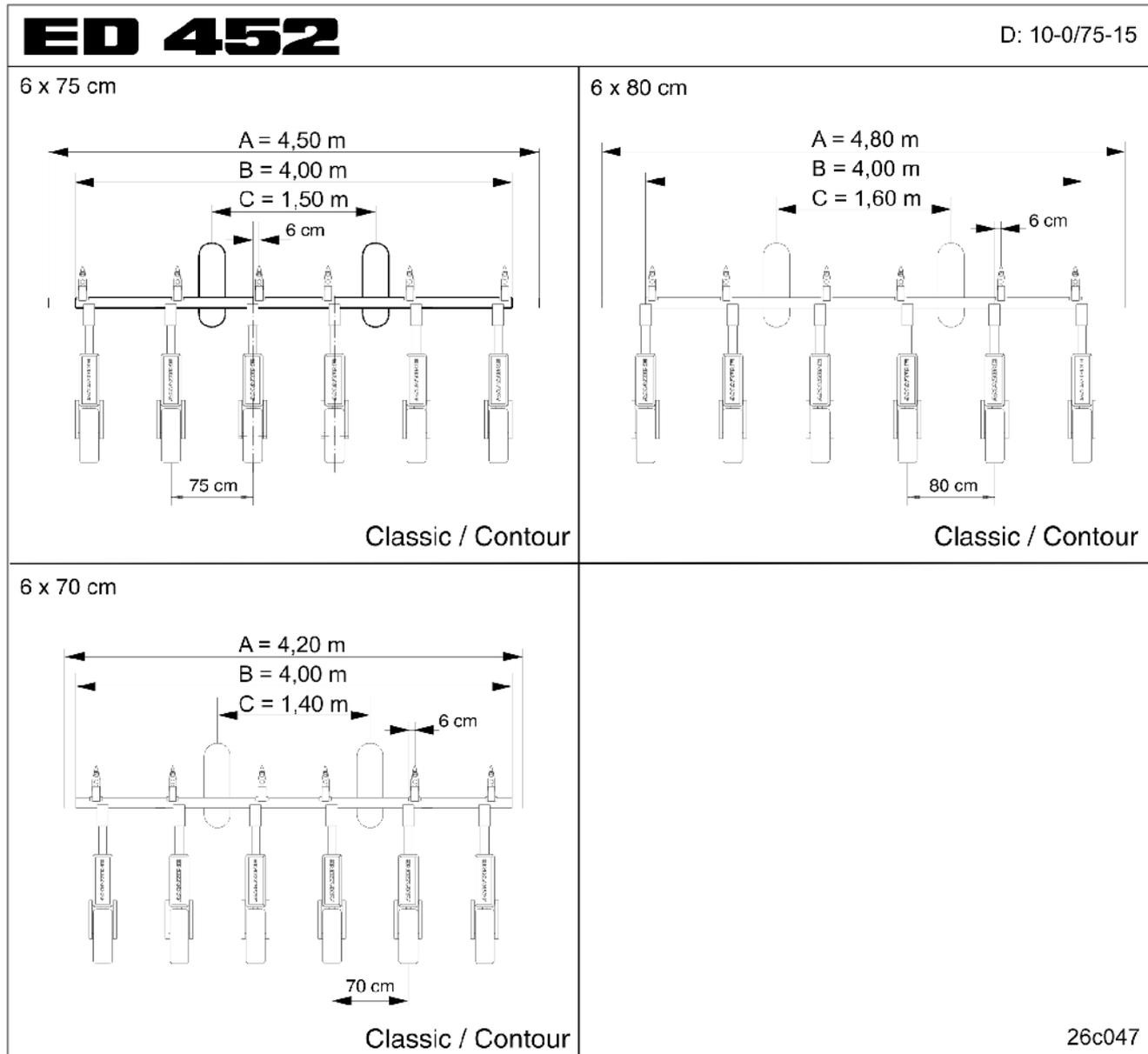
A = working width, B = frame width, C = track width, D = Tyre



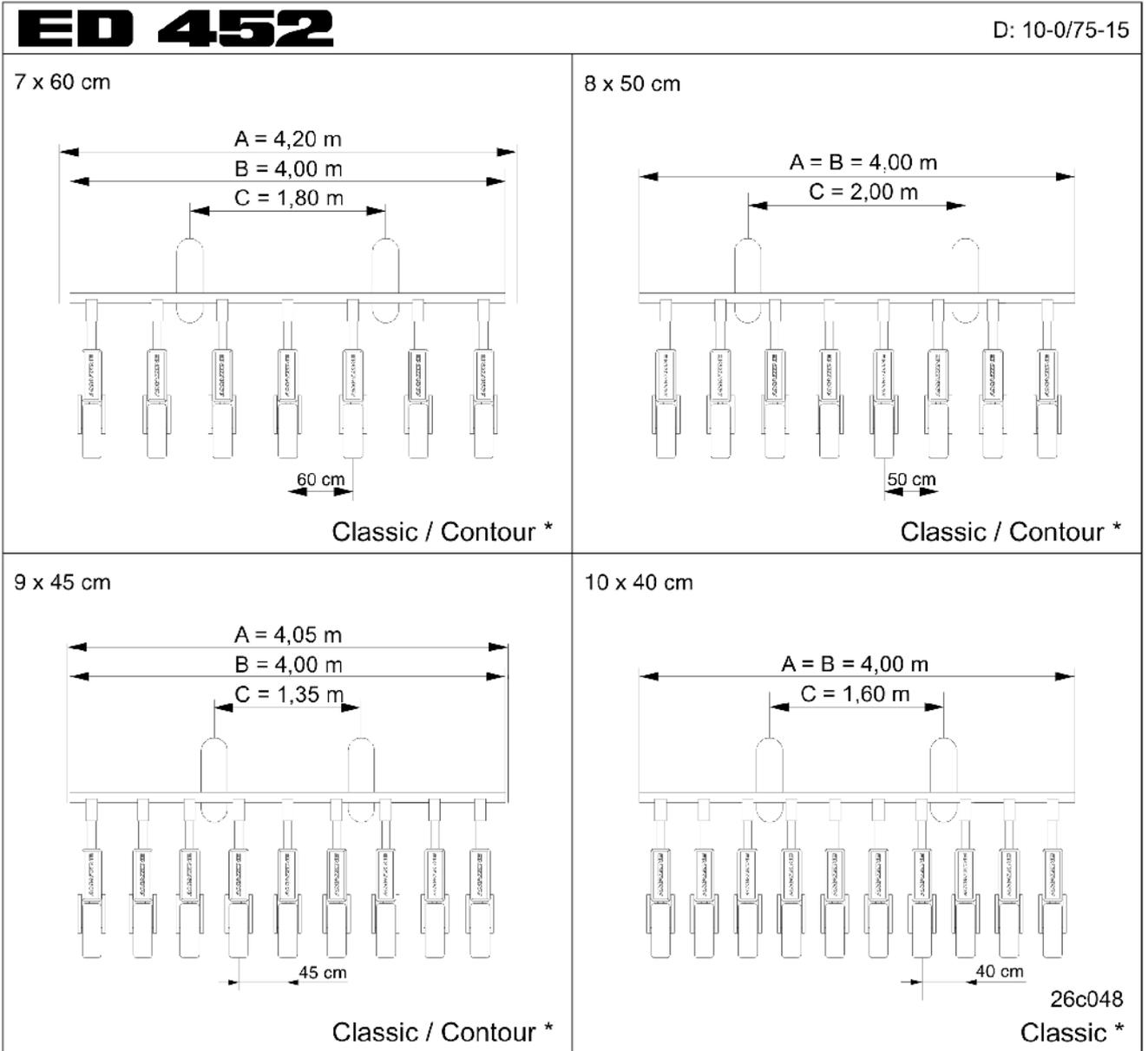
A = working width, B = frame width, C = track width, D = Tyre

* not with underfoot fertilising

** without tyres 31x15,5/15



A = working width, B = frame width, C = track width, D = Tyre



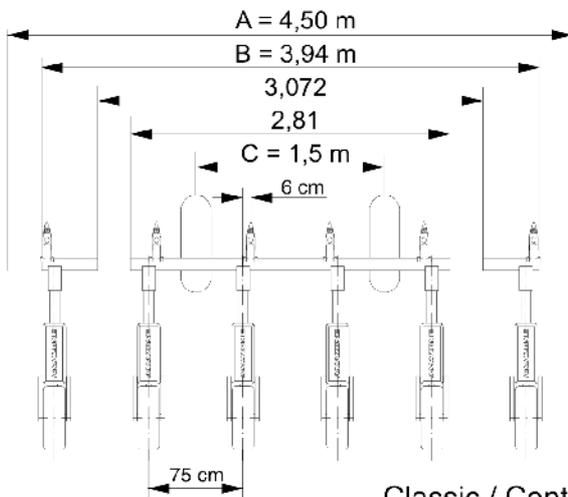
A = working width, B = frame width, C = track width, D = Tyre

* not with underfoot fertilising

ED 452-K

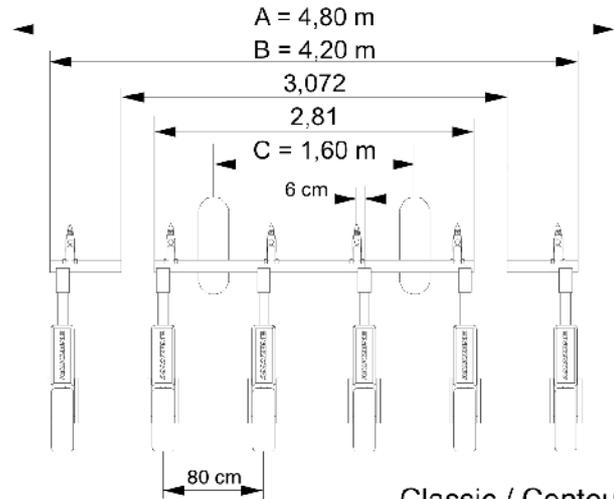
D: 10-0/75-15 + 31x15,5/15

6 x 75 cm



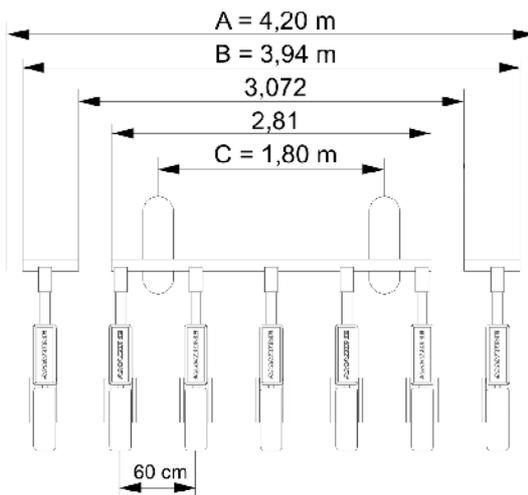
Classic / Contour

6 x 80 cm



Classic / Contour

6 x 70 cm

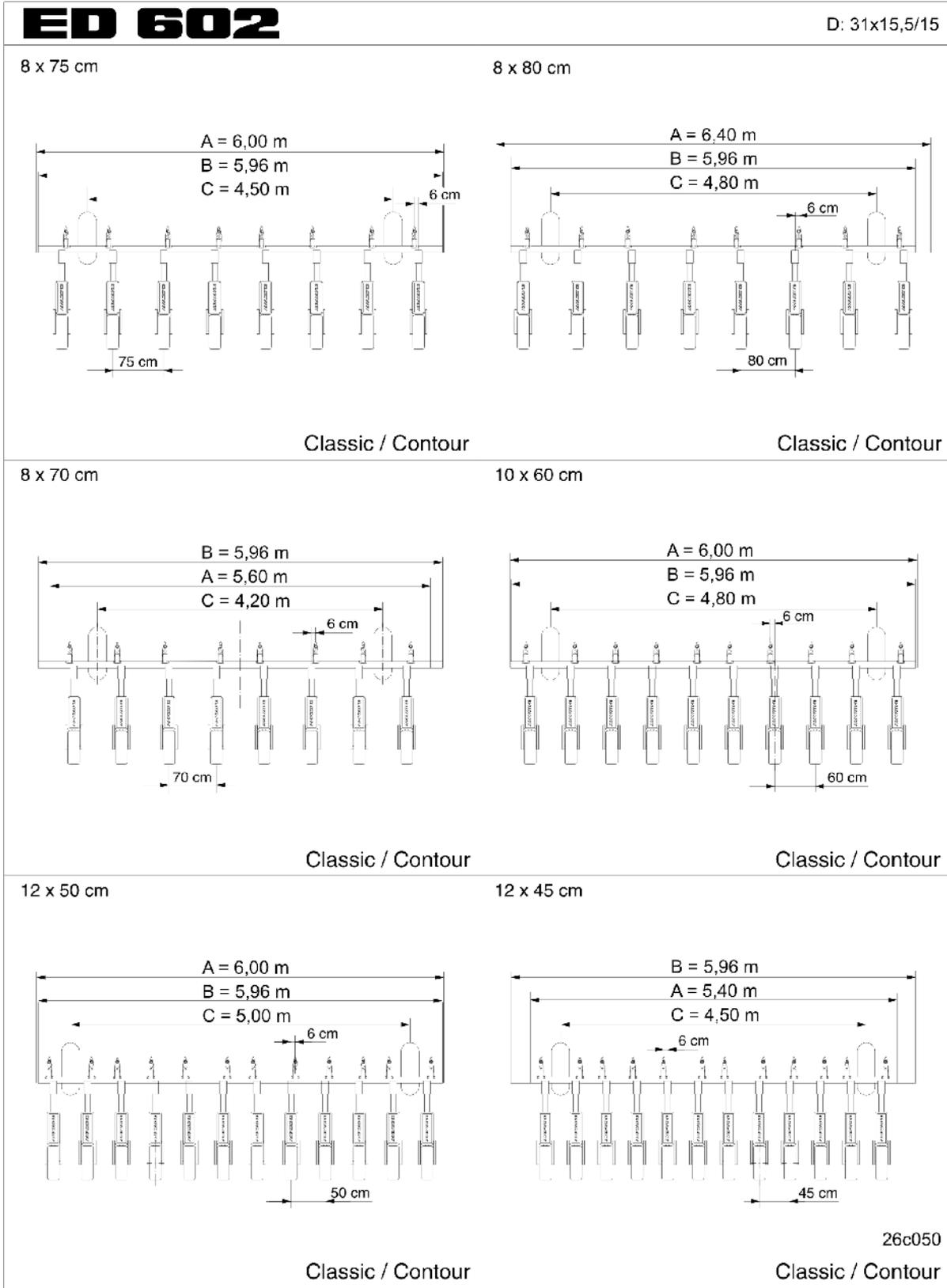


Classic / Contour *

26c049

A = working width, B = frame width, C = track width, D = Tyre

* not with underfoot fertilising

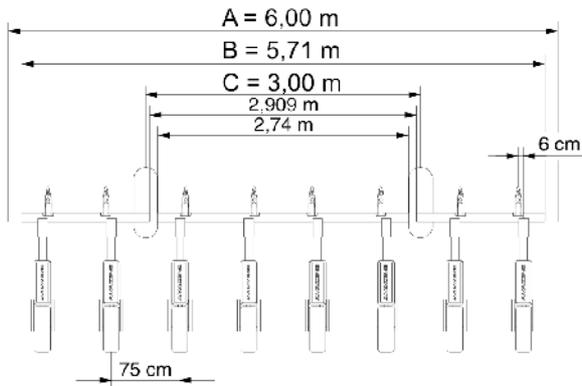


A = working width, B = frame width, C = track width, D = Tyre

ED 602-K

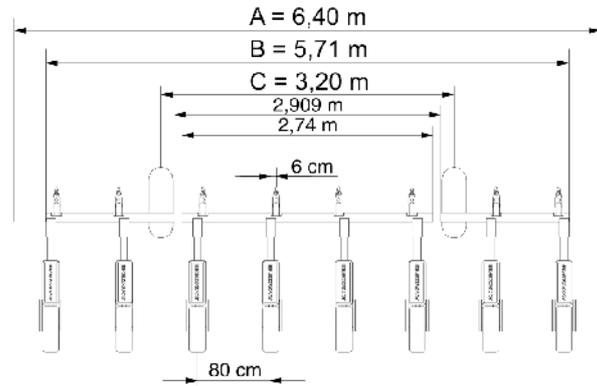
D: 31x15,5/15

8 x 75 cm



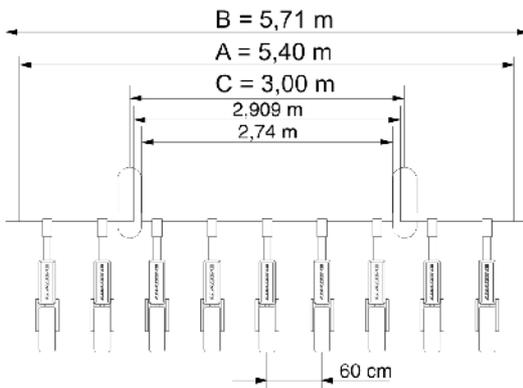
Classic / Contour

8 x 80 cm



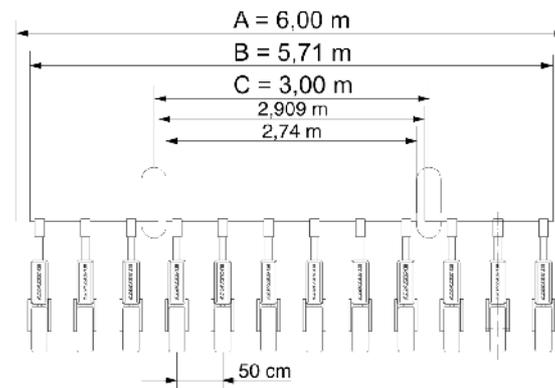
Classic / Contour

9 x 60 cm



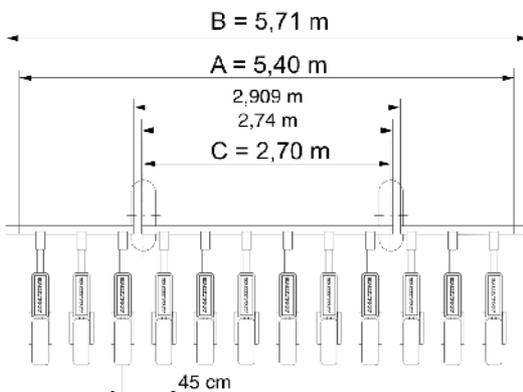
Classic / Contour *

12 x 50 cm



Classic / Contour *

12 x 45 cm

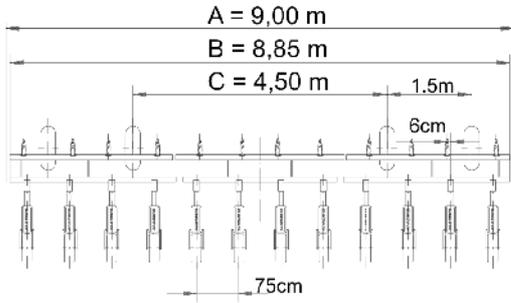


A = working width, B = frame width, C = track width, D = Tyre

* not with underfoot fertilising

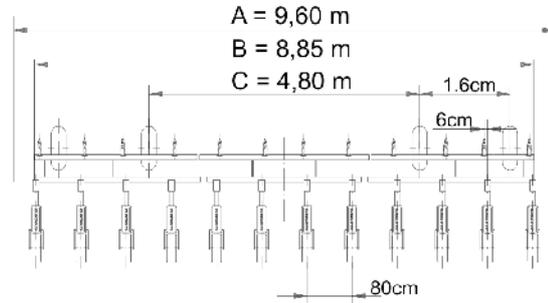
ED 902-K

12x75



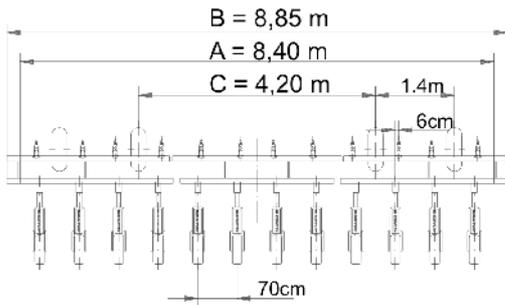
Classic / Contour

12x80



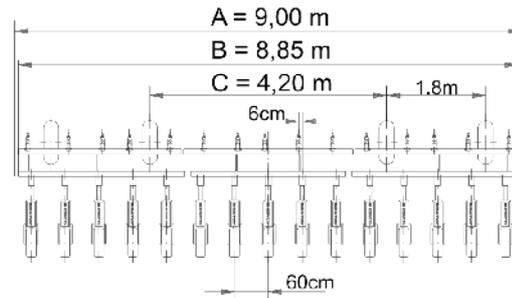
Classic / Contour

12x70



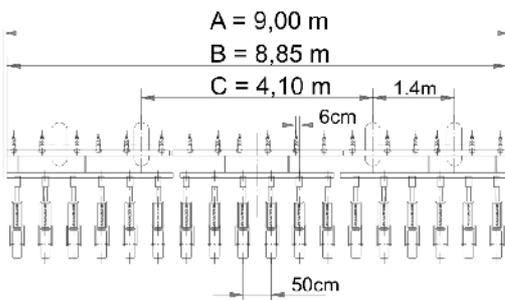
Classic / Contour

15x60



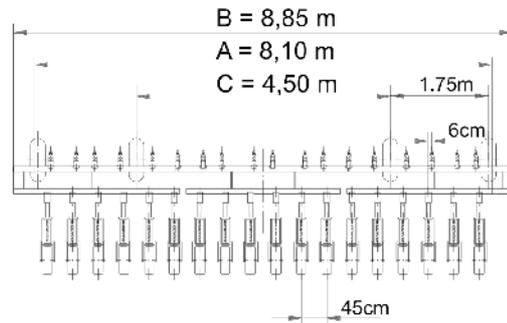
Classic / Contour

18x50



Classic / Contour

18x45



26c052
Classic / Contour

A = working width, B = frame width, C = track width, D = Tyre

5.2 Setting the singling units

For singling the various types of seed different, easily exchangeable singling discs (special option) are available.

The singling discs differ by the number and diameter of their holes.

The type of seed and the thousand grain weight determine the choice of the required singling disc as well as the necessary scraper- and reduction flap position. Details please take from table (Fig. 64).

Type of seed	Thousand grain weight	Singling disc	Product No.	Position	
				Scraper	Reduction flap
Maize	smaller than 220 g (11 kg / 50000 k)	green 30/5	91077	1	2
	220 to 250 g (11 to 12,5 kg / 50000 K)			2	2
	250 to 280 g (12,5 to 14 kg / 50000 K)			3	2
	280 to 320 g (14 to 16,0 kg / 50000 K)			4	1
	larger than 320 g	natural 30/5,8	910790	1	1
natural 30/5,8		3		1	
Beans	smaller than 400 g	dark grey 60/5	924211	5	2
Haricot beans	larger than 400 g	red 45/6	910792	5	1
		black 60/2,5	924213	2	1
Sunflower		brown 30/2,5 (for grain spacings > 22cm)	910794	1	2
		pink 15/2,5 (for grain spacings > 22cm)	917232		
Soy beans		orange 60/4	924212	3	2
Cotton		light green 60/3,2	915673	3	2
Peas		dark grey 60/5	924211	3	2
Sorghum**		burgundy 60/2,2	918477	1	2
Sugar beet, prilled**		blue 30/2,2	918860	3	3
		turquoise 15/2,2	920048		
Water melon, not prilled sugar beet**		yellow 30/1,8	920049	1	2
Bracharia**		fawn coloured 60/1,4	920050	1	2
Rape**		white 90/1,2	920051	3	3
* factory set to position 2					
** exchange standard ejector for the supplied one					

Fig. 64

Example

Seed: **Maize type Felix**
 Thousand grain weight: **210 g**
 Taken from table (Fig. 64):
 Singling disc:..... **green with 30 holes**
 Scraper position:..... **1**
 Reduction flap position: **2**



The given values in the table are only mean values which may change due to the individual grain shape.

5.2.1 Changing the singling disc

For changing the singling discs lift the sowing unit or raise the complete Airplanter.



When lifting the complete implement secure against unintended lowering.

- Slacken the rear bolt (Fig. 65/1) of the coultter bracket and swivel the coultter (Fig. 65/2) downwards.
- Slacken plastic counter nut (Fig. 65/3) and remove the suction cover (Fig. 65/4) with the singling disc (Fig. 66/2) in sideways direction
- Exchange singling disc.

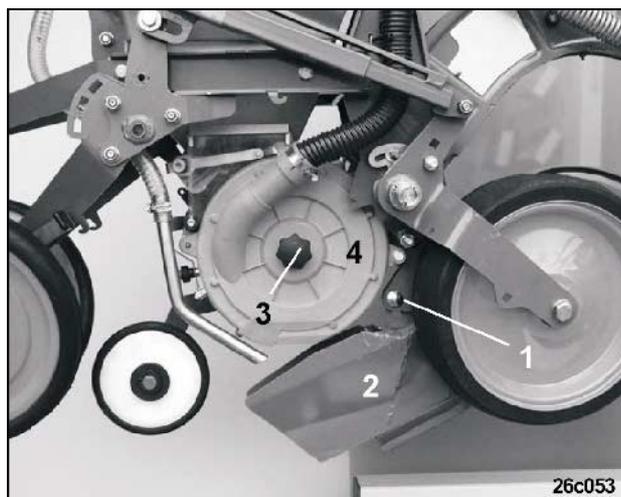


Fig. 65



On singling discs with very small holes (e.g. singling disc for sorghum burgundy 60/2,2) exchange the ejector (Fig. 66/3) for the supplied yellow ejector with its smaller ejector ball.

The naps (Fig. 66/4) must face towards the housing (Fig. 66/5) and not towards the suction cover (Fig. 66/1).

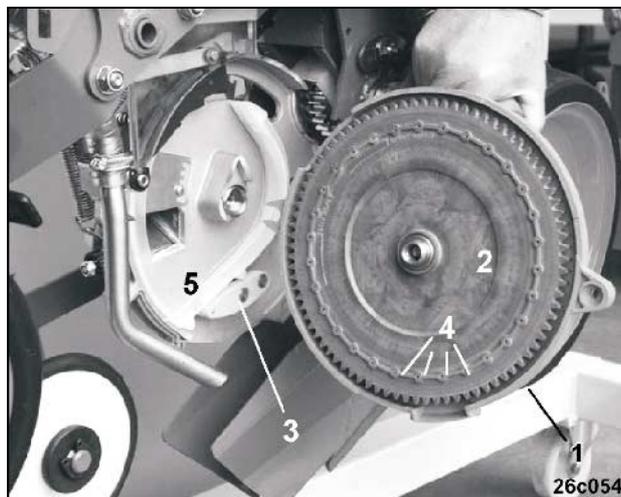


Fig. 66

- Mount the singling disc together with the suction cover and bolt on the cover.
- Check the scraper (Fig. 67/1) for proper movement. To do this, repeatedly slightly swivel the scraper (Fig. 67/1) with the aid of the lever (Fig. 67/2) - where the spring is hooked in, and guide the scraper out of its position.



The spring must pull the scraper back into its earlier position.

- Depending on the type of seed readjust the scrapers if necessary.
- Swing the coulter upwards and affix.

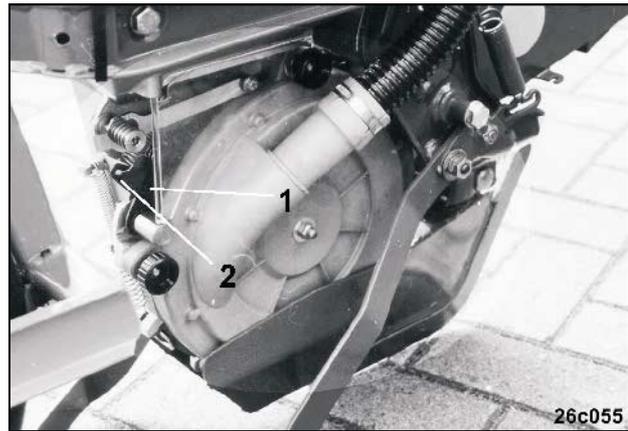


Fig. 67

5.2.2 Setting the scraper position

The scrapers (Fig. 68/1) are designed as a three staggered toothed plastic part which can be set to 5 positions towards the nap holes of the singling disc.

The position to be set in the main depends on the thousand grain weight of the seed to be sown and can be taken from the table (Fig. 64).

For setting the indicated scraper position hook the setting lever (Fig. 68/2) into the setting bolt (Fig. 68/3).

In Figure (Fig. 68) the scraper position "2" is illustrated.



If the distance between scraper and nap holes of the singling disc is too big, double coverings may occur.

If the scraper covers the nap holes of the singling disc too much, gaps may be the result.

Regarding the seed singling check the scraper position set for double coverage and/or gaps in the field.

Checking either by a person following the implement, who observes the function of the singling units by the wight windows (Fig. 68/4) or a distance is uncovered in the field in order to check the grain spacing.

If double coverage or gaps are noticed, readjust the scraper position as necessary.

If the seed can be seen through the sight window (Fig. 68/4) more seed is delivered to the seed housing than discharged.

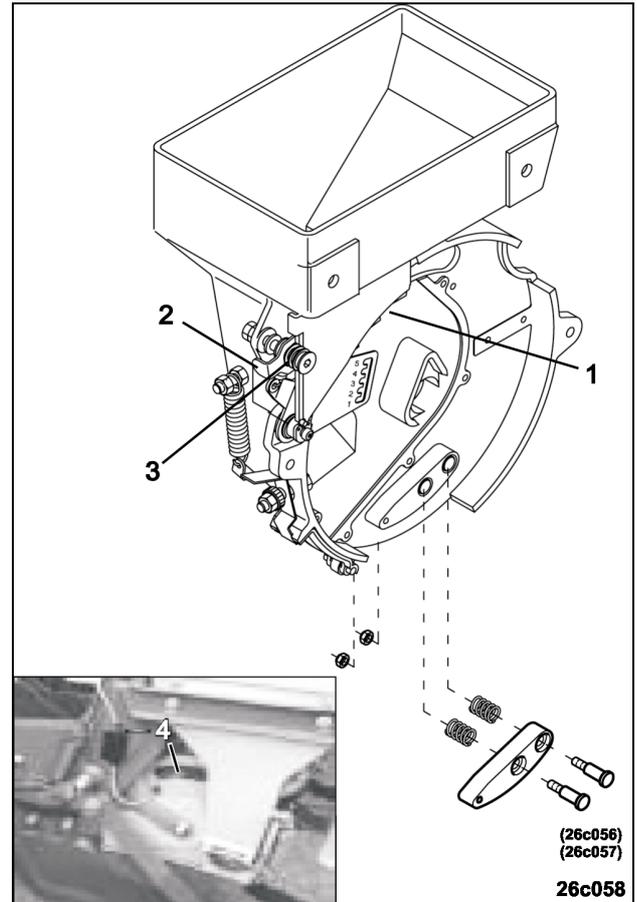


Fig. 68

5.3 Setting the reduction flap position

The position of the reduction flap (Fig. 69/1) determines the cross section of the seed inlet opening (Fig. 69/2) from the seed hopper to the seed housing. Take the correct reduction flap position from table (Fig. 70). By the factory the reduction flap has been set to position "2".

	Reduction flap position		
	1	2	3
Seed	beans	for all common seeds, e.g. maize, sunflower, soya beans, cotton, peas, sorghum, bracharia and water melons	beet

Fig. 70



The reduction flap positions 1 – 5 can be set. The embossings (Fig. 69/3) indicate the individual reduction flap positions.

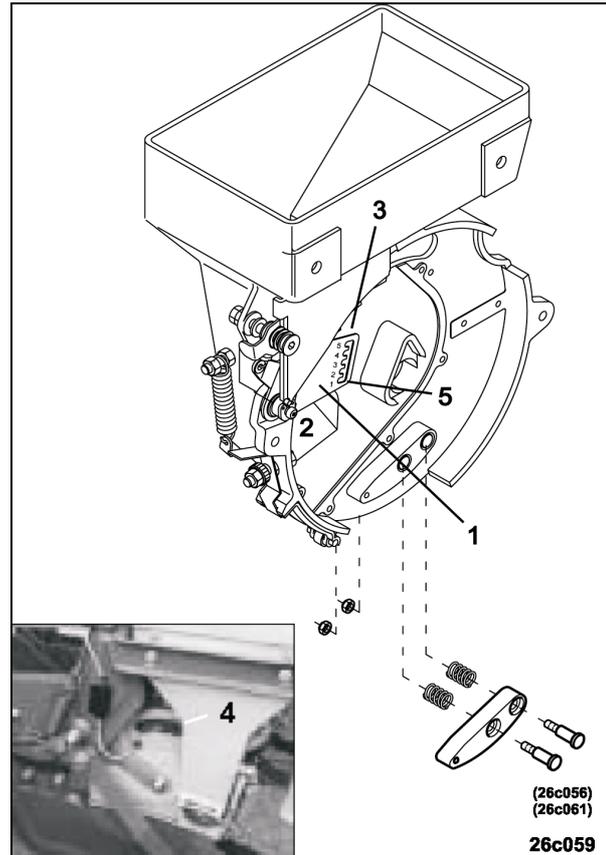


Fig. 69

If the seed is nevertheless visible in the sight window (Fig. 69/4) the seed housing is filled in a not permissible way. This results in an overflow of the seed housing and thus in an inaccurate seed application.

Possible reasons:

- seeds with an especially good flow property (very smooth and even surface),
- operating the ED in combination with a reciprocating power harrow.

In this case, reduce the seed delivery to the seed housing with the aid of the reduction flap (Fig. 69/1) as follows:

- Remove suction cover and singling disc
- Slacken bolts (Fig. 69/5)
- Reduce the seed delivery with the aid of the reduction flap.
- Tighten the bolts for locking the reduction flap.
- Install the singling disc and the suction cover in the appropriate way.



If in spite of the very large seed inlet opening the seed does not flow properly, readjust the reduction flap (Fig. 69/1) upwards until only the contour of the aluminium housing limits the seed flow.

5.4 Exchange the ejectors

For exchanging slacken the nuts (Fig. 71/1).



Bolts (Fig. 71/2) are provided with a hex. socket.

Remove the scraper (Fig. 71/3) with bolts and springs (Fig. 71/4).

Exchange the scraper and re-install properly in reverse order.

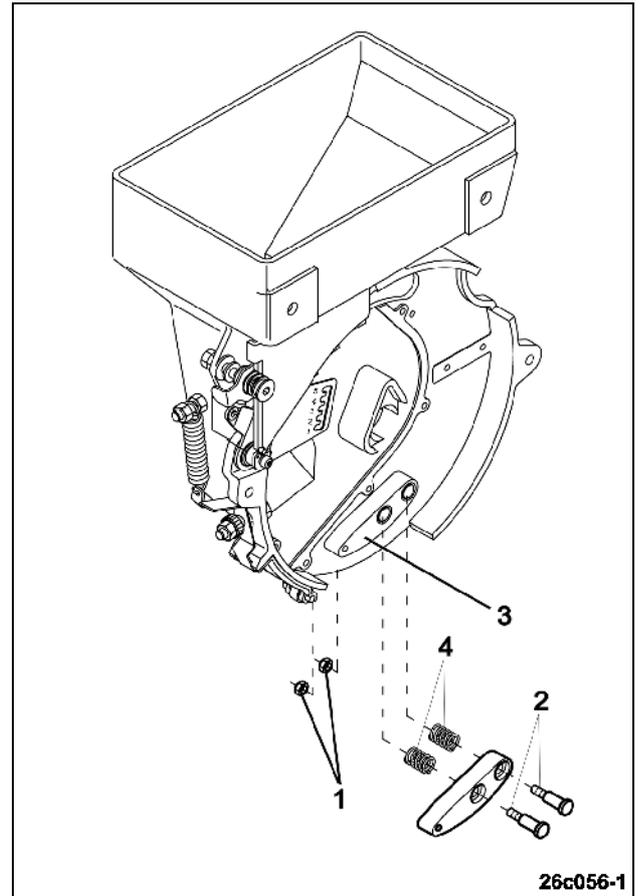


Fig. 71

5.5 Setting the sowing unit Classic

5.5.1 Setting the placement depth

On the **Classic-sowing unit** the placement depth is infinitely variable from 0 up to 8 cm and on the bean sowing coulters (special option) from 0 up to 12 cm.

The figures (0 to 110) on the scale (Fig. 72/1) represent the relevant placement depth. The placement depth setting is read off the reading edge (Fig. 72/2).

The placement depth is set with the aid of the pressure roller(s) (Fig. 72/3) as follows:

- Slacken the fixing bolt (Fig. 72/4)
- Turn the placement depth setting spindle (Fig. 72/5) and set the desired placement depth
- Retighten fixing bolt (Fig. 72/4).



Set the placement depth in the field and recheck.

Prior to this check with the implement lowered into operational position whether the seed hopper covers of the sowing units are in horizontal position when the sowing coulters penetrate the soil.

Only then the sowing coulters will be properly guided in the soil and a faultless, even seed placement depth is achieved.

Correct deviations by changing the upper link arms' length.

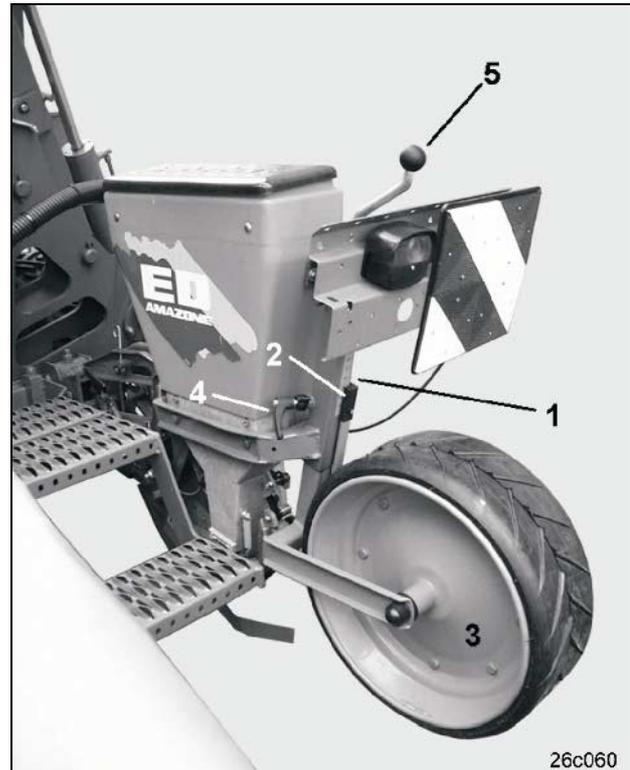


Fig. 72

5.5.2 Checking the placement depth and the placement spacing

Check the set placement depth of the seed as the pressure roller penetrate the soil differently, depending on the kind of soil.

Operate with your machine approx. 10 m in the intended operational speed and deposit seed grains. By carefully uncovering the seed grains placed into the soil check the placement depth and the placement spacing.



If varying soils prevail, always recheck the placement depth of the seed .

The multi-placement tester (special option) The multi-placement tester (special option).

With the aid of the pointer (Fig. 74/1) the placement depth can be read off the scale (Fig. 74/2).



Fig. 73

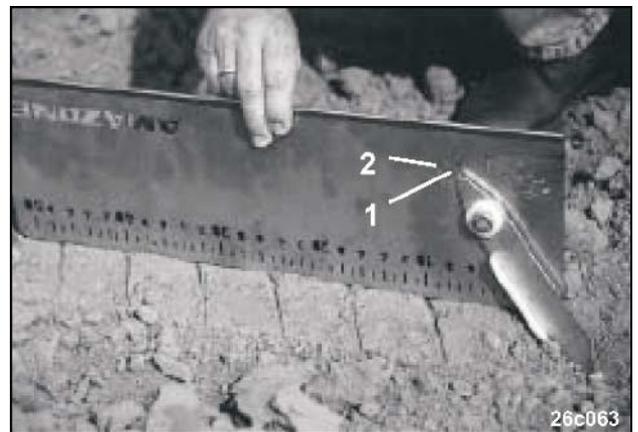


Fig. 74

The placement spacing of the grains in the soil can be read off the scale (Fig. 75/1).



Fig. 75

5.5.3 Changing, uneven depth placement due to a very coarse seed bed

In case of a very cloddy seed bed no even seed placement depth will be achieved. For this the use of a clod clearer (Fig. 76/1) is sensible.

The clod clearer can be set in its height by inserting the pin (Fig. 76/2) into the various holes (Fig. 76/3).



Set the height of the clod clearer in such a way that only the coarse clods are cleared to the sides.

An entire soil movement by the clod clearer will result in disadvantages when closing the seed furrow.

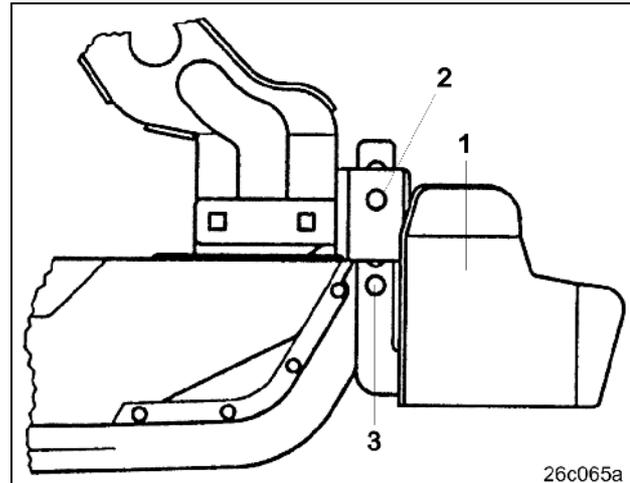


Fig. 76

5.5.4 Increasing and reducing the pressure on the Classic sowing unit (spring pressure adjustment)

The spring pressure adjustment for the sowing units provides an additional increasing or reducing of the pressure on the sowing units. This is especially recommended for mulch sowing, heavy soils or a large placement depth.

Adjust the spring pressure if the own weight of the sowing unit is not sufficient to place the seed in the desired placement depth into the soil.

Measures if the placement depth of the seed is not achieved with the Classic sowing unit: folgende Einstellungen vorzunehmen

Grains are not placed deep enough	Readjust the placement depth with the aid of the placement depth setting crank
If this measure is not sufficient	Apply pressure to the sowing unit.
Grains are placed too deeply	Readjust the placement depth with the aid of the placement depth setting crank

5.5.4.1 Increase pressure on the sowing unit

Hook the tensioning spring (Fig. 77/2) into the upper eye (Fig. 77/3).

Swivel the ratchet lever (Fig. 77/1) for applying additional pressure onto the sowing unit into positions III or IV and lock.



Hold the ratchet lever (Fig. 77/1) tight as the entire spring force is applied to the lever.



If the lever is in the positions I or II (neutral position) only the own weight of the sowing unit is applied to the sowing coulter.

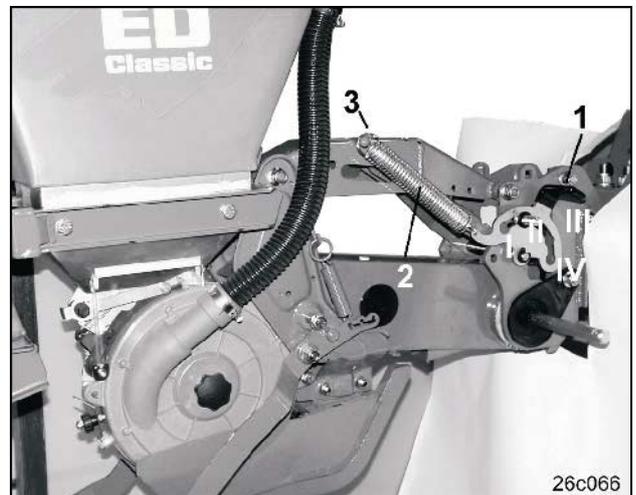


Fig. 77

5.5.5 Setting the closer for closing the seed furrow

The furrow closers (Fig. 78/1) should shallowly work in the soil and cover the seed furrow with loose soil.

The flexi rubber tyre presses the soil.

The pressure intensity of the furrow closers can be set in 3 steps.

For changing the pressure intensity change the tensioning point (Fig. 78/2) of the spring (Fig. 78/3) on the furrow closer (in the illustrated position the lowest pressure intensity has been set).

For further increasing the pressure intensity hang the spring eye (Fig. 78/4) instead of the ring (Fig. 78/5) into the hook (Fig. 78/6).



Fig. 78

5.6 Setting the sowing unit Contour

5.6.1 Setting the placement depth on the sowing unit Contour

On the Contour sowing unit the placement depth is infinitely variable from 0 up to 12 cm.

The figures (0 to 100) on the scale (Fig. 79/1) represent the relevant placement depth. The placement depth setting is read off the reading edge (Fig. 79/2).

The placement depth is set via the pre-running pressure roller (Fig. 79/6) and the two following V-pressure rollers (as option 370 flexi roller) (Fig. 79/3). The placement depth is set via the setting spindle (Fig. 79/5) as follows:

- Swivel upwards the spring buckle (Fig. 79/4) to prevent the seed placement depth setting spindle from unintended turning.
- Turn the seed placement depth setting spindle (Fig. 79/5) and set the desired seed placement depth.
- Lower spring buckle (Fig. 79/4) to secure the seed placement setting.
- Recheck the seed placement depth. Refer to para.: 5.5.2.

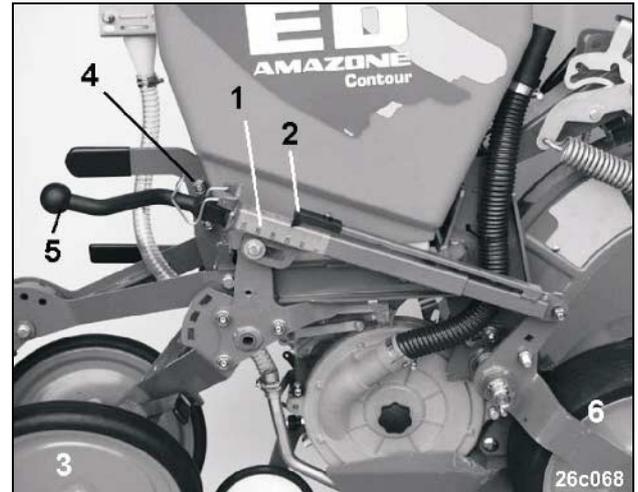


Fig. 79



Set the placement depth in the field and check.

Prior to this check with the implement lowered into operational position whether the seed hopper covers of the sowing units are in horizontal position when the sowing coulters penetrate the soil.

Only then the sowing coulters will be properly guided in the soil and a faultless, even seed placement depth is achieved.

Correct deviations by changing the upper link arms' length.

5.6.2 Changing, uneven depth placement due to a very coarse seed bed

In case of a very cloddy seed bed no even seed placement depth will be achieved. For this the use of a clod clearer is sensible.

The clod clearer (Fig. 80/1) can be set in its height by inserting the pin (Fig. 80/2) into the various holes (Fig. 80/3).



Set the height of the clod clearer in such a way that only the coarse clods are cleared to the sides.

An entire soil movement by the clod clearer will result in disadvantages when closing the seed furrow.

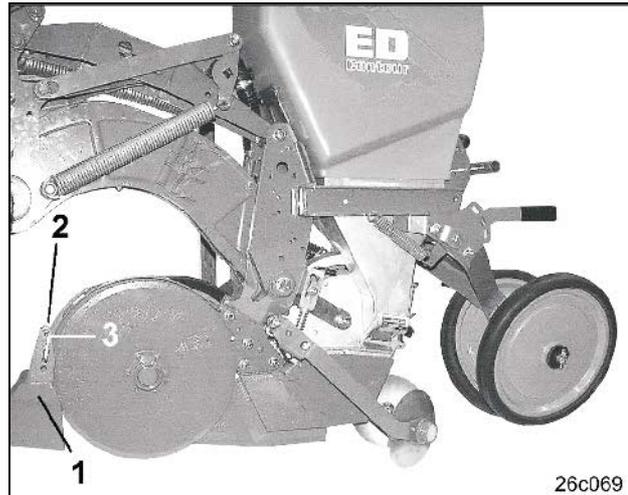


Fig. 80

5.6.3 Contour sowing unit (spring pressure adjustment)

The spring pressure adjustment for the sowing units provides an additional increasing or reducing of the pressure on the sowing units. This is especially recommended for mulch sowing, heavy soils or a large placement depth.

Adjust the spring pressure when the own weight of the sowing unit is not sufficient to place the seed in the desired placement depth or when the own weight of the sowing unit is too big and the sowing coulter penetrates the soil too deeply.

If the desired seed placement depth is not achieved with the Contour sowing unit, take the following measures:

Grains are not placed deep enough	Readjust the placement depth with the aid of the placement depth setting crank.
If this measure is not sufficient	Apply pressure to the sowing unit
If this measure is not sufficient	Change the pressure roller load distribution to "front 30 %" and "rear 70 %".
Grains are placed too deeply	Readjust the placement depth with the aid of the placement depth setting crank.
If this measure is not sufficient:	Relief sowing unit from pressure

5.6.3.1 Increase pressure on the sowing unit

The pressure application on the sowing unit can be changed in three steps.

Slightly lift the implement for setting.

Besides the unloaded state (load only by own weight of the sowing unit) (Fig. 81) two additional steps of pressure application (step 1 and step 2) are available.

For setting the pressure steps approach the sowing unit from the rear, press the calibration crank (Fig. 81/1) downwards and release the locking crank (Fig. 81/2) so that the springs are free from pressure.

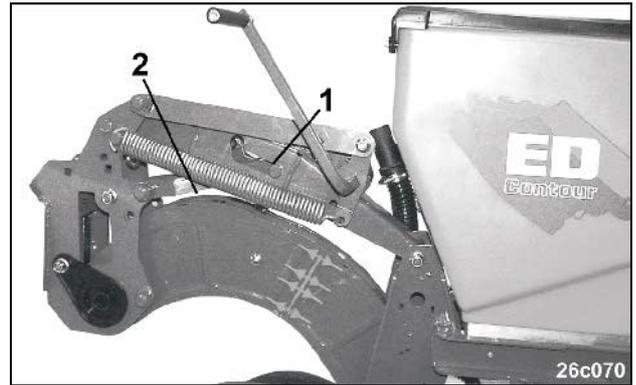


Fig. 81

Setting the medium pressure (step 1)

Set both springs to the position according to (Fig. 82/1). By actuating the calibration crank lock the locking lever on the upper pin (Fig. 82/2).

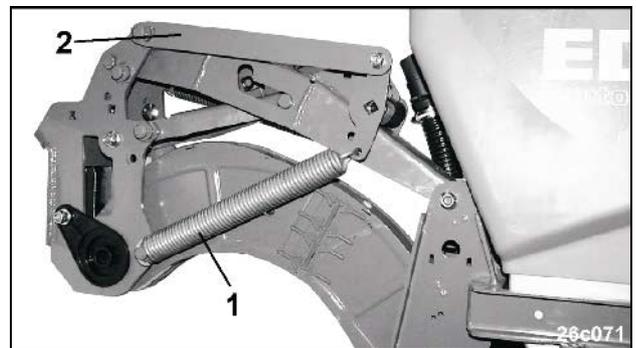


Fig. 82

Setting the heavy pressure (step 2)

set both springs into the position according to (Fig. 83/1). By actuating the calibration crank lock the locking lever on the lower pin (Fig. 83/2).

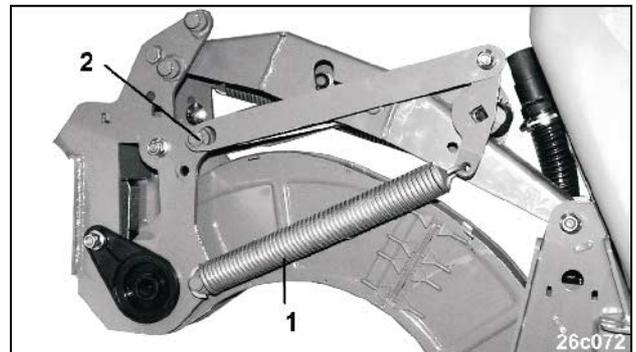


Fig. 83

5.6.3.2 Changing the pressure roller load distribution

For matching the various soil conditions the load distribution between the pre-running (Fig. 84/1) and the following pressure roller (Fig. 84/2) can be adjusted.

In the factory an even load distribution (50/50) between these pressure roller has been set.

For changing the load distribution, the depth placement setting spindle (Fig. 84/3) can be fixed in the different holes I, II, III and IV in the rocker arm (Fig. 84/4) and the quadrant plate (Fig. 84/5).

The rocker arm (Fig. 84/4) is provided with the holes I and II, the quadrant plate (Fig. 84/5) is provided with the holes III and IV.

Standard-setting for normal sowing conditions

Setting front 50% and rear 50%
holes I and III

Setting for very heavy soils, especially in order to apply more pressure to the rubber V-pressure rollers

Setting front 30% and rear 70%
holes II and III.

Setting for pressure sensitive seeds (e.g. beet), (for reducing the pressure applied to the follow- ing pressure rollers).

Setting front 70% and rear 30%
holes I and IV.

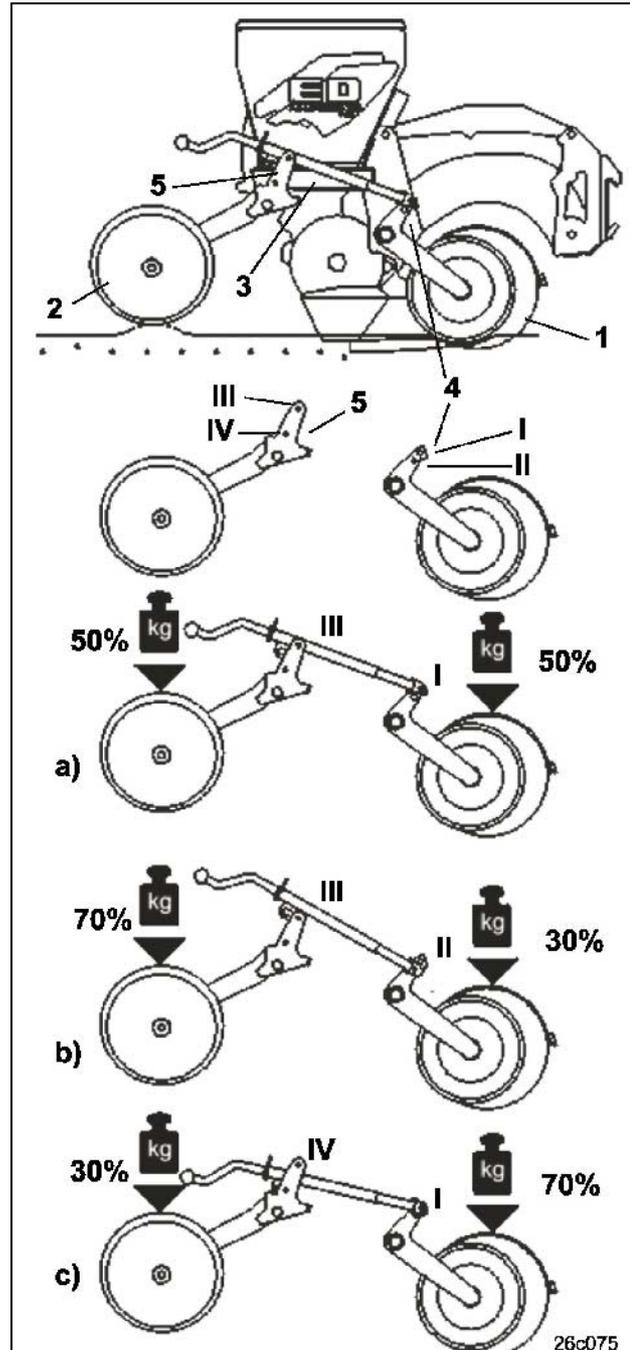


Fig. 84

5.6.4 Setting the closer for covering the seed furrow

The pressure force of the furrow closers (Fig. 85/1) can be set in three steps.

. For changing the pressure intensity let the spring (Fig. 85/2) . For changing the pressure intensity let the spring.

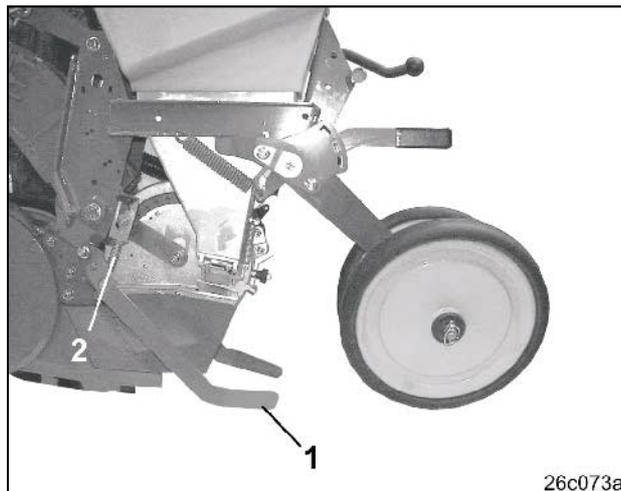


Fig. 85

5.6.5 Setting the rubber V-pressure rollers

Besides setting the depth placement the two rubber V-pressure rollers also provide the closing of the seed furrow created by the sowing coulter.

the axial distance between the two rubber V-pressure rollers can be changed after having removed the clip pin (Fig. 86/1).



Set the spacing between the rubber V-pressure roller in such a way that the rubber V-pressure rollers run closely at the side of the seed furrow cutting edge. This way, the seed furrow cutting edges are broken up and close the seed furrow.

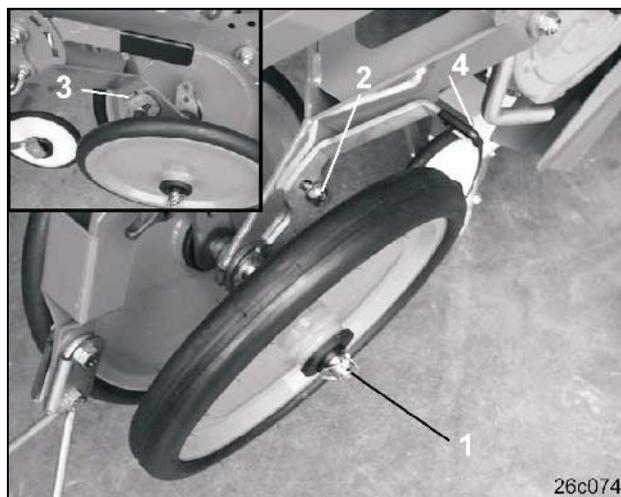


Fig. 86

If the seed furrow is not closed properly though the axial rubber V-pressure roller distance has been set correctly, loosen the bolted connection (Fig. 86/2) and infinitely variably change the actuation of the two rubber V-pressure roller which are arranged in an inclined position towards each other. The profiled pointer element (Fig. 86/3) acts as a setting aid.

Way of function

Setting lever (Fig. 84/4) facing downwards:

- pressure rollers run parallel.

Setting lever (Fig. 86/4) facing upwards:

- increased soil movement into the seed furrow.



If the earlier described setting possibilities of the rubber V pressure rollers do not result in the desired success, apply more pressure to the rubber V pressure rollers.

5.6.6 Additional possibilities to increase the pressure of the rubber V pressure roller on the Contour sowing unit

Apply more pressure to the rear pressure rollers with the aid of the spring (Fig. 87/1)

Lock the setting lever (Fig. 87/2) of the spring (Fig. 87/1) in an upper position.

Three different steps of pressure intensity can be set. The highest pressure is achieved in the upper most position (Fig. 87/3).



This setting is mostly used at varying operational conditions.

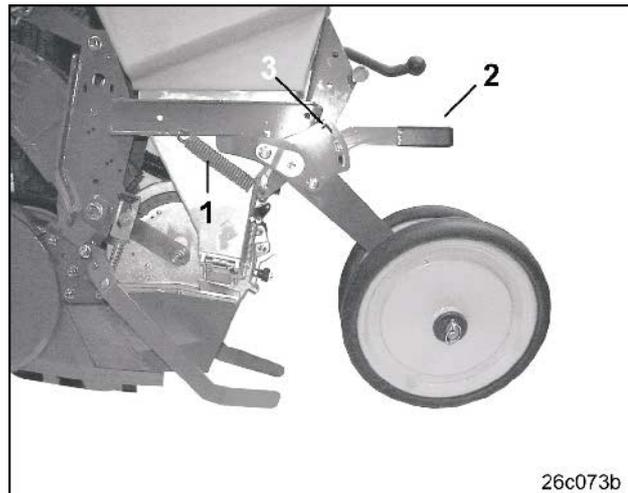


Fig. 87

Change the pressure roller pressure distribution to "front 30 % and rear 70 % and this way apply more pressure to the rear pressure rollers (Fig. 88/1)

Fix the placement depth setting spindle (Fig. 88/2) in different holes II and III in the front rocker arm (Fig. 88/3) and the rear rocker arm (Fig. 88/4).

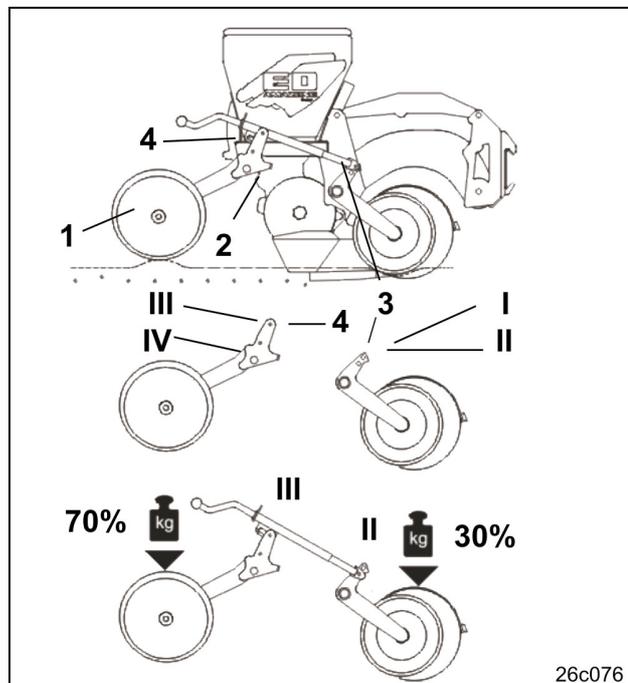
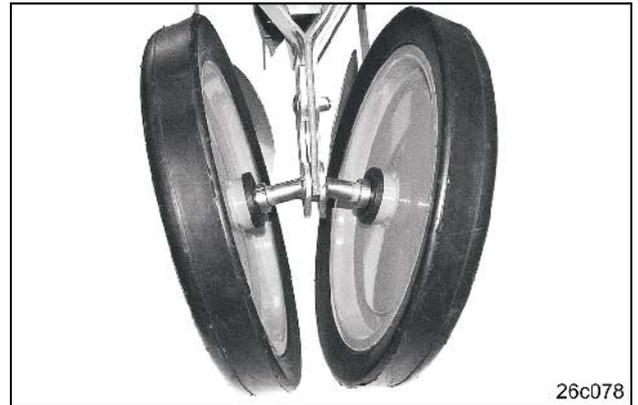


Fig. 88

5.6.7 Rubber V-rollers

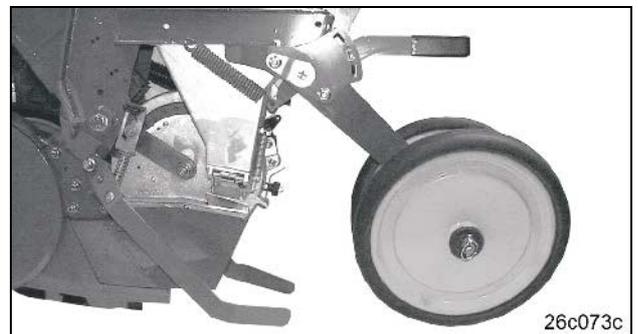
The rubber coating of the rubber V-rollers has an integrated steel ring on the inner side which provides an additional reinforcement of the rubber and helps to increase the pressure.



26c078

Fig. 89

Rubber-V-pressure rollers with pre running furrow closers (Fig. 90).



26c073c

Fig. 90

Rubber V-rollers with disc furrow closers (Fig. 91).



26c080

Fig. 91

Rubber V-rollers with following furrow closers (Fig. 92).

The pressure of the following furrow closers (Fig. 92/1) can be set in three steps with the aid of the spring (Fig. 92/2). The pressure can be increased by hooking the spring into the different gaps (Fig. 92/3).

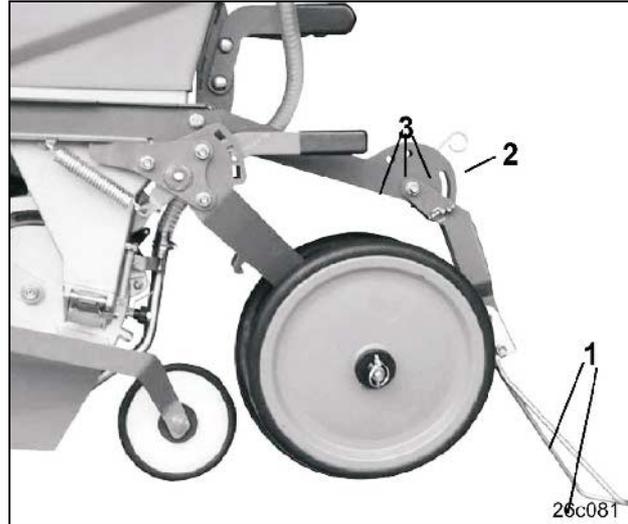


Fig. 92

Rubber V-roller with intermediate pressure roller (Fig. 93).



Fig. 93

5.7 Track marker

The Airplanters ED are equipped with scalloped marker discs for tracing a mark in the tractor's wheel track or in the tractor's centre. Before starting operation lower the marker arms into working position. When turning at the headlands both marker discs and implement are lifted out of the soil.

If the marker arm hits an obstacle during operation the shear bolt will shear off and protects the marker arms from damage.



When replacing the shear bolts only use bolts with the stability 8.8.



Fig. 94

Airplanters ED with large working widths are equipped with hydraulically actuated track markers with vertical folding which is as well available as a special option for all other implements.

The lifting speed of the track markers can be adjusted with the air of a throttle valve.

The vertical track marker folding serves for

- bringing the track marker into the vertical position and
- switching over the track marker on the headlands.

Positioning the marker arms into the vertical position reduces the implement width within a short time. This way the tractor driver can quickly negotiate obstacles.

If the marker arm hits firm obstacles during operation the shear bolt will shear off and protects the marker arms from damage.



Before travelling on public roads lock the markers in transport position.

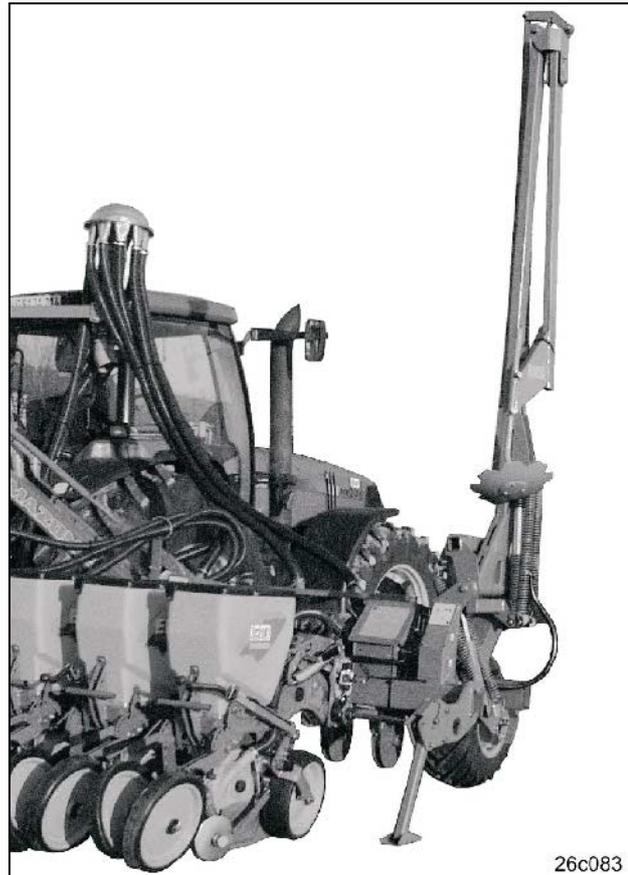
Danger of injury in folding area of the marker arms between markers and implement frame. Never reach into the squeezing area as long as parts are still moving.

It is prohibited to stay beneath a lifted, not secured track marker arm.

During operation the marker arm of the ED 902 K will reach a height of 3.65 m.

With lifted machine a height of 4 m may be exceeded.

During folding procedure the height will clearly exceed 4 m.



26c083

Fig. 95

5.7.1 Setting the markers to the correct length

Depending on the tractor's wheel marks, the working width, the row spacing and the number of rows of your Airplanter different marker trace measurements result, i.e. the distances from the soil contact surface of the marker disc towards the implements' centre.

For setting the marker arm length fold down both marker arms.



Ensure that the marker discs do not work too deeply in the soil. If the track markers work too deeply danger of damage in a rough, stony seed bed.

5.7.1.1 How to determine the track marker arm length for tracing a track in the tractor's centre

The track marker spacing A (Fig. 96/2), measured from the implement centre to contact point of the marker disc on the soil corresponds to the working width.

Track marker spacing $A = R \times n$

R = Row spacing

n = Number of sowing units

Example:

Row spacing R = 75 cm

Number of sowing units n = 4

Track marker dimension A = R x n = 75 cm x 4

A = 300 cm

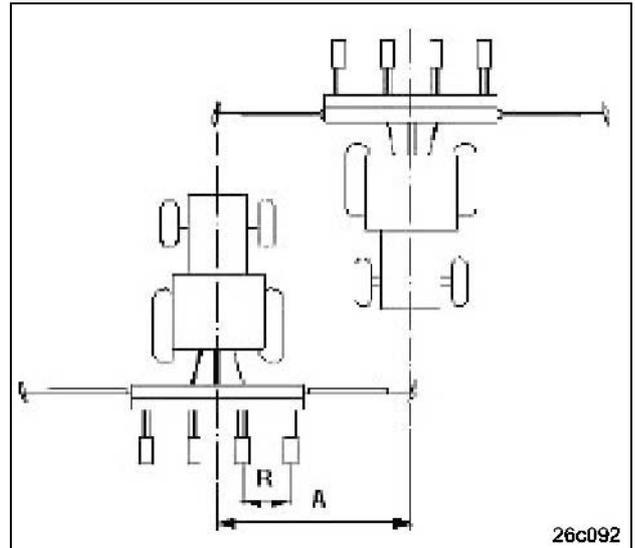


Fig. 96

5.7.1.2 How to determine the track marker arm length for tracing a track in the tractor's wheel mark centre

How to determine the track marker spacing (Fig. 97/2), The track marker spacing with symmetric arrangement of the coulters.

Track marker dimension A = Working width B	Tractor wheel mark $\frac{S}{2}$
--	-------------------------------------

Working width B = Number of rows n x row spacing R
--

Track marker dimension A = R x n	$\frac{S}{200}$
----------------------------------	-----------------

R = Row spacing

n = Number of sowing units

S = Tractor wheel mark

Example:

Row spacing R = 75 cm

Number of sowing units n = 4

Tractor wheel mark S = 150 cm

$$\text{Track marker dimension A} = R \times n \times \frac{S}{200}$$

$$\text{Track marker dimension A} = 75 \text{ cm} \times 4 \times \frac{150 \text{ cm}}{200} = 225 \text{ cm}$$

5.7.2 Setting the marker arm length on the ED 302

The marker arm length can only be set for tracing a track in the tractor's centre. Proceed as follows:

- Slacken clamping bolts (Fig. 98/1)
- Pull out marker arm (Fig. 98/2) in the necessary length
- Slacken clamping bolt (Fig. 98/3) and pull out marker disc (Fig. 98/4).
Adjust the working intensity by turning the track markers that on light soils they operate about parallel to the direction of travel and on heavy soils more "on grip" so that they work more aggressively and create a clear trace.
- Retighten clamping bolts firmly.

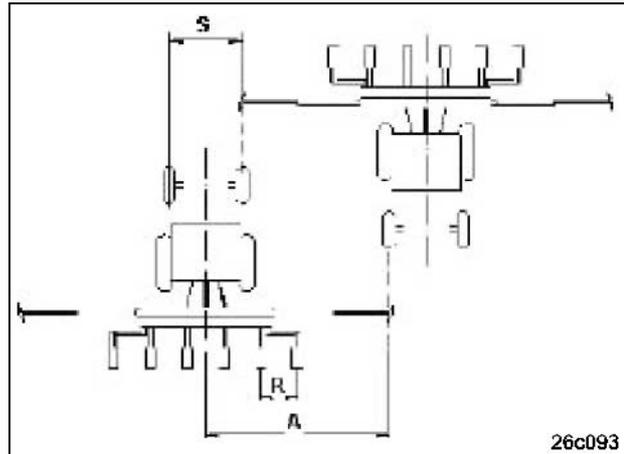


Fig. 97

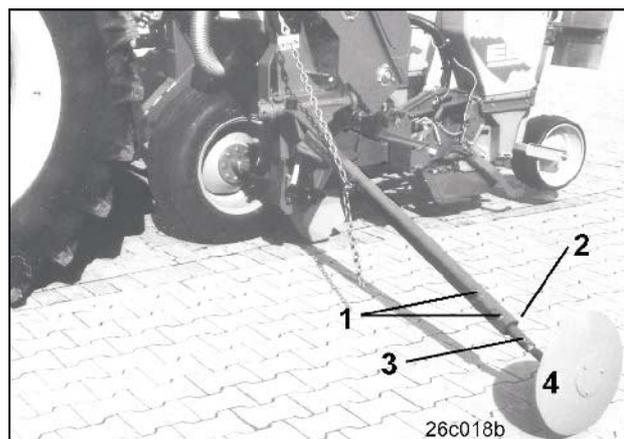


Fig. 98

5.7.3 Setting the length of the track markers for ED 452, ED 452-K, ED 602, ED 602-K

The length can be set in the tractor track and also in the tractor's wheel mark centre.

Setting on the tractor's track

- Pull the sprung loaded trip (Fig. 99/1) and pull out the telescopic marker arm tube (Fig. 99/2) until the trip catches for the first time.

Setting on the tractor's wheel mark centre

- Pull again the sprung loaded trip (Fig. 99/1) and pull out the telescopic marker arm tube (Fig. 99/2) further until the trip catches again.

For length setting fine tuning

- Slacken the clamping bolt (Fig. 99/3), pull out the marker disc (Fig. 99/4) and turn if necessary to vary the working intensity that on light soils they follow about parallel with the direction of operation on heavy soils move them to provide more angle "on grip", so that they work more aggressive and create a clearly visible mark.
- Firmly retighten clamping bolt.

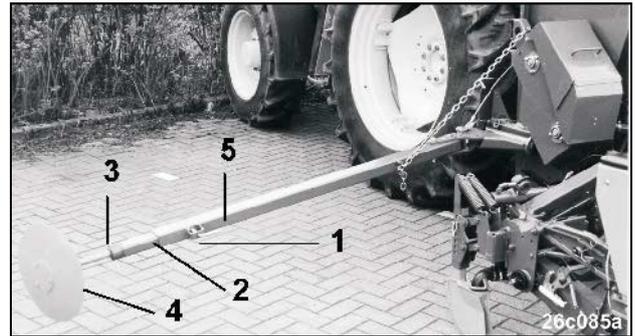


Fig. 99



In case the track markers have been set to trace a mark in the tractor's centre slide the telescopic marker arms into each other completely before travelling with the ED 602-K on public roads as otherwise the permissible transport width of 3 m would be exceeded.



If the implement is lifted and the marker arms pulled out, the height of 4 m is exceeded during the folding procedure.

5.7.4 Setting the track marker length on ED 902-K

The length can only be set in the tractor's wheel mark centre.

- Slacken the clamping bolts (Fig. 100/1)
- Pull out track marker disc (Fig. 100/2) and turn if necessary to vary the working intensity that on light soils they follow about parallel with the direction of operation on heavy soils move them to provide more angle "on grip", so that they work more aggressive and create a clearly visible mark.
- Firmly retighten clamping bolt (Fig. 100/1)
- When changing the working width (example: 18x45 cm => 8,1m working width) replace the marker arm end section (Fig. 100/3) by a shorter one.

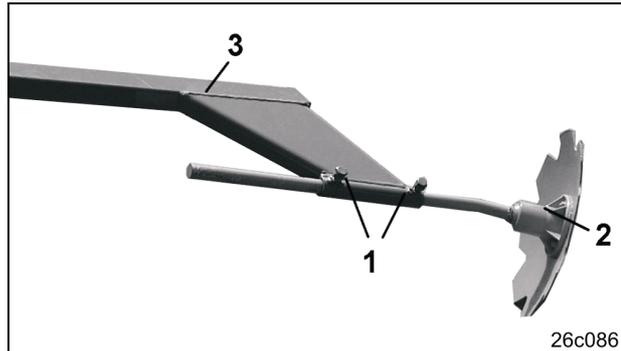


Fig. 100

5.7.5 Setting the marker depth on ED 302, ED 452, ED 452-K and ED 602

- Place the implement on level soil, bring into working position and fold down the track marker.
- Reinsert the chains (Fig. 101/1) to limit the working depth of the track markers to 60 till 80 mm
- Secure the chain on the marker arm tube by using a spring clip.



Fig. 101

5.7.6 Setting the marker depth on ED 602-K

- Deposit the implement on level soil, bring implement into working position and fold down the marker arm.
- Set the turnbuckle (Fig. 102/1) on the marker arm in such a way that the marker discs will just reach the soil.
- Shorten the turnbuckle by approx. one turn so that the marker arm is further lowered (approx. 60 to 80 mm).
- Secure the turnbuckle by using a counter nut (Fig. 102/2).

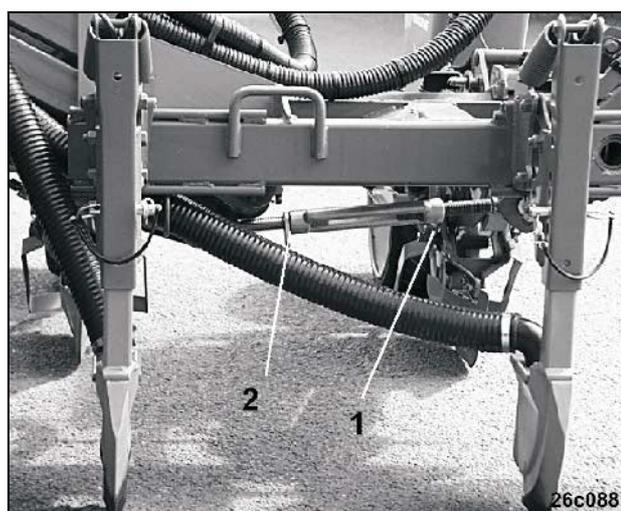


Fig. 102

5.7.7 Setting the marker depth on ED 902-K

- Deposit the implement on level soil, bring implement into working position and fold down the marker arm.
- Slacken the counter nut (Fig. 103/3)
- Turn stop nut (Fig. 103/2) until the main track marker arm (Fig. 103/1) has reached a horizontal position.
- Secure setting by using a counter nut (Fig. 103/3).

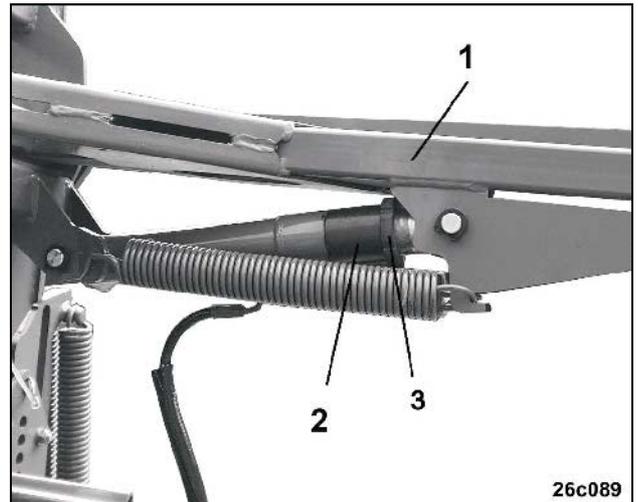


Fig. 103

- Slacken the bolts (Fig. 104/2) and set the actuating bracket (Fig. 104/1) in such a way that the marker disc penetrates for approx. 50 mm into the soil.
- Firmly tighten (Fig. 104/2) the bolts.

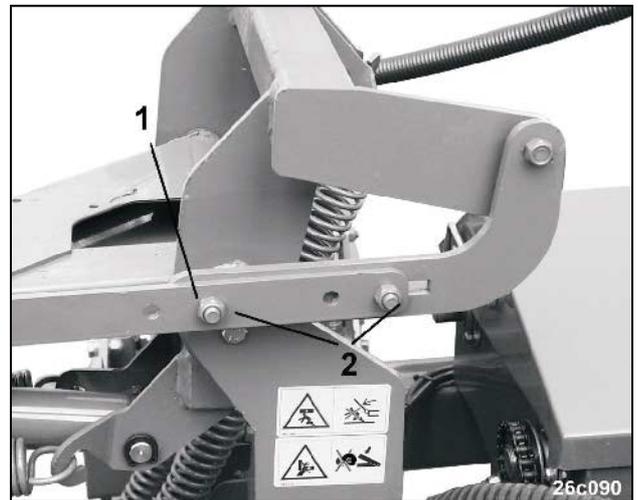


Fig. 104

5.7.8 Setting the track marker lifting speed

On the track markers for the ED the lifting speed of the track markers can be set with the aid of an adjustable throttle valve (Fig. 105/1).

Procedure:

- Turn the setting screw clockwise:
Lifting speed is reduced.
- Turn the setting screw counter clockwise:
Lifting speed is increased.



Too quick a lifting of the track markers would cause mechanical damage.

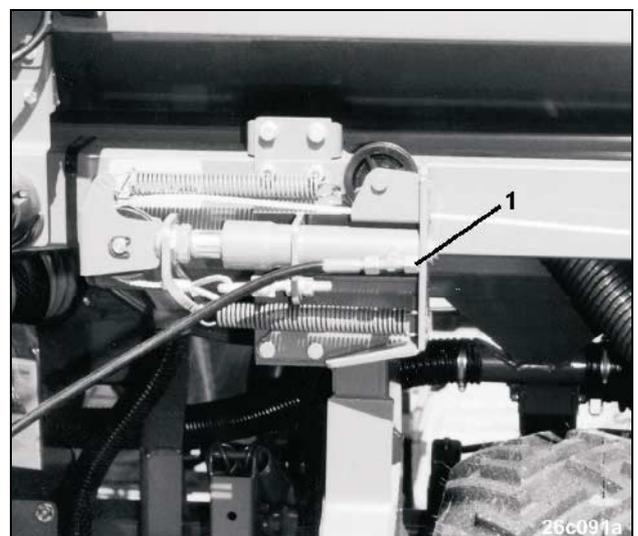


Fig. 105

5.8 Setting the grain spacing

The grain spacing depends on

- the number of the desired grains (plants) per m²
- the desired row spacing
- the singling disc used
- the chosen chain wheel pair of the setting gearbox (Fig. 106/1) and
- the chosen reduction gear "X" or "Y" or "Z" which can be set at the secondary transmission (Fig. 106/3).

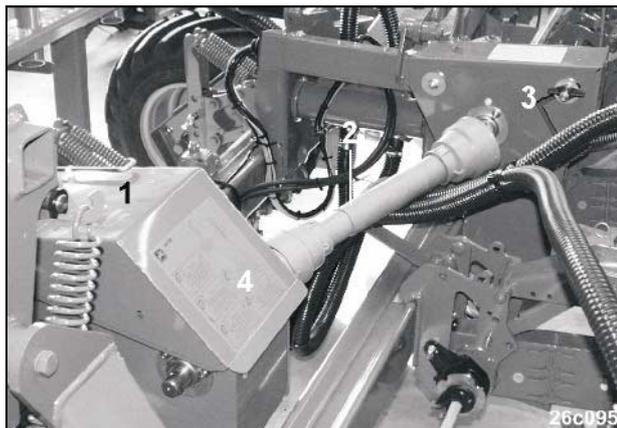


Fig. 106

Take the setting values for the reduction gear "X" and "Y" from the gearbox setting table (Fig. 106/4). Grain spacings in a 36 step find tuning from 3,1 to 53,8 cm can be set.

The reduction gear "Z" (special option) allows the setting of grain spacings up to 86,9 cm. The setting is carried out according to the gearbox setting table for the reduction gear "Z".

Example

Calculate grain spacing "a" [cm] according to

- the desired number of "grains (plants) per m²" and
- for the desired row spacing "R".

Number of grains: 95.000 grains per hectare
 Row spacing R: 0,75 m
 Singling disc: 30 holes

95.000 grains per hectare =
 9,5 grains per m² [G per m²]

$$\text{Grain spacing a [cm]} = \frac{1}{\text{grains per m}^2 \times \text{row spacing R [m]}} \times 100$$

$$\text{Grain spacing a [cm]} = \frac{1}{9,5 \times 0,75 \text{ [m]}} \times 100$$

$$\text{Grain spacing a [cm]} = 14,04 \text{ cm}$$

Table (Fig. 107) contains the necessary setting values for each individual singling disc.

Choose from the table for the singling disc with 30 holes the grain spacing $a = 14,04$ cm or a grain spacing nearest to the calculated grain spacing if the desired value is not mentioned.

In our example the value in the table is 13,9 cm.

According to the table for the grain spacing 13,9 cm result :

Chain wheel pairing:.....A – 3

Secondary transmission:.....Y

Set the chain wheel pairing in the gearbox as illustrated in table (Fig. 107) and attach the PTO shaft on to the required entrance of the secondary transmission.

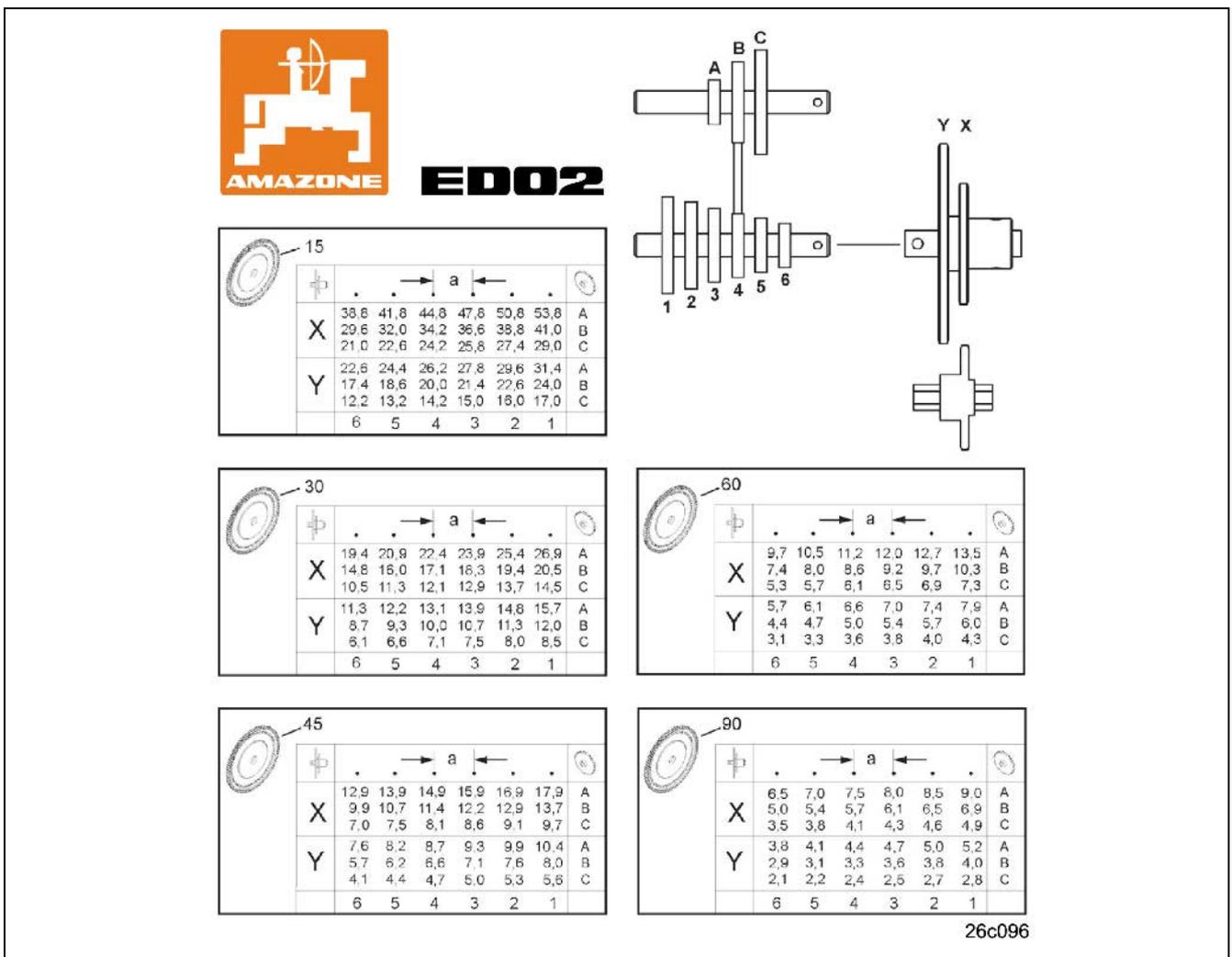


Fig. 107

5.8.1 Setting the chain wheel pairing in the setting gearbox

- Open the gearbox lid and secure against unintended closing.
- Take the calibration crank (Fig. 108/1) and insert into the quadrant tube (Fig. 108/2) .



Fig. 108

Turn the calibration crank (Fig. 109/1) in counter clockwise direction until the connecting shaft (Fig. 109/2) of the chain tensioning unit catches on the right and left hand side into the gaps (Fig. 109/3) .



Hold the calibration crank firmly. Until the connecting shaft catches, the full spring load burdens the entire chain tensioning unit.

Unlock the chain tensioning unit (Fig. 109/4) by

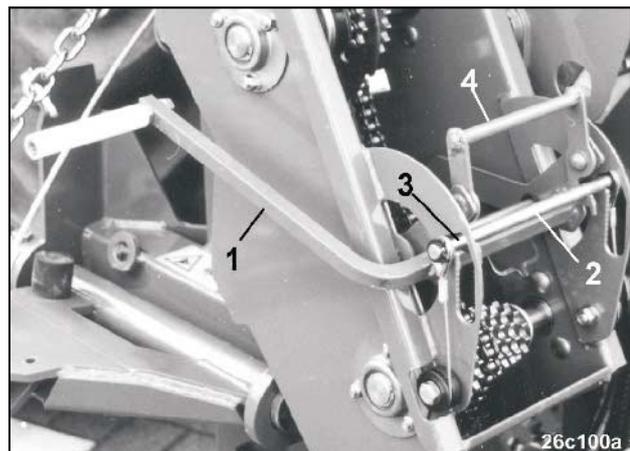


Fig. 109

swivelling the trip with your free hand into position (Fig. 110/1).

Swivel the calibration crank (Fig. 110/2) into the illustrated final position and thus release the chain tensioning unit.

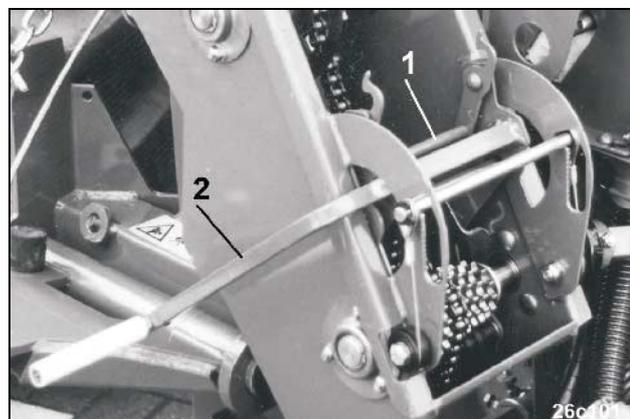


Fig. 110

Take the hook (Fig. 111/1) for shifting the chain (Fig. 111/2) from its retainer on the gearbox.

Swivel the leverage (Fig. 111/3) of the drive shaft (Fig. 111/4) and locate the chain (Fig. 111/2) with the aid of the hook (Fig. 111/1) on the relevant chain wheel (A, B, C).

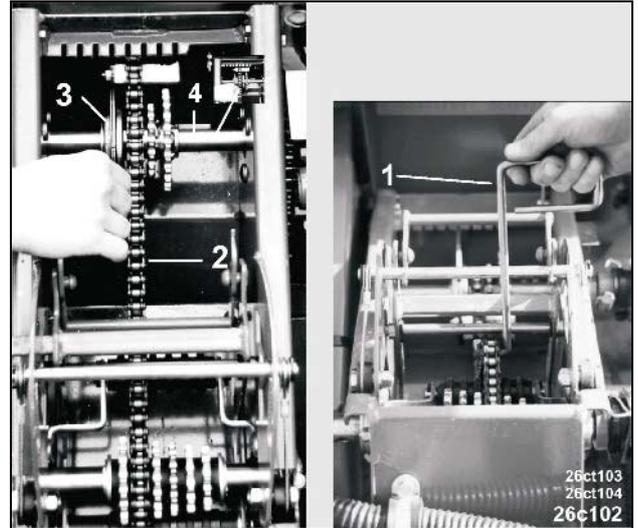


Fig. 111

To achieve the necessary chain wheel pairing locate the chain (Fig. 112/1) onto the relevant chain wheel (Fig. 112/2 to Fig. 112/7) of the drive shaft (Fig. 112/8).

While doing this, align the shifting shaft (Fig. 112/9) in such a way that the chain wheels of the driving and power take off PTO shaft are in accurate alignment and the chain is guided by the individual guides of the guide roller (Fig. 112/10) without toeing.

Swivel the nose of the leverage (Fig. 112/11) into the appropriate key (Fig. 112/12) of the axial securing (Fig. 112/13).

After use reinsert the hook (Fig. 111/1) into the retainer of the gearbox.

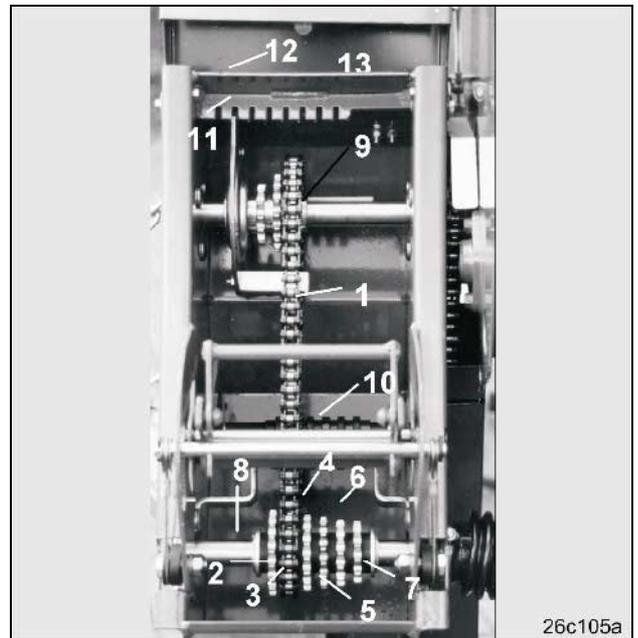


Fig. 112

Swivel the calibration crank back into position according to Figure (Fig. 113).

Lock the chain tensioning unit by swivelling and letting the trip (Fig. 113/1) catch underneath the connecting shaft (Fig. 113/2) .



Fig. 113

Slightly turn the calibration crank in counter clockwise direction, take with your free hand the trip (Fig. 114/1) and lever the connecting shaft (Fig. 114/2) of the chain tensioning unit out of the gaps (Fig. 114/3).



Hold the calibration crank firmly. After leverage of the connecting shaft the full spring load burdens the entire chain tensioning unit.

Take the calibration crank off the square tube and insert into the provided retainer..

Close gearbox lid.

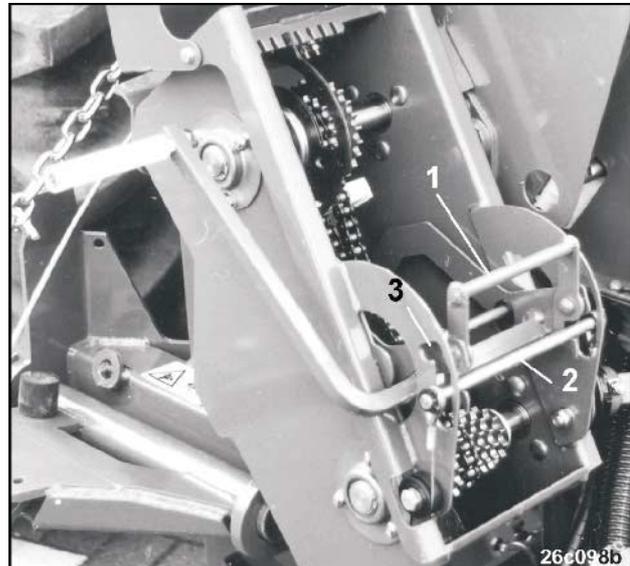


Fig. 114

5.8.2 Chain wheel change in the secondary transmission

For the chain wheel change "X" and "Y" in the secondary transmission proceed as follows

- Release tensioning spring (Fig. 115/1) using the lever (Fig. 115/2)
- Slacken thumb nut (Fig. 115/3)
- Move the tensioning roller along the slide block (Fig. 115/4)
- Take circlip (Fig. 115/5) off the hole
- Move the step chain wheel on the drive shaft (Fig. 115/6) and locate the chain on the relevant chain wheel.
- Apply circlip (Fig. 115/5) and secure
- Locate the tensioning roller (Fig. 115/4) in it's earlier position
- Secure thumb nut (Fig. 115/3)
- Tension the tensioning spring (Fig. 115/1) using the lever (Fig. 115/2) .

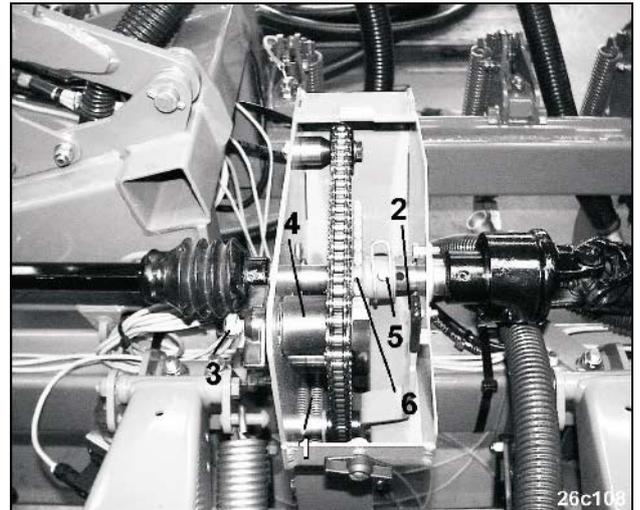


Fig. 115

5.8.3 Determining "grains per hectare"

The number of "grains per hectare" depends on:

- the chosen row spacing R and
- the desired train spacings a (plant spacings) within the row.

Example:

Row spacing R: 75 cm

Grain spacing a: 14,8 cm

$\text{Grains per ha} = \frac{10.000}{a \text{ [m]} \times R \text{ [m]}}$
--

$$\text{Grains per ha} = \frac{10.000}{0,148 \text{ [m]} \times 0,75 \text{ [m]}}$$

Grains per ha = 90090 G/ha

5.8.4 Determining the "grains per hectare" following the review tables

The review tables on the following pages are a guide for the easy determination of the number of "**grains per hectare**" for singling discs with 15, 30, 45, 60 and 90 holes for row spacings of: 100 cm, 80 cm, 75 cm, 60 cm, 50 cm, 45 cm and 30 cm.

In the review tables the number of "grains per hectare" depends on:

- the number of holes per singling disc
- the chosen entrance on the secondary gearbox
- the desired grain spacing a
- the desired row spacing R



For grain spacings and / or row spacings not shown in the tables determine the "grains per hectare" according to para. 5.8.3.

Review table grains / ha - singling disc 15 holes

Entrance	grain-spacing a [cm]	grains/m	grains/ha at row spacing R						
			100 cm	80 cm	75 cm	60 cm	50 cm	45 cm	30 cm
Y	12,2	8,2	81967	102459	109290	136612	163934	182149	273224
	13,2	7,6	75758	94697	101010	126263	151515	168350	252525
	14,2	7,0	70423	88028	93897	117371	140845	156495	234742
	15,0	6,7	66667	83333	88889	111111	133333	148148	222222
	16,0	6,3	62500	78125	83333	104167	125000	138889	208333
	17,0	5,9	58824	73529	78431	98039	117647	130719	196078
	17,2	5,8	58140	72674	77519	96899	116279	129199	193798
	18,6	5,4	53763	67204	71685	89606	107527	119474	179211
	20,0	5,0	50000	62500	66667	83333	100000	111111	166667
	21,4	4,7	46729	58411	62305	77882	93458	103842	155763
	22,6	4,4	44248	55310	58997	73746	88496	98328	147493
	24,0	4,2	41667	52083	55556	69444	83333	92593	138889
	24,4	4,1	40984	51230	54645	68306	81967	91075	136612
	26,2	3,8	38168	47710	50891	63613	76336	84818	127226
	27,8	3,6	35971	44964	47962	59952	71942	79936	119904
	29,6	3,4	33784	42230	45045	56306	67568	75075	112613
31,4	3,2	31847	39809	42463	53079	63694	70771	106157	
X	21,0	4,8	47619	59524	63492	79365	95238	105820	158730
	22,6	4,4	44248	55310	58997	73746	88496	98328	147493
	24,2	4,1	41322	51653	55096	68871	82645	91827	137741
	25,8	3,9	38760	48450	51680	64599	77519	86133	129199
	27,4	3,6	36496	45620	48662	60827	72993	81103	121655
	29,0	3,4	34483	43103	45977	57471	68966	76628	114943
	29,6	3,4	33784	42230	45045	56306	67568	75075	112613
	32,0	3,1	31250	39063	41667	52083	62500	69444	104167
	34,2	2,9	29240	36550	38986	48733	58480	64977	97466
	36,6	2,7	27322	34153	36430	45537	54645	60716	91075
	38,4	2,6	26042	32552	34722	43403	52083	57870	86806
	41,0	2,4	24390	30488	32520	40650	48780	54201	81301
	41,8	2,4	23923	29904	31898	39872	47847	53163	79745
	44,8	2,2	22321	27902	29762	37202	44643	49603	74405
	47,8	2,1	20921	26151	27894	34868	41841	46490	69735
50,8	2,0	19685	24606	26247	32808	39370	43745	65617	
53,8	1,9	18587	23234	24783	30979	37175	41305	61958	
Z	33,9	3,0	29486	36857	39315	49143	58973	65524	98287
	36,6	2,8	27358	34197	36477	45597	54716	60796	91195
	39,0	2,5	25641	32050	34187	42734	51280	56978	85467
	41,6	2,4	24015	30020	32021	40026	48032	53369	80053
	44,3	2,2	22586	28232	30114	37642	45170	50189	75284
	46,9	2,1	21315	26644	28421	35525	42631	47367	71050
	47,9	2,1	20896	26119	27861	34826	41791	46435	69652
	51,6	1,9	19370	24213	25827	32284	38741	43046	64568
	55,2	1,8	18114	22643	24152	30190	36229	40254	60381
	59,2	1,7	16903	21128	22537	28171	33806	37562	56343
	62,7	1,6	15938	19923	21251	26564	31877	35419	53128
	66,1	1,5	15121	18901	20161	25202	30242	33603	50403
	67,5	1,5	14825	18532	19767	24709	29651	32946	49418
	72,4	1,4	13822	17277	18429	23036	27644	30715	46072
	77,2	1,3	12945	16182	17260	21575	25890	28767	43150
82,0	1,2	12201	15252	16269	20335	24403	27114	40670	
86,9	1,2	11513	14391	15350	19189	23026	25584	38376	

Review table grains / ha - singling disc 30 holes

Entrance	grain-spacing a [cm]	grains/m	grains/ha at row spacing R						
			100 cm	80 cm	75 cm	60 cm	50 cm	45 cm	30 cm
Y	6,1	16,4	163934	204918	218579	273224	327869	364299	546448
	6,6	15,2	151515	189394	202020	252525	303030	336700	505051
	7,1	14,1	140845	176056	187793	234742	281690	312989	469484
	7,5	13,3	133333	166667	177778	222222	266667	296296	444444
	8,0	12,5	125000	156250	166667	208333	250000	277778	416667
	8,5	11,8	117647	147059	156863	196078	235294	261438	392157
	8,7	11,5	114943	143678	153257	191571	229885	255428	383142
	9,3	10,8	107527	134409	143369	179211	215054	238949	358423
	10,0	10,0	100000	125000	133333	166667	200000	222222	333333
	10,7	9,3	93458	116822	124611	155763	186916	207684	311526
	11,3	8,8	88496	110619	117994	147493	176991	196657	294985
	12,0	8,3	83333	104167	111111	138889	166667	185185	277778
	12,2	8,2	81967	102459	109290	136612	163934	182149	273224
	13,1	7,6	76336	95420	101781	127226	152672	169635	254453
	13,9	7,2	71942	89928	95923	119904	143885	159872	239808
	14,8	6,8	67568	84459	90090	112613	135135	150150	225225
15,7	6,4	63694	79618	84926	106157	127389	141543	212314	
X	10,5	9,5	95238	119048	126984	158730	190476	211640	317460
	11,3	8,8	88496	110619	117994	147493	176991	196657	294985
	12,1	8,3	82645	103306	110193	137741	165289	183655	275482
	12,9	7,8	77519	96899	103359	129199	155039	172265	258398
	13,7	7,3	72993	91241	97324	121655	145985	162206	243309
	14,5	6,9	68966	86207	91954	114943	137931	153257	229885
	14,8	6,8	67568	84459	90090	112613	135135	150150	225225
	16,0	6,3	62500	78125	83333	104167	125000	138889	208333
	17,1	5,8	58480	73099	77973	97466	116959	129955	194932
	18,3	5,5	54645	68306	72860	91075	109290	121433	182149
	19,4	5,2	51546	64433	68729	85911	103093	114548	171821
	20,5	4,9	48780	60976	65041	81301	97561	108401	162602
	20,9	4,8	47847	59809	63796	79745	95694	106326	159490
	22,4	4,5	44643	55804	59524	74405	89286	99206	148810
	23,9	4,2	41841	52301	55788	69735	83682	92980	139470
	25,4	3,9	39370	49213	52493	65617	78740	87489	131234
26,9	3,7	37175	46468	49566	61958	74349	82610	123916	
Z	17,0	5,9	58973	73715	78630	98287	117944	131050	196574
	18,3	5,5	54716	68396	72956	91195	109433	121593	182388
	19,5	5,1	51280	64100	68373	85467	102560	113956	170934
	20,8	4,8	48032	60040	64042	80053	96064	106737	160106
	22,1	4,6	45170	56462	60227	75284	90340	100379	150567
	23,5	4,2	42631	53288	56841	71050	85261	94735	142102
	23,9	4,1	41791	52240	55721	69652	83583	92870	139305
	25,8	3,8	38741	48426	51655	64568	77482	86091	129137
	27,6	3,6	36229	45286	48305	60381	72457	80508	120763
	29,6	3,4	33806	42257	45074	56343	67611	75123	112686
	31,4	3,2	31877	39847	42502	53128	63754	70837	106256
	33,1	3,0	30242	37803	40323	50403	60484	67205	100807
	33,7	3,0	29651	37063	39535	49418	59302	65890	98836
	36,2	2,8	27644	34554	36857	46072	55286	61429	92145
	38,6	2,5	25890	32363	34520	43150	51780	57534	86301
	41,0	2,4	24403	30503	32536	40670	48805	54228	81341
43,4	2,3	23026	28783	30702	38376	46052	51169	76754	

Review table grains / ha - singling disc 45 holes

Entrance	grain-spacing a [cm]	grains/m	grains/ha at row spacing R						
			100 cm	80 cm	75 cm	60 cm	50 cm	45 cm	30 cm
Y	4,1	24,4	243902	304878	325203	406504	487805	542005	813008
	4,4	22,7	227273	284091	303030	378788	454545	505051	757576
	4,7	21,3	212766	265957	283688	354610	425532	472813	709220
	5,0	20,0	200000	250000	266667	333333	400000	444444	666667
	5,3	18,9	188679	235849	251572	314465	377358	419287	628931
	5,6	17,9	178571	223214	238095	297619	357143	396825	595238
	5,7	17,5	175439	219298	233918	292398	350877	389864	584795
	6,2	16,1	161290	201613	215054	268817	322581	358423	537634
	6,6	15,2	151515	189394	202020	252525	303030	336700	505051
	7,1	14,1	140845	176056	187793	234742	281690	312989	469484
	7,6	13,2	131579	164474	175439	219298	263158	292398	438596
	8,0	12,5	125000	156250	166667	208333	250000	277778	416667
	8,2	12,2	121951	152439	162602	203252	243902	271003	406504
	8,7	11,5	114943	143678	153257	191571	229885	255428	383142
	9,3	10,8	107527	134409	143369	179211	215054	238949	358423
9,9	10,1	101010	126263	134680	168350	202020	224467	336700	
10,4	9,6	96154	120192	128205	160256	192308	213675	320513	
X	7,0	14,3	142857	178571	190476	238095	285714	317460	476190
	7,5	13,3	133333	166667	177778	222222	266667	296296	444444
	8,1	12,3	123457	154321	164609	205761	246914	274348	411523
	8,6	11,6	116279	145349	155039	193798	232558	258398	387597
	9,1	11,0	109890	137363	146520	183150	219780	244200	366300
	9,7	10,3	103093	128866	137457	171821	206186	229095	343643
	9,9	10,1	101010	126263	134680	168350	202020	224467	336700
	10,7	9,3	93458	116822	124611	155763	186916	207684	311526
	11,4	8,8	87719	109649	116959	146199	175439	194932	292398
	12,2	8,2	81967	102459	109290	136612	163934	182149	273224
	12,9	7,8	77519	96899	103359	129199	155039	172265	258398
	13,7	7,3	72993	91241	97324	121655	145985	162206	243309
	13,9	7,2	71942	89928	95923	119904	143885	159872	239808
	14,9	6,7	67114	83893	89485	111857	134228	149142	223714
	15,9	6,3	62893	78616	83857	104822	125786	139762	209644
16,9	5,9	59172	73964	78895	98619	118343	131492	197239	
17,9	5,6	55866	69832	74488	93110	111732	124146	186220	
Z	11,3	8,8	88458	110573	117944	147431	176917	196574	294861
	12,2	8,3	82286	102858	109716	137145	164574	182859	274289
	13,1	7,6	76366	95459	101822	127278	152734	169704	254556
	13,6	7,3	73715	92145	98287	122859	147431	163812	245717
	14,7	6,8	68045	85056	90726	113409	136090	151211	226816
	15,6	6,4	63946	79932	85261	106577	127892	142102	213152
	16,0	6,3	62442	78051	83255	104068	124882	138758	208137
	17,2	5,8	58006	72507	77341	96676	116011	128901	193351
	18,4	5,4	54436	68045	72581	90726	108872	120969	181453
	19,7	5,1	50790	63487	67719	84649	101579	112865	169299
	20,8	4,8	48032	60040	64042	80053	96064	106737	160106
	22,1	4,6	45170	56462	60227	75284	90340	100379	150567
	22,4	4,5	44601	55751	59467	74335	89202	99113	148669
	24,0	4,1	41628	52035	55504	69379	83255	92505	138758
	25,7	3,9	38883	48604	51844	64805	77765	86406	129609
27,3	3,6	36604	45754	48805	61005	73207	81341	122012	
28,9	3,5	34576	43221	46102	57628	69154	76837	115256	

Review table grains / ha - singling disc 60 holes

Entrance	grain-spacing a [cm]	grains/m	grains/ha at row spacing R						
			100 cm	80 cm	75 cm	60 cm	50 cm	45 cm	30 cm
Y	3,1	32,8	327869	409836	437158	546448	655738	728597	1092896
	3,3	30,3	303030	378788	404040	505051	606061	673401	1010101
	3,6	28,2	281690	352113	375587	469484	563380	625978	938967
	3,8	26,7	266667	333333	355556	444444	533333	592593	888889
	4,0	25,0	250000	312500	333333	416667	500000	555556	833333
	4,3	23,5	235294	294118	313725	392157	470588	522876	784314
	4,4	23,0	229885	287356	306513	383142	459770	510856	766284
	4,7	21,5	215054	268817	286738	358423	430108	477897	716846
	5,0	20,0	200000	250000	266667	333333	400000	444444	666667
	5,4	18,7	186916	233645	249221	311526	373832	415369	623053
	5,7	17,7	176991	221239	235988	294985	353982	393314	589971
	6,0	16,7	166667	208333	222222	277778	333333	370370	555556
	6,1	16,4	163934	204918	218579	273224	327869	364299	546448
	6,6	15,3	152672	190840	203562	254453	305344	339271	508906
	7,0	14,4	143885	179856	191847	239808	287770	319744	479616
7,4	13,5	135135	168919	180180	225225	270270	300300	450450	
7,9	12,7	127389	159236	169851	212314	254777	283086	424628	
X	5,3	19,0	190476	238095	253968	317460	380952	423280	634921
	5,7	17,7	176991	221239	235988	294985	353982	393314	589971
	6,1	16,5	165289	206612	220386	275482	330579	367309	550964
	6,5	15,5	155039	193798	206718	258398	310078	344531	516796
	6,9	14,6	145985	182482	194647	243309	291971	324412	486618
	7,3	13,8	137931	172414	183908	229885	275862	306513	459770
	7,4	13,5	135135	168919	180180	225225	270270	300300	450450
	8,0	12,5	125000	156250	166667	208333	250000	277778	416667
	8,6	11,7	116959	146199	155945	194932	233918	259909	389864
	9,2	10,9	109290	136612	145719	182149	218579	242866	364299
	9,7	10,3	103093	128866	137457	171821	206186	229095	343643
	10,3	9,8	97561	121951	130081	162602	195122	216802	325203
	10,5	9,6	95694	119617	127592	159490	191388	212653	318979
	11,2	8,9	89286	111607	119048	148810	178571	198413	297619
	12,0	8,4	83682	104603	111576	139470	167364	185960	278940
12,7	7,9	78740	98425	104987	131234	157480	174978	262467	
13,5	7,4	74349	92937	99133	123916	148699	165221	247831	
Z	8,5	11,8	117944	147431	157259	196574	235889	262099	393148
	9,1	10,9	109433	136791	145911	182388	218866	243184	364777
	9,8	10,2	102067	127584	136090	170112	204135	226816	340225
	10,5	9,6	95631	119539	127507	159384	191261	212512	318768
	11,1	9,0	89958	112447	119943	149929	179916	199906	299859
	11,8	8,5	84920	106150	113227	141533	169840	188711	283067
	12,0	8,4	83583	104478	111444	139305	167165	185739	278609
	12,9	7,7	77482	96852	103309	129137	154963	172182	258273
	13,8	7,2	72211	90264	96281	120352	144421	160469	240703
	14,8	6,8	67611	84515	90149	112686	135223	150248	225371
	15,7	6,4	63563	79453	84750	105938	127125	141251	211876
	16,6	6,1	60312	75391	80417	100521	120625	134028	201042
	16,9	5,9	59302	74127	79069	98836	118604	131781	197673
	18,1	5,5	55286	69108	73715	92145	110573	122859	184288
	19,3	5,2	51780	64726	69041	86301	103561	115068	172602
21,5	4,7	46557	58197	62077	77595	93114	103460	155190	
21,9	4,6	45754	57193	61005	76257	91509	101676	152514	

Review table grains / ha - singling disc 90 holes

Entrance	grain-spacing a [cm]	grains/m	grains/ha at row spacing R						
			100 cm	80 cm	75 cm	60 cm	50 cm	45 cm	30 cm
Y	2,1	48,8	487805	609756	650407	813008	975610	1084011	1626016
	2,2	45,5	454545	568182	606061	757576	909091	1010101	1515152
	2,4	42,6	425532	531915	567376	709220	851064	945626	1418440
	2,5	40,0	400000	500000	533333	666667	800000	888889	1333333
	2,7	37,7	377358	471698	503145	628931	754717	838574	1257862
	2,8	35,7	357143	446429	476190	595238	714286	793651	1190476
	2,9	35,1	350877	438596	467836	584795	701754	779727	1169591
	3,1	32,3	322581	403226	430108	537634	645161	716846	1075269
	3,3	30,3	303030	378788	404040	505051	606061	673401	1010101
	3,6	28,2	281690	352113	375587	469484	563380	625978	938967
	3,8	26,3	263158	328947	350877	438596	526316	584795	877193
	4,0	25,0	250000	312500	333333	416667	500000	555556	833333
	4,1	24,4	243902	304878	325203	406504	487805	542005	813008
	4,4	23,0	229885	287356	306513	383142	459770	510856	766284
	4,7	21,5	215054	268817	286738	358423	430108	477897	716846
	5,0	20,2	202020	252525	269360	336700	404040	448934	673401
	5,2	19,2	192308	240385	256410	320513	384615	427350	641026
X	3,5	28,6	285714	357143	380952	476190	571429	634921	952381
	3,8	26,7	266667	333333	355556	444444	533333	592593	888889
	4,1	24,7	246914	308642	329218	411523	493827	548697	823045
	4,3	23,3	232558	290698	310078	387597	465116	516796	775194
	4,5	22,1	220994	276243	294659	368324	441989	491099	736648
	4,9	20,6	206186	257732	274914	343643	412371	458190	687285
	5,0	20,2	202020	252525	269360	336700	404040	448934	673401
	5,4	18,7	186916	233645	249221	311526	373832	415369	623053
	5,7	17,5	175439	219298	233918	292398	350877	389864	584795
	6,1	16,4	163934	204918	218579	273224	327869	364299	546448
	6,5	15,5	155039	193798	206718	258398	310078	344531	516796
	6,9	14,6	145985	182482	194647	243309	291971	324412	486618
	7,0	14,4	143885	179856	191847	239808	287770	319744	479616
	7,5	13,4	134228	167785	178971	223714	268456	298285	447427
	8,0	12,6	125786	157233	167715	209644	251572	279525	419287
8,5	11,8	118343	147929	157791	197239	236686	262985	394477	
9,0	11,2	111732	139665	148976	186220	223464	248293	372439	
Z	5,7	17,7	176917	221145	235889	294861	353833	393148	589723
	6,1	16,5	164574	205717	219431	274289	329148	365720	548579
	6,6	15,3	152734	190917	203646	254556	305468	339408	509112
	6,8	14,8	147431	184288	196574	245717	294861	327623	491435
	7,3	13,6	136090	170112	181453	226816	272179	302421	453632
	7,8	12,7	127892	159864	170523	213152	255783	284204	426305
	8,0	12,5	124882	156103	166510	208137	249765	277516	416275
	8,7	11,6	116011	145014	154681	193351	232022	257802	386703
	9,2	10,9	108872	136090	145162	181453	217743	241937	362906
	9,9	10,2	101579	126973	135439	169299	203158	225731	338596
	10,5	9,6	96064	120079	128085	160106	192126	213474	320211
	11,1	9,0	90340	112926	120454	150567	180681	200756	301135
	11,2	8,9	89202	111502	118936	148669	178403	198226	297339
	12,1	8,3	83255	104068	111006	138758	166510	185011	277516
	12,9	7,7	77765	97207	103687	129609	155531	172812	259218
13,7	7,3	73207	91509	97609	122012	146414	162682	244023	
14,5	6,9	69154	86441	92204	115256	138306	153673	230510	

5.9 Settings on the row fertiliser applicator

5.9.1 Setting the fertiliser application rate

To achieve the desired fertiliser application rate, carry out three different settings:

- Setting the gearbox setting lever
- Shutter slide position
- Bottom flap position

5.9.1.1 Fertiliser setting chart

The speed of the metering shaft and thus the fertiliser application rate can be infinitely variably set on the setting lever (Fig. 116/6) of the gearbox.

For this setting please refer to the fertiliser setting chart (Fig. 117).



Fig. 116



The values in the fertiliser setting chart apply to the working widths of 3,0 m, 4,5 m and 6,0 m.



The values in the fertiliser setting chart are mean values. They may deviate due to grain size, grain shape and bulk density. We recommend that you carry out a calibration test in any case.

Fertiliser setting chart						
Kind of fertiliser	Diammon-phosphat 18-46-0	CAN 27,5 % N	Urea 46 % N	NPK 13+13+21 BASF	Triple Super- phosphat	MAP 12-52
Bulk density [kg/l]	0,94	1,02	0,76	1,18	0,98	1,02
Gearbox setting number	Application rate [kg/ha]					
5	27	28	23	39	24	13
10	62	76	52	79	74	53
15	93	110	78	112	112	88
20	126	149	104	151	147	130
25	162	183	131	185	184	166
30	190	218	156	216	217	204
35	220	252	182	253	249	230
40	250	284	204	285	287	268
45	277	317	228	323	322	306
50	311	356	256	362	357	320
55	339	382	279	394	390	349
60	377	440	306	433	421	383
65	400	457	334	473	460	417
70	434	494	363	514	493	458
75	464	547	374	552	535	477
80	478	553	390	559	546	486
	The values in the fertiliser setting chart only apply for 8, 12 or 16 outlets and the indicated working widths.					
	8 outlets	16 metering units	3,00 m working width			
	12 outlets	24 metering units	4,50 m working width			
	16 outlets	32 metering units	6,00 m working width			
	All shutters are $\frac{3}{4}$ open					

Fig. 117



In case the number of outlets and/or the working width deviate from the indicated values in table (Fig. 117) convert the shown gearbox setting figure for the desired fertiliser application rate [kg/ha] according to the following formula:

Example:

Kind of fertiliser: Diammonphosphat
Desired application rate: 250 kg/ha

Standard execution:

Sowing units (number): 4
Row spacing: 75 cm
Number of outlets: 8
Working width: 3 m (4 x 75cm)
Read off gearbox setting figure.: 40

Changed execution:

Number of sowing units: 6
Row spacing: 45 cm
Number of outlets: 12
Working width: 2,70 m (6 x 45)

Conversion of the gearbox setting figure for the changed execution:

$$\text{Conversion factor} = \frac{\text{Number of actual outlets}}{\text{Number of standard outlets}} \times \frac{\text{Standard working width [m]}}{\text{Actual working width [m]}}$$

$$\text{Conversion factor} = \frac{12}{8} \times \frac{3,00 \text{ [m]}}{2,70 \text{ [m]}} = 1,667$$

$$\text{Gearbox setting No. for changed application rate} = \frac{\text{Gearbox setting No. for standard execution}}{\text{Conversion factor}}$$

$$\text{Gearbox setting No. for changed application rate} = \frac{40}{1,667} = 24$$

For spreading the desired spread rate of 250 kg/ha set the gearbox setting lever on to the scale figure 24.

5.9.1.2 Setting the gearbox setting lever

By adjusting the gearbox setting lever (Fig. 118/1) the fertiliser rate to be spread can be set. Proceed as follows:

- Slacken the knob (Fig. 118/3) by turning counter clockwise
- Swivel the gearbox setting lever downwards (towards the biggest scale figure) and swivel it upwards from below into the desired position according to the fertiliser setting chart.
- Retighten knob firmly.

The higher the figure on the scale (Fig. 118/2), the bigger the fertiliser spread rate will be.



The values in the fertiliser setting chart are only mean values. Deviations may occur due to grain size, grain shape and bulk density. In any case, we recommend that you carry out a calibration test..

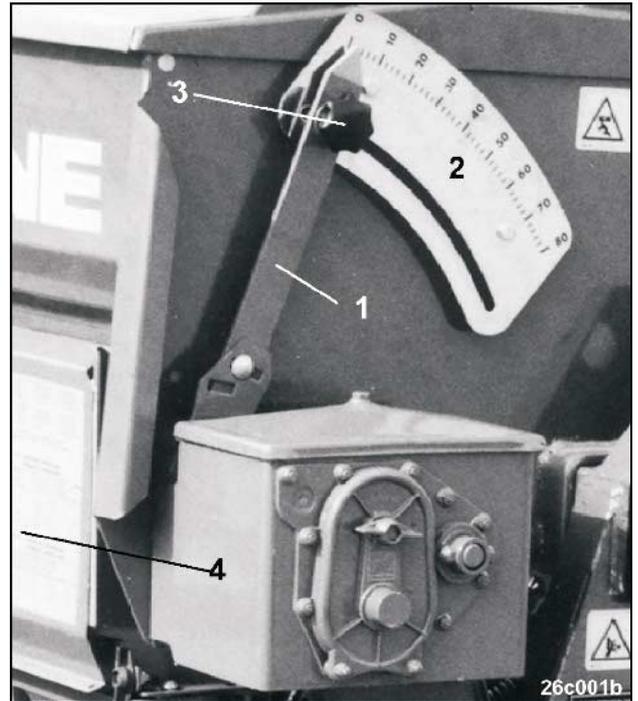


Fig. 118

5.9.2 Setting the shutter slide

The shutter slides (Fig. 119/1) may catch in three different positions:

closed	•	3/4 open	•	open
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All shutter slides must be in the position "3/4 open".

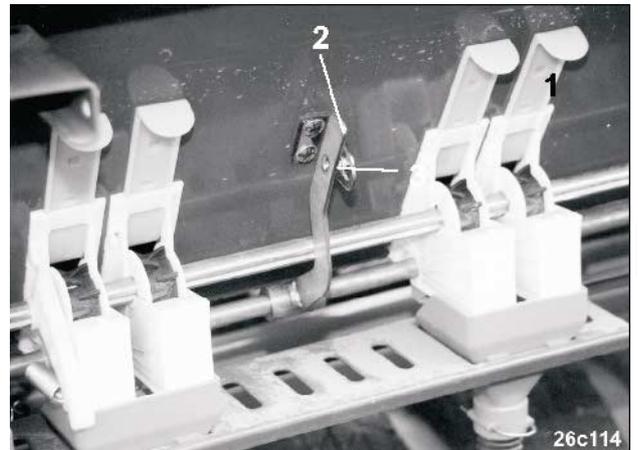


Fig. 119

5.9.3 Setting the bottom flaps

For fertiliser metering the lever (Fig. 119/2) catches on the bolt (Fig. 119/3).

With the aid of the lever (Fig. 119/2) the bottom flaps can be opened, e. g. for cleaning the implement.

5.9.4 Calibration test to check the set fertiliser application rate

At the calibration test the shaft (Fig. 120/1) of the running wheels is turned clockwise with the aid of the calibration crank (Fig. 120/2) and thus the travel in the field is simulated. Collect the fertiliser rate (from all fertiliser coulters or just from one fertiliser coulters) and check whether the desired and the actual fertiliser application rate correspond.



The collected fertiliser quantity corresponds to that spread on an area of 1/10 or 1/40 ha.



Fig. 120

Carry out the calibration test as follows:

- Shutter slide position is "¾ open"
- Check whether both bottom flap levers are engaged
- Set the gearbox setting lever
- Insert the calibration crank into shaft (Fig. 120/1 or Fig. 121/1) and turn clockwise according to the crank turns indicated in table (Fig. 122).

The number of crank turns depends on the working width and the tyres of the implement.



Fig. 121

Crank turns on the wheel				
Working width		3,0 m	4,5 m	6,0 m
Tyres				
6.00-16	1/10 ha	159,0	---	---
	1/40 ha	39,8	---	---
10.0/75-15	1/10 ha	147,0	98,0	---
	1/40 ha	36,8	24,5	---
31x15,5x15	1/10 ha	136,0	90,7	64,3
	1/40 ha	34,0	22,7	16,1

Fig. 122

Converting the crank turns for other working widths:

Example:

Serial execution working width: 3,00 m
 Serial execution working width: 2,70 m
 Tyres: 6.00-16
 Crank turns: 39,8 for 1/40 ha

Conversion factor =	$\frac{\text{serial execution working width [m]}}{\text{actual working width [m]}}$
---------------------	---

$$\text{Conversion factor} = \frac{3 \text{ [m]}}{2,70 \text{ [m]}} = 1,11$$

$\text{Crank turns (actual)} = \text{Crank turns (Fig. 122)} \times \text{conversion factor}$

Crank turns (actual) = 39,8 x 1,11 = 44,2

For the changed working width the number of crank turns is 44.2.

The fertiliser amount is collected in all fertiliser coulters

Weigh the collected fertiliser amount [kg] and multiply by the factor "10" (1/10 ha) or "40" (1/40).

The resulting fertiliser application rate corresponds to the fertiliser application rate in [kg/ha].

The fertiliser quantity is collected on one fertiliser coulters only

Shut the shutter slides of the other metering housings. Weigh the collected fertiliser quantity [kg] and multiply by the number of fertiliser coulters and with the factor "10" (1/10 ha) or "40" (1/40).

The resulting fertiliser application rate corresponds to the fertiliser application rate in [kg/ha].

5.9.5 Setting the dragging and double disc fertiliser coulters

The fertiliser coulters (Fig. 123/1) have been fitted to the profile rail (Fig. 123/3) by means of fixing clamps (Fig. 123/2).

In the factory the fertiliser coulters have been fitted in a distance of 6 cm towards the sowing coulters of the sowing units. The spacings can be adjusted infinitely variably as on the sowing units.

The placement depth of the fertiliser can be individually set by the depth setting device (Fig. 123/4) of the fertiliser coulters. Set the depth of the fertiliser coulters by using inserting pins (Fig. 123/5).

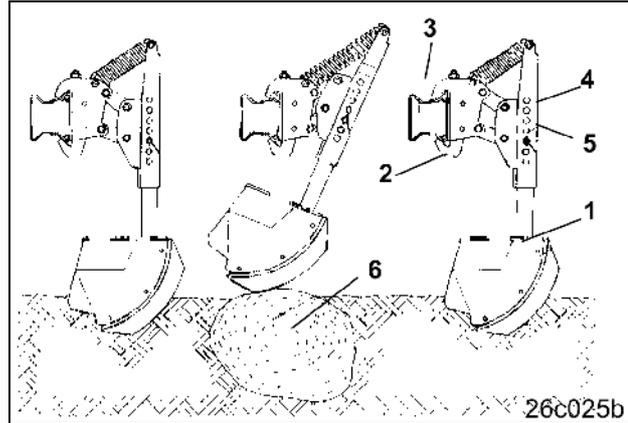


Fig. 123



Danger of squeezing.

For setting the placement depth of the fertiliser coulters you have to work under and between the devices of the lifted implement. This means danger of squeezing for the entire body.

Therefore secure the lifted implement against unintended lowering by using appropriate supports.



When hitting an obstacle (Fig. 123/6) in the soil, the fertiliser coulters give way upwards to the rear and to the side.

Each two fertiliser hoses lead to the fertiliser coulters.

Only each one hose leads to the fertiliser coulters of the booms of the ED 452, ED 452-K and ED 602-K.



Ensure that the hoses are not sagging which could result in a fertiliser blockage inside the hose. If necessary shorten the hoses.

5.10 Hydraulic track width adjustment on the ED 602-K

The hydraulic track width adjustment (Fig. 124/1) of the ED 602-K allows the setting of different support wheel track widths. Depending on the row spacing and tyre type the track width of the support wheels can be individually set so that the support wheels always run in between the rows.

Depending on the row spacing and tyre type different fitting positions (Fig. 124/a-d) on the frame (Fig. 124/2) result for the hydraulic ram (Fig. 124/1).

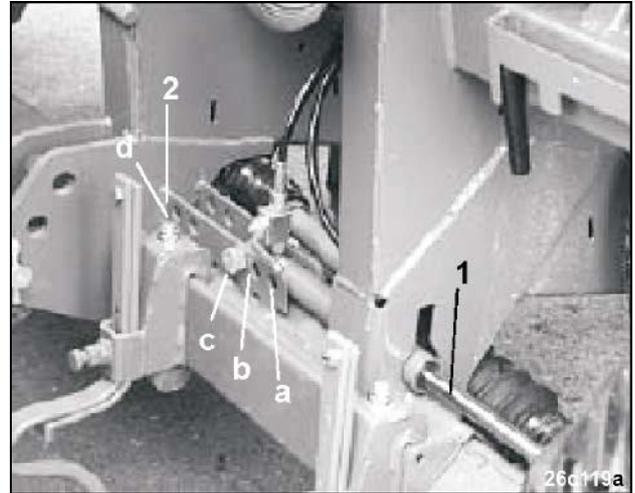


Fig. 124

These fitting positions can be seen in table (Fig. 125).

Fitting position	Row spacing
a	80 cm
b	77,5 cm
c	75 cm
d	45/50 cm

Fig. 125

To secure the set track width, shut the block tap (Fig. 126/1).

In the position as illustrated the block tap is open.

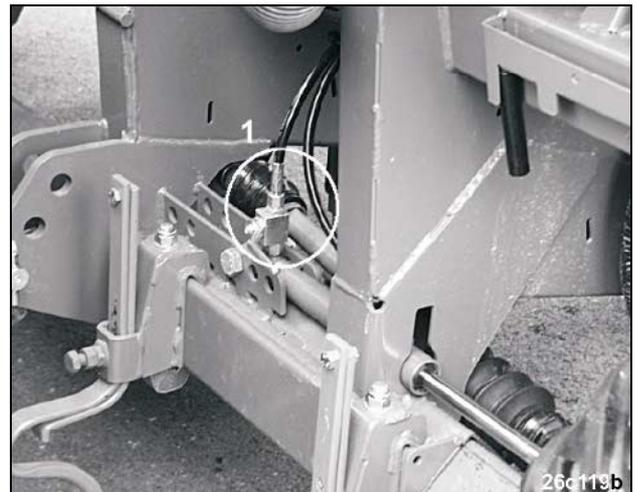


Fig. 126

5.11 Setting the vacuum

The vacuum provided by the suction blower fan depends on the power take off of the tractor PTO shaft. (see para. "Drive of the blower fan with different tractor universal joint shaft speeds").



Set the tractor PTO shaft speed in such a way that the pointer (Fig. 127/1) of the pressure gauge (Fig. 127/2) is in the centre of the green range (Fig. 127/3) at about 65 up to 80 mbar.

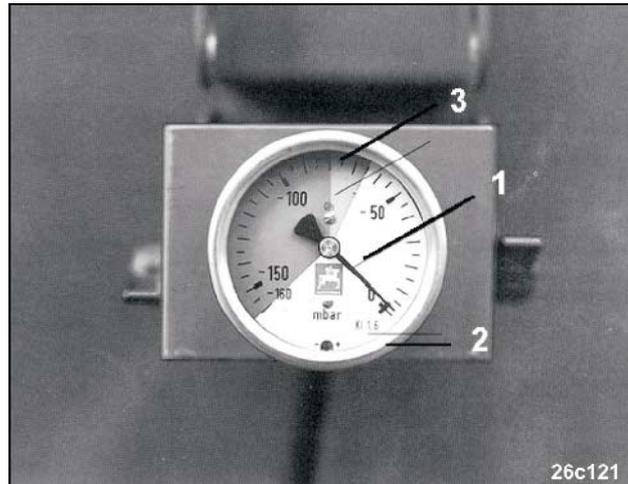


Fig. 127



Exceeding the indicated highest permissible PTO shaft speed will result in an increased wear of the suction blower fan. Simultaneously inaccurate double coverage – depending on the seed – may occur.

Undercutting the indicated PTO shaft speed may result in gaps during the sowing procedure.

However, for manoeuvring at the headlands, the PTO shaft speed can be reduced to this indicated minimum PTO shaft speed without resulting in a seed grain drop off the singling disc.

Within this speed range the suction pressure is reduced to 35 to 40 mbar.



When using the red singling disc (special option for field beans) set the PTO shaft speed in such a way that the pointer (Fig. 127/1) is positioned nearly in the red range.

Standard implement execution for connection to the PTO shaft with 1000 R.P.M. (please also refer to para: "Drive of the blower fan with different tractor universal joint shaft speeds").

- The required vacuum of 65 up to 80 mbar is achieved in the PTO shaft speed range of 950 up to 1050 R.P.M.



**Highest permissible PTO shaft speed
1100 R.P.M.**



**Minimum PTO shaft speed at the head-lands
690 up to 722 R.P.M.**

Implement execution for connection to the tractor PTO shaft with 710 RPM (reduced tractor engine speed (please also refer to para: "Drive of the blower fan with different tractor universal joint shaft speeds").

- The required vacuum of 65 up to 80 mbar is achieved within the PTO shaft speed range of 660 up to 740 R.P.M.



**Highest permissible PTO shaft speed
800 R.P.M.**



**Minimum PTO shaft speed on the head-lands
485 up to 505 R.P.M.**

Implement execution for connecting to the tractor PTO shaft with 540 R.P.M. (please also refer to para: "Drive of the blower fan with different tractor universal joint shaft speeds").

- The required vacuum of 65 up to 80 mbar is achieved at a PTO shaft speed range of 510 up to 570 R.P.M.



**Highest permissible PTO shaft speed
600 R.P.M.**



**Minimum PTO shaft speed at the head-lands
375 up to 390 R.P.M.**

5.12 Setting the compressed air jet

The fertiliser delivery to the outer fertiliser coulters is achieved by compressed air.

On the ED 452, ED 602 and ED 902 the metered fertiliser is delivered to the relevant injector (Fig. 128/1) and then delivered to the outer fertiliser coulters with the aid of the compressed air jet of the compressed air blower fan (Fig. 128/2).



In case the fertiliser is blown out of the outer fertiliser coulters, reduce the compressed air jet with the aid of the screen (Fig. 128/3) i.e. reduce the diameter released by the screen.



Fig. 128

6. Transport on public roads and ways

Please observe the following hints. They help to prevent accidents in public road traffic.



The vehicles driving, steering- and braking behaviour are affected by mounted or towed implements and ballast weights. It must be ensured that the vehicle steers and brakes correctly.

When lifting a three-point mounted implement the front axle of the tractor is differently relieved of load, depending on the tractor type and size.

Observe the necessary front axle load (20 % of the tractor's net weight).

If necessary fit front weights to the tractor.



The tractor used must have sufficient capacity for the additional rear axle load which is already very high when the implement is empty. Therefore the transport on public roads is only permissible with an empty implement.



For implements with a transport width of more than 3.0 m apply for an authorisation if necessary.

6.1 Required identification

At the front and at the rear warning plates on the right and left hand side according to DIN 11 030 or parking plates.

- The transport width of 3 m must not be exceeded.
- Fit required traffic light kit with rear reflectors, front limiting lights and license plate carrier and check for proper function.
- At the front and at the rear fit warning plates on the right and left hand side according to DIN 11 030 or parking plates.
- As option available: complete, firmly mounted equipment with parking plates, front limiting lights, rear lights, rear reflectors and license plate carrier.
- Tractor and implement should correspond to the national road transport and traffic rules. The vehicle owner and operator are responsible for adhering to the legal traffic rules.

6.2 Conversions on the implement before road transport

only for ED 302, 452, 602

- Fold upwards the individual sowing units into transport position and secure them against unintended lowering.
- Bring the marker arms into transport position and secure by using a clip pin. (Fig. 129/1).

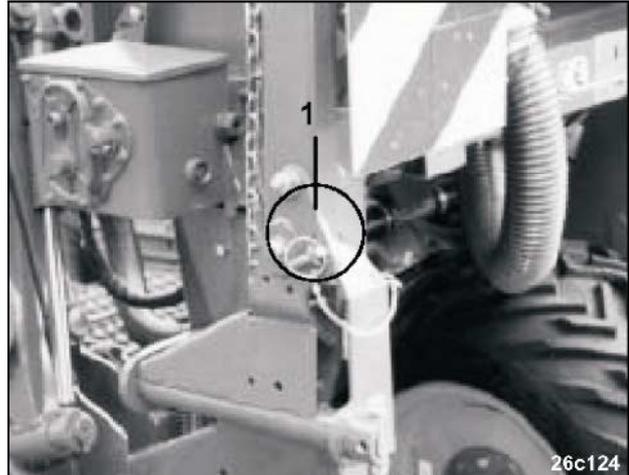


Fig. 129



Danger of squeezing and shearing between marker arm and implement. Never reach into the danger area as long as parts are still moving.



Never stay underneath an upwards folded, not secured track marker arm.

Only ED 452-K

- Fold upwards the individual sowing units into the transport position and secure.
- Bring the track marker arms into transport position and secure by using a clip pin (Fig. 129/1).
- Close block tap (vertical track marker folding).
- Swivel upwards the outer sowing units into transport position with the aid of the hydraulic ram (Fig. 130/1) and lock them in this position by using pins (Fig. 130/2).

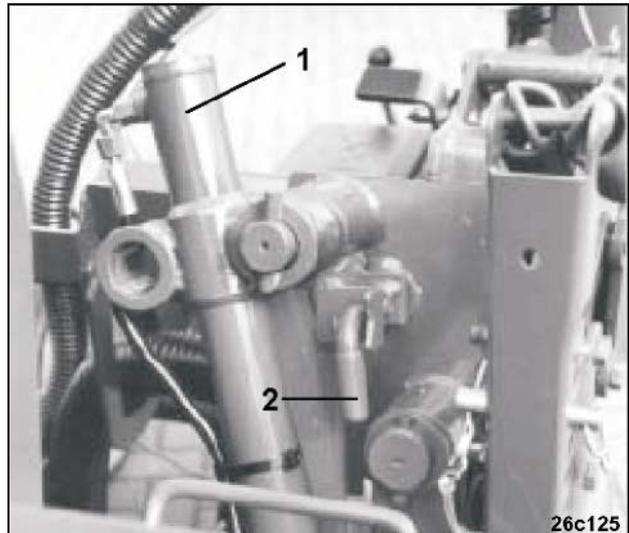


Fig. 130



Before folding up and down the outer sowing units advise people to leave the danger area within the vicinity of the sowing unit. Danger of squeezing.



For folding up and down the outer sowing units keep the lever on the control unit of the tractor in the position "lifting" or "lowering" until the sowing units are entirely folded in or out.

When releasing the lever the folding procedure will be immediately stopped.

- For unlocking swivel the pin (Fig. 131/1) into the position as illustrated.



Fig. 131

only ED 602-K:

- Fold upwards the individual sowing units into the transport position and secure.
- Fold upwards the marker arm entirely.



In order not to exceed the transport width of 3 m entirely slide in the telescopic marker arms, provided the marker arms have been set for tracing a mark in the tractor's centre.

- On machines with vertical track marker folding, shut block tap (Fig. 132/1).

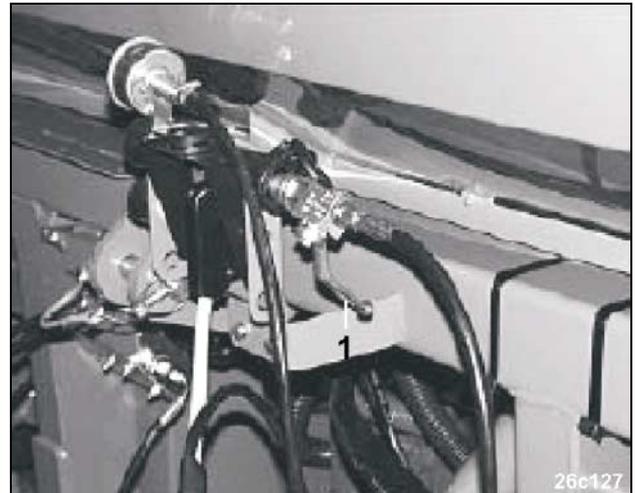


Fig. 132

- Swivel upwards the outer sowing units into transport position with the aid of the hydraulic ram (Fig. 133/1) and lock in this position by using the trip (Fig. 133/2) as illustrated.

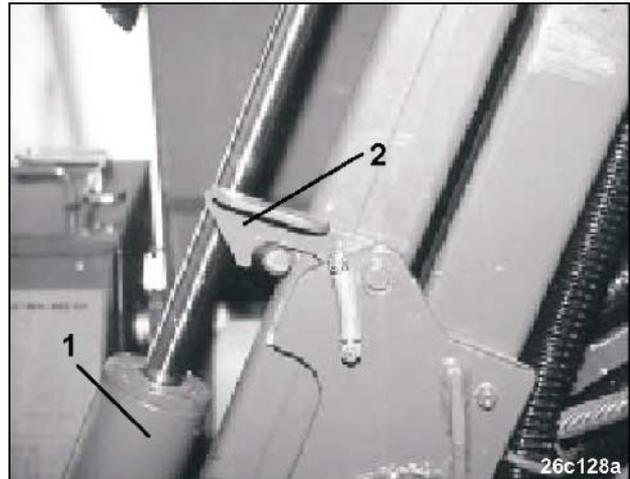


Fig. 133

- Shut the block tap of the hydraulic track width adjustment for transport position locking lever (Fig. 134/1) as illustrated.

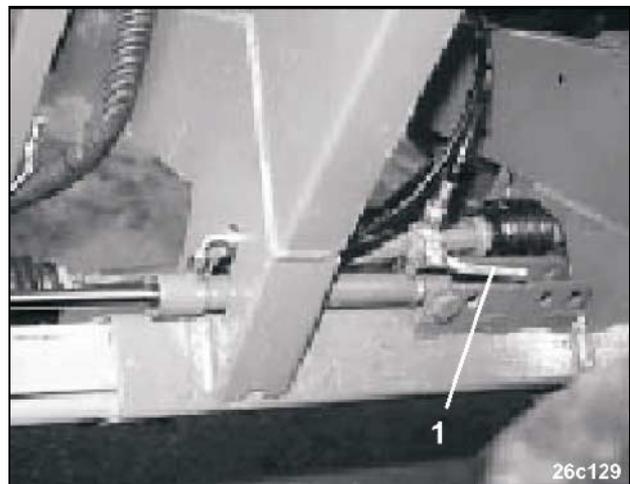


Fig. 134

only ED 902-K:

Fold upwards the individual sowing units into the transport position and secure.



In order to ensure a trouble free folding, the implement should be folded in and out in one operational procedure.



The oil quantity required for folding in and out should be set to min. 20 l/min.

Too low an oil quantity (< 15 l/min) may result in singling inaccuracies and thus in a collision of the units during the folding procedure.



Ensure for the folding procedure that the booms arrive their final positions. The folding procedure may slow down in the final stage.



During folding procedure the implement reaches a height of more than 4 m .



Never fold the machine underneath overhead power lines.



After the folding procedure shut the block tap (Fig. 135/1) to secure the implement against unintended lowering during transport.



Fig. 135

Pressure rollers with following furrow closers

Before travelling on public roads swivel upwards the following furrow closers into transport position. Proceed as follows:

- Unhook the spring (Fig. 136/1).
- Remove clip pin.
- Pull out the pin (Fig. 136/2).
- Swivel the furrow closers (Fig. 136/3) upwards and secure in this transport position by inserting the pin (Fig. 136/2).



Before travelling on public roads ensure that the following closers are in the transport position.

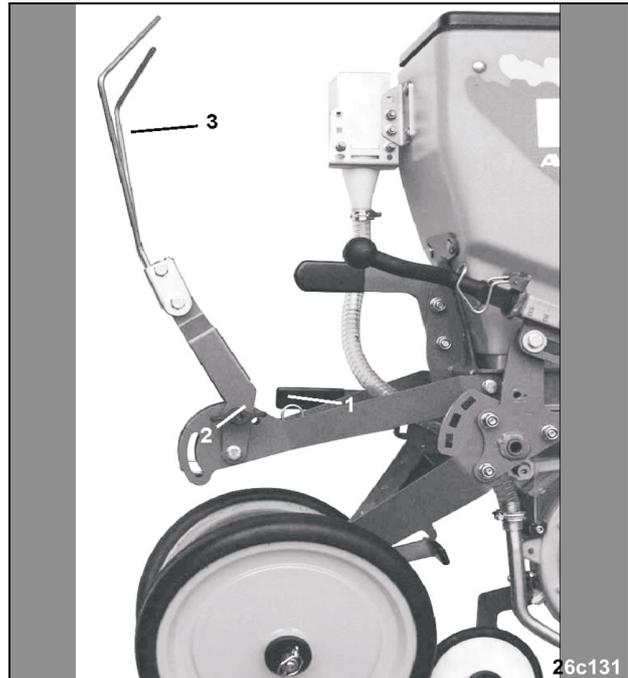


Fig. 136

Filling auger (special option)

Shut the block tap (Fig. 137/1) of the filling auger (special option) to lock the hydraulic ram (Fig. 137/2) against unintended lowering of the filling auger.

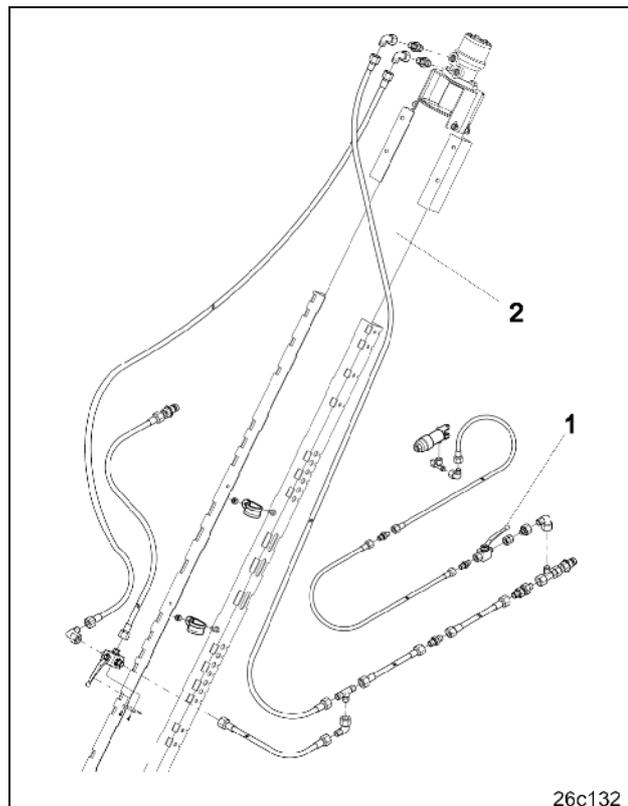


Fig. 137

7. Putting to operation



Danger of injury in folding area of the marker arms between markers and implement frame. Never reach into the squeezing area as long as parts are still moving.



It is prohibited to stay beneath a lifted, not secured track marker arm.

7.1 Hints for seed



Do not use moist or sticky seed



It has been experienced that incrusting the seed, e. g. with "Mesorol", must be done with utmost care.



To avoid bridging ensure that the flowing property of the seed is maintained as far as possible.



Incrust the seed early enough (1 day before the intended sowing) so that the seed is sown in dry condition.



The flowing property of the incusted seed can be improved by adding about 200 g talcum powder for 100 kg seed.



Strictly observe the mixture ratio given in the instruction advice of the crop agent manufacturer.



When filling the seed hopper ensure that the seed is free from foreign particles (wire, stones, pieces of wood etc.).

7.2 Putting to operation ED 302, ED 452 and ED 602

Folding down track markers:

- Unlock the track markers from transport position.
- Open block tap for track marker folding.
- Actuate the lever on the control unit of the tractor, to fold down the track marker (Fig. 138).
- Actuate the control unit on the tractor until the track marker on the correct side is in operation.
- Check the working depth of the track markers.



Fig. 138

26c133

7.3 Putting to operation ED 452-K, 602-K and ED 902-K

Only ED 602-K:

Open both block taps (Fig. 139/1) on the transport securing device for the hydraulic track width adjustment.

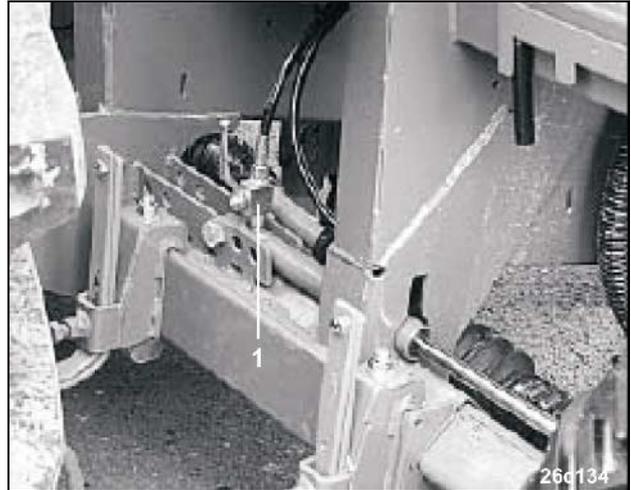


Fig. 139



When actuating the outer sowing units advise people to leave the operational area (danger of squeezing).



When the lever of the control unit or the keys (Profi control) is/are released the folding procedure of the sowing units is stopped immediately.



The outer sowing units are automatically hydraulically locked in the folded down position.



Only lower ED 602-K machines to the ground when the hydraulic track width adjustment has been driven out.



On machines with control unit the boom and track marker coupling are linked. Before the folding procedure recheck the control unit and readjust if necessary.

Only ED 902-K:

When folding down the ED 902-K the drive connection of the inner segment is ensured via an automatically engaging coupling (Fig. 140/1).



Only start to operate the ED 902-K implements after the machine has completely been folded down.

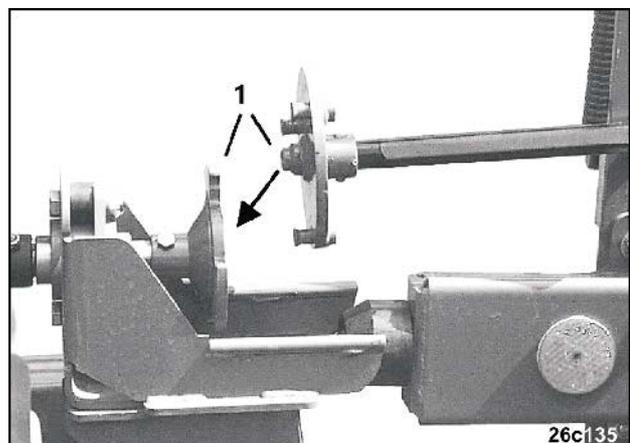


Fig. 140

Folding down the outer sowing units

- Unlock the outer sowing units from transport position (Fig. 141/1) ED 452-K and (Fig. 142/1) ED 602-K.
- Open the block tap for the folding procedure ED 902-K.
- Hold the lever of the control unit of the tractor in position "lowering" until the machine has completely been folded down.

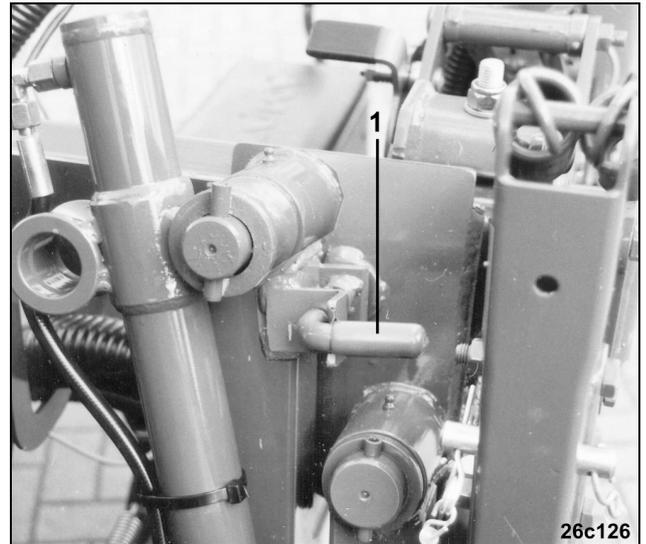


Fig. 141

Folding down track marker

- On the ED 452-K unlock the track markers from the transport position.
- Open block tack for track marker folding.
- Actuate the lever of the control unit on the tractor to fold down the track marker.
- If necessary change the marking sides of the track marker by actuating the control unit on the tractor.
- Check working depth of the track marker.



Fig. 142

7.4 Lower sowing units and engage their drive

- Unlock the transport locking (Fig. 143/1) by releasing the spiral spring.
- Lift the sowing unit until the pin (Fig. 143/2) automatically slides out of the gap (Fig. 143/3) .
- Slowly lower the sowing units to engage their drive.



Fig. 143

7.5 Fold down following furrow closers into working position

- Remove spring cotter pin.
- Pull out pin (Fig. 144/1).
- Fold downwards the furrow closer (Fig. 144/2) and secure in working position by inserting the pin (Fig. 144/1). Secure using a clip pin.



Lead the pin through the eye of the spring.

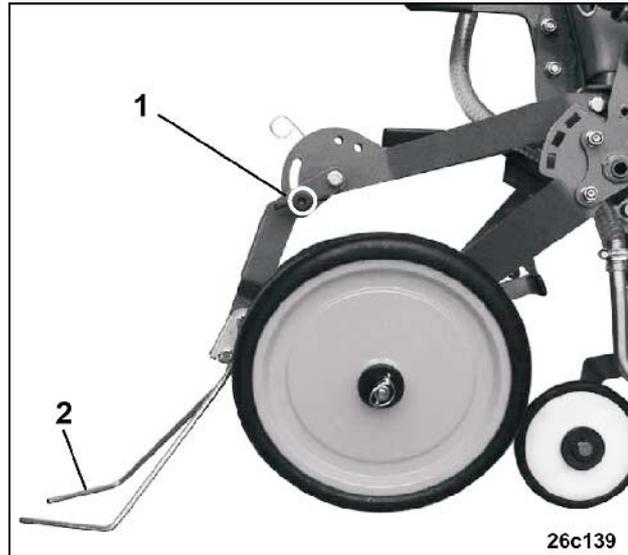


Fig. 144

7.6 Setting the row fertiliser applicator into operation

- Open the fertiliser hopper lid (Fig. 145/1) and lock in opened position (see Fig. 145).
- Fill the fertiliser hopper from the rear.
- For shutting the lid briefly release the locking device (Fig. 145/2) and carefully shut the lid.



Couple the Airplanter on to the tractor before filling the fertiliser hopper.



Fig. 145

- The seed metering wheels (Fig. 146/2) are arranged on the metering shaft (Fig. 146/1). They are driven by the shaft (Fig. 146/3) of the running wheels via the chain drive (Fig. 146/4) and the setting gearbox (Fig. 146/5) for the fertiliser application.

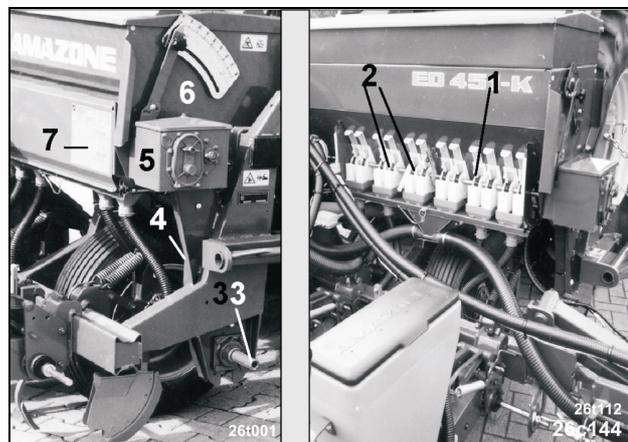


Fig. 146

7.7 Starting sowing operation

When starting to drive lower the implement with the aid of the rear hydraulics and operate in float position.

After having travelled a short distance check the seed placement (use multi placement tester if necessary).

7.8 Working width reduction by lifting the outer sowing units on the ED 452-K and ED 602-K with row fertiliser applicator

Lift the outer sowing units. This way the drive for the individual singling discs is disengaged automatically.

Close the shutter slides (Fig. 147/1) of the outer fertiliser coulters.



If the shutter slides of the metering wheels for the outer fertiliser coulters have not been closed, the fertiliser will drop to the ground.



Fig. 147



7.9 Row fertilising in conjunction with the front tank

For the hydraulic star wheel lift utilising ED-control ensure for a hydraulic connection between Airplanter and the lifting ram of the front tank star wheel.

For hints regarding the operation of the front tank, please refer to it's instruction manual.

When using the front tank for fertiliser delivery operate with a blower fan minimum speed of 3500 R.P.M.



When using the hydraulically driven blower fan do not exceed the maximum permissible blower fan speed (max. speed 4000 R.P.M.).



When routing the fertiliser supply pipe and the cable bundles on the side of the tractor ensure for a conducting connection of the cable harness with the tractor earth (danger of static supercharging).



When attaching the fertiliser delivery pipe on the tractor ensure for a horizontal positioning. Ensure that the delivery hoses are not sagging.



The fertiliser metering takes place only via the main seed metering wheels of the front tank metering. (See front tank instruction manual).

Crank turns for the calibration test on the front tank

Working width	3,0 m	4,5 m	6,0 m	9,0 m
1/10 ha	270	180	136	90
1/40 ha	67,5	45	34	22,5
Crank turns on the gearbox				

Fig. 148

8. After having finished work

8.1 Lift the sowing units

Tension leg spring (Fig. 149/1) as illustrated.

Lift the sowing unit at the rear until the pin (Fig. 149/2) catches into the key (Fig. 149/3) by itself.

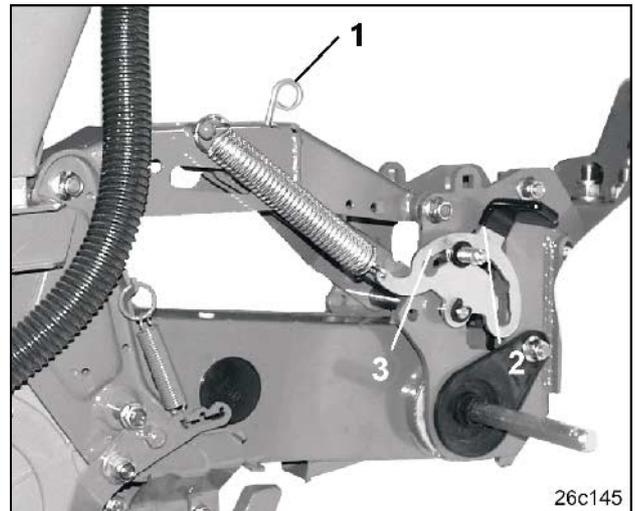


Fig. 149

8.2 Emptying the seed hopper

For an easier emptying of the seed hopper slacken the pin (Fig. 150/2) swivel downwards the pressure roller (Fig. 150/1) (see Fig. 150/3).

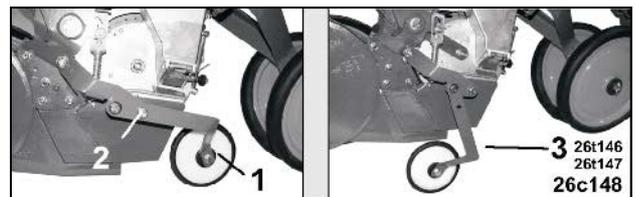


Fig. 150

Open the sprung loaded flap (Fig. 151/1) and empty the seed hoppers.

Empty the seed housings with the aid of the discharge flap (Fig. 151/2). For this slacken the plastic nut (Fig. 151/3) and swivel the fixing spring (Fig. 151/4) to the side.

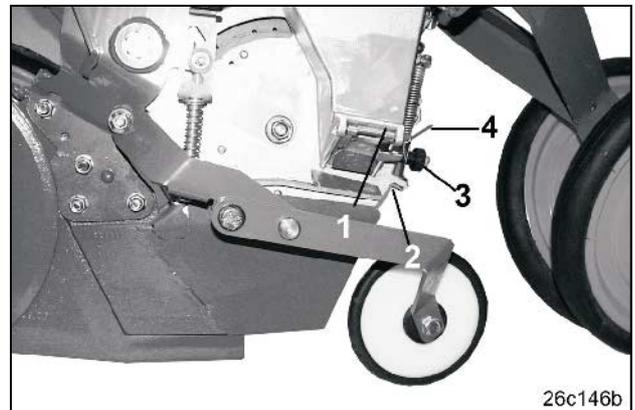


Fig. 151



After emptying shut the two emptying flaps properly.

Ensure the correct fitting of the fixing spring.

After emptying lift the pressure roller (Fig. 150/1) and secure using the pin (Fig. 150/2).

Storing the machine for a prolonged period

- Completely empty the seed hopper to avoid germination of seed residue.
- Open the discharge flaps of the seed housings so that no mice will be trapped in the seed housing. They might nibble on the plastic parts.

8.3 Fertiliser quick emptying device

The quick emptying device of the fertiliser hopper consists of two outlet hoses, fixed to the left hand and right hand side in the fertiliser hopper bottom. With the aid of these hoses, it is very easy to discharge the fertiliser residues inside the fertiliser hopper into a collecting tray placed underneath.

Procedure:

- Place sufficiently large collecting trays underneath the ED.
- Remove securing pins (Fig. 152/1) from the hose fixing plate.
- Pull the hose out of the fixing plate and hold the hose end directly into the collecting tray until no fertiliser is coming out any more.
- Replace the hose into the fixing plate and secure with the securing pin (Fig. 152/1).
- Carefully clean with water the fertiliser hoppers and fertiliser coulters.



Fig. 152

Only for ED 452, ED 452-K and ED 602-K:

Before cleaning with water, briefly drive the blower fan to empty the hoses leading to the outer fertiliser coulters.



Implicitly ensure that no fertiliser residue nor a water/fertiliser mix will remain in the machine.

Drying moist fertiliser will get lumpy which would result in an entire blockage and damage on rotating components when the machine is used the next time.

8.4 Cleaning the implement

The implement can be cleaned with a jet of water or a high pressure cleaner.



In case you blow out the seed hopper by using compressed air, please keep in mind that dressing agent are poisonous. Do not inhale the dust.

Tilt the fertiliser sieves upwards

Tilt the fertiliser sieves (Fig. 153/1) upwards by using the handle and lock with the locking angle (Fig. 153/2).

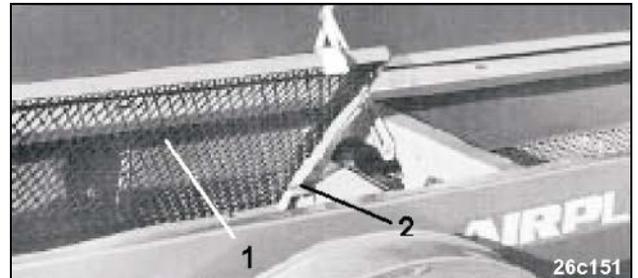


Fig. 153



If necessary, the upwards tilted fertiliser sieves can be removed to the rear.



Never reach with your hands into the fertiliser hopper. Danger of injury from the rotating agitator shaft.

9. Fertiliser filling auger

For an even fertiliser distribution the filling auger is equipped with a two-sectioned settable outlet.

The fertiliser filling auger is driven by the tractors hydraulic system with the aid of the hydraulic motor.

For this required on the tractor side:

- 1 double acting control spool valve or
- 1 single acting control spool valve and 1 pressure less return flow, favourably directly into the oil tank of the tractor (only in conjunction with an electric-hydraulic control unit).

With an auger speed of 400 R.P.M. a good delivery capacity is achieved. For this an oil quantity of approx. 30 l/min. is required from the tractor.

The drive of the filling auger is connected with a hydraulic lowering device. This way a low filling height is achieved.



Fig. 154



On tractors with only one oil circuit, it is not possible to operate the hydraulic motor and the three-point hydraulic simultaneously. For lifting the Air-planter, switch off the hydraulic motor drive.



Tractors with a constant high pressure hydraulic system (e. g. John Deere) are not necessarily suited for the operation of oil motors. Observe the recommendations of the tractor manufacturer and for further information, please contact your dealer, your importer or AMAZONE.



The hydraulic system is under high pressure.

When connecting the hydraulic hoses to the tractor's hydraulics take care that the hydraulics are pressure less on the tractor as well on the implement side.



When connecting hydraulic rams and engines the described connection of the hydraulic hoses has to be noted.

9.1 Operating the filling auger

- Connect the hydraulic hoses on to the tractor.
- Open the block tap on the hydraulic hose for the filling auger.
- Remove the cover (Fig. 155/1) from the filling chute.
- Actuate the control spool valve so that the filling auger is lowered to the filling position (filling height 60 cm).

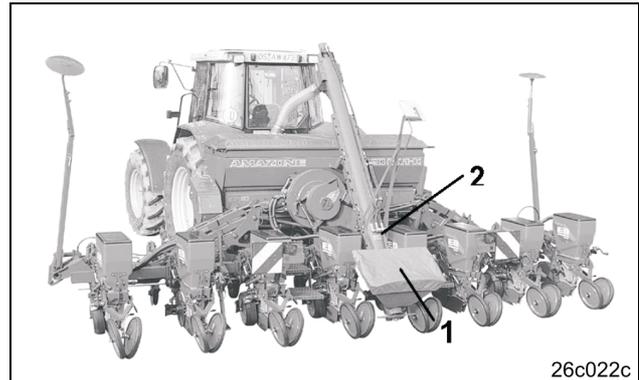


Fig. 155



Danger of squeezing

When actuating the control spool valve no body is allowed to stay within the operational range of the filling auger.

- Back up, e. g. to a trailer.
- Swivel the three-way block tap (Fig. 155/2) whereby the drive of the filling auger is switched on.
- Feed the auger via the chute.



If on machines with a dust-free fertiliser filling the worm auger drive blocks during the filling procedure, the fertiliser hopper is full.

- Empty filling auger completely
- Swivel the three-way block tap (Fig. 155/2) and thus switch off the drive of the filling auger.
- Cover the chute by the hopper cover.
- Actuate the control spool valve so that the filling auger will swivel into the transport position.
- Close the block tap on the hydraulic hose for the filling auger. This way, the lowering device for the filling auger will get locked.

9.2 Maintenance and cleaning

After having finished the operation clean the filling auger with water and apply grease to the dry implement. Procedure:

- Remove the lower bottom (Fig. 156/2)
- Slacken the thumb bolts (Fig. 156/1)
- Turn the bottom part (Fig. 156/2) and remove
- Knock on the feeding tube. The fertiliser residue will fall out.



Fig. 156

If necessary, the worm auger (Fig. 156/3) can be taken out for cleaning.

- Remove the split pin (Fig. 157/1) on the hydraulic motor.
- Pull out the worm auger in downward direction.



Before carrying out any maintenance work, switch off the tractor and remove the ignition key.



Fig. 157

10. Special options

10.1 Singling discs

10.1.1 Singling discs for the sowing units Classic and Contour

			Order-No.
30/5	green	maize	910 777
30/5,8	natural	maize with high TGW and high forward speeds	910 790
45/6	red	field beans	910 792
60/5	dark grey	beans and peas	924 211
60/4	orange	soy beans	924 212
60/2,5	black	small beans	910 795
30/2,5	brown	sunflower	924 213
60/3,2	light green	cotton	915 763
60/2,2	burgundy red	Sorghum	918 477
15/2,5	pink	sunflower (for grain spacings larger than 22 cm)	917232

Fig. 159

10.1.2 Singling discs for Contour-sowing units

			Order-No.
30/2,2	blue	prilled sugar beet	918 860
15/2,2	turquoise	prilled sugar beets	920 048
30/1,8	yellow	water melons and bare beet	920 049
60/1,4	fawn coloured	Brachiara	920 050
90/1,2	white	rape	920 051

Fig. 158

10.2 Sowing coulters for beans

This sowing coulters is recommended for a seed placement deeper than 7 cm.

With the bean sowing coulters the seed can be placed with a larger depth into the seed bed. The placement depth is infinitely variable from 0 to 12 cm.

10.3 Switching unit for ED 452-K und ED 602-K

For linking boom folding and track marker actuation

- Unlock track markers from the transport position. (only ED 452-K).
- Move switching lever (Fig. 160/1) into Position "A" and fold out or in the outer sowing units.
- Hold the lever on the control unit of the tractor in position "Lifting" or "Lowering" until the sowing units have been completely folded in or out.
- Move switching lever (Fig. 160/1) into Position "B". Change the marking sides of the track markers by actuating on the control unit of the tractor.

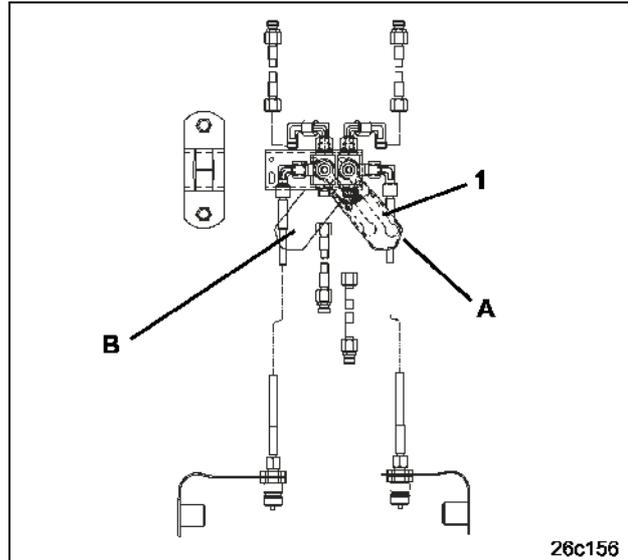


Fig. 160

10.4 Parking support for ED 902-K

For ED 902-K available is an especially designed parking support (Fig. 161) with which the machine can also be parked when it is folded in.

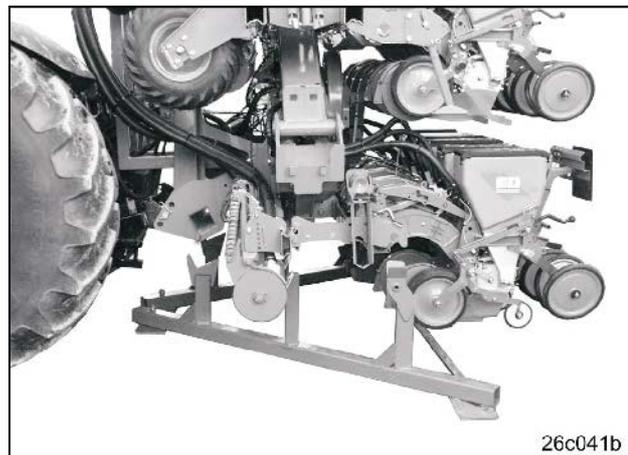


Fig. 161

10.5 Stone- and clod clearer

10.5.1 Clod clearer for classic sowing unit

When the clod clearer (Fig. 162) is retrofitted,

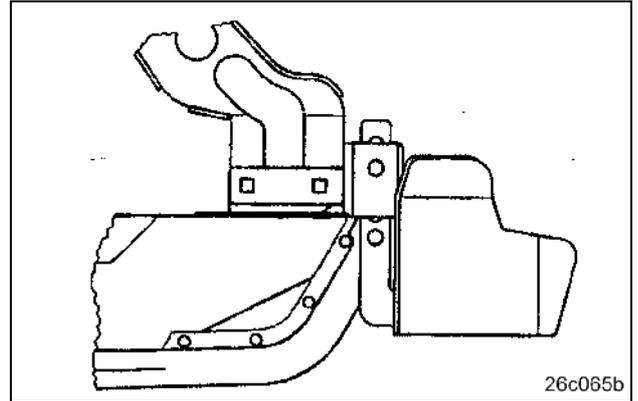


Fig. 162

shorten the coulter point according to Fig. 163.

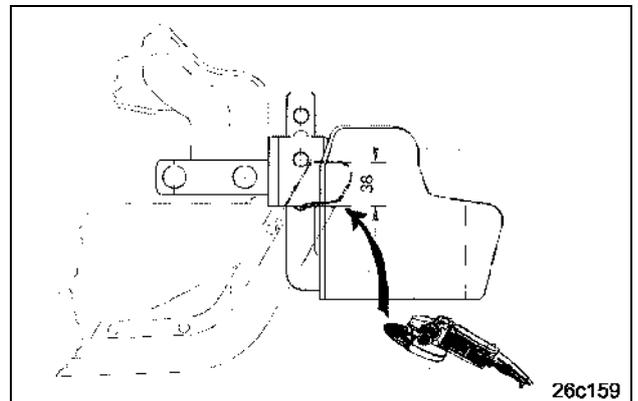


Fig. 163

10.5.2 Stone clearer for Classic-sowing unit

Not for foldable implements (Fig. 164).

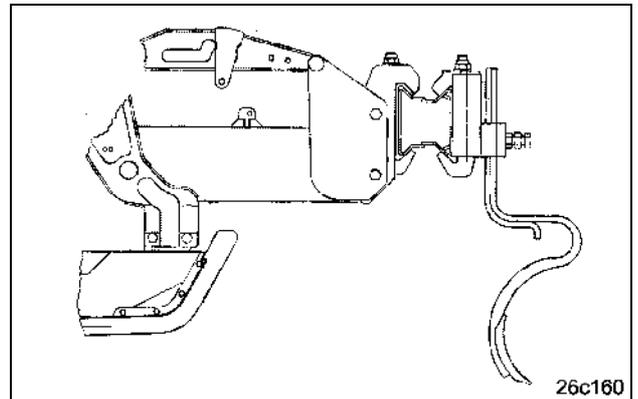


Fig. 164

10.5.3 Clod clearer for Contour-sowing units

Clod clearer (Fig. 165) for Contour-sowing units

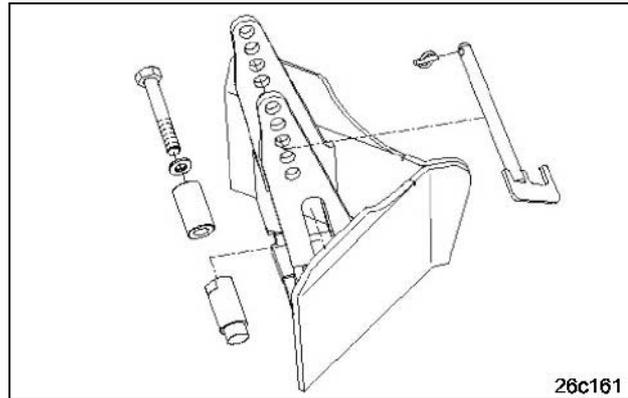


Fig. 165

10.5.4 Stone and clod clearer for contour sowing units

Stone and clod clearer (Fig. 166) for contour sowing units.

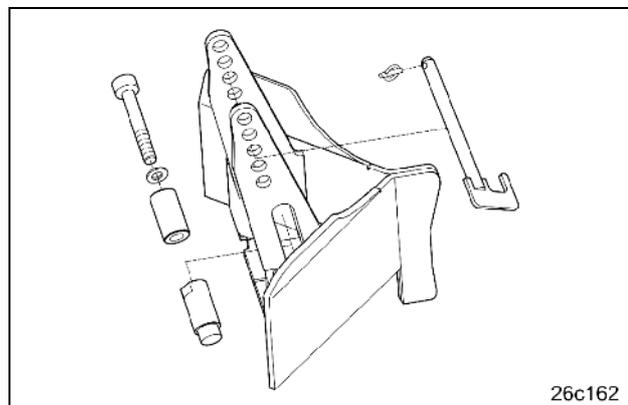


Fig. 166

10.6 Vertical marker arm folding, hydraulically actuated

The vertical marker arm folding (Fig. 167) serves simultaneously

- for folding the marker arms into a vertical position and
- for switching over the track marker on the field end.

Due to the wide protrusion of the marker arms the Airplanter has a large implement width. By folding the marker arms into a vertical position the implement width can be reduced in a few moments. This way, obstacles can be negotiated in a simple way without the tractor operator leaving the tractor cab.

Connect the hydraulic hose of the switching unit for the marker arm folding to a single acting control spool valve of the tractor.

Changing the track marker

- Before turning at the headlands set the control spool valve of the tractor on "lifting" ("Heben").
- Then both track marker arms are folded upwards when turning at the headlands.
- After having turned at the headlands set the control-spool valve into the position "lowering" "Senken". Then the earlier not used track marker disc will automatically be lowered.

When folded down the working width of the track markers can be set on the marker arm tube with the aid of a chain.

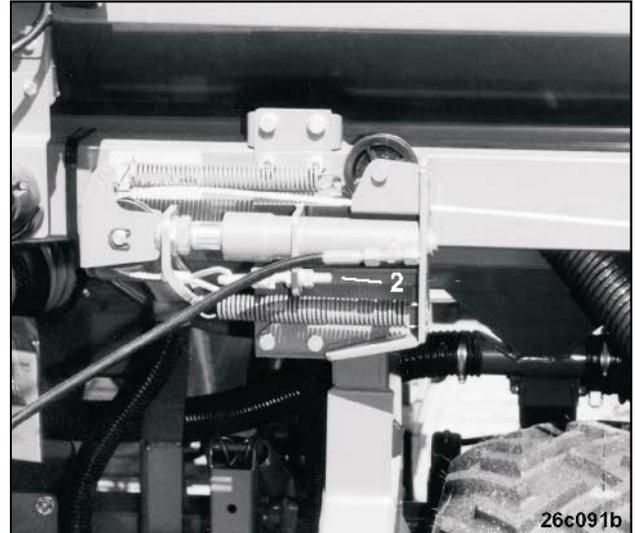


Fig. 167



Danger of squeezing

While actuating the marker change over staying or working in the operational range of the marker change over or the track marker arms is prohibited. Danger of injury from moving parts.

10.7 Hydraulic blower fan drive

Required on the tractor for the hydraulic blower fan drive

- 1 double acting control spool valve or
- 1 single acting control spool valve and 1 pressure free return flow, favourably directly into the oil tank of the tractor.

The maximum oil quantity required by the hydraulic ram is approx. 22 l/min.

Mount the hydraulic motor (Fig. 168/1) onto the blower fan input shaft.

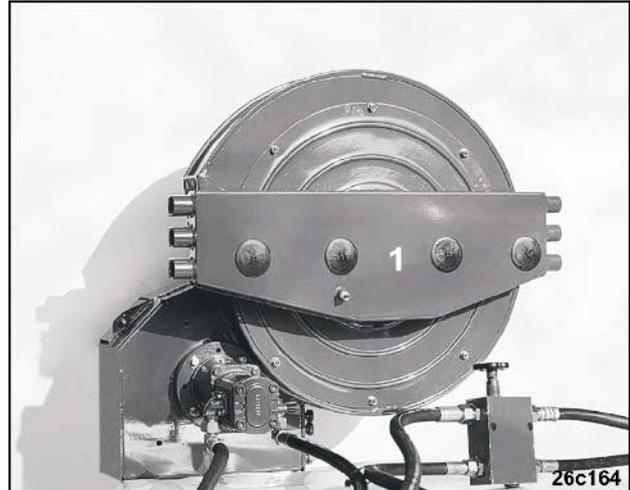


Fig. 168



The hydraulic blower fan is only suited for tractors with a Load-Sensing-System or a separate oil circuit. Only by such tractors the implement can be lifted with the aid of the three-point hydraulic at the headlands without disengaging the blower fan drive.



The as standard supplied V-belt pulley (drive for PTO shaft with 1000 R.P.M.) must be fitted onto the input shaft of the counter gearbox for the blower fan.

Set the required vacuum

The vacuum depends on

- the blower fan drive speed, which is set by turning the hand wheel (Fig. 169/1) on the pressure valve.
- the kind of seed and the singling discs used
- the number of the sowing units.

Procedure for setting the required vacuum

- Fill all sowing units with seed
- Raise the implement
- Switch on the blower fan
- Turn the drive wheel with the aid of the calibration crank until all naps of the singling discs are covered with seed grains.

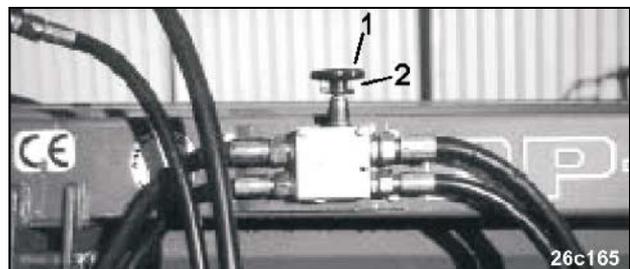


Fig. 169

- Turn the hand wheel (Fig. 169/1) until the pointer (Fig. 170/1) of the pressure gauge (Fig. 170/2) has reached the green area (Fig. 170/3)
- Secure this hand-wheel setting with the aid of the counter nut (Fig. 170/2).



In case of changing the kind of seed and/or the singling discs or when the number of sowing unit is changed, check the vacuum and readjust, if necessary.

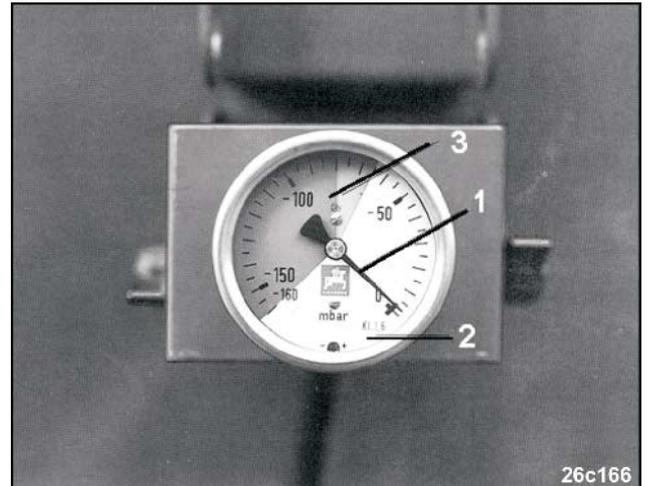


Fig. 170

10.8 Sprung track mark eradicators

The task of the track mark eradicator (Fig. 171/1) is less the eradication work but mainly the closing of the tractors' wheel marks.

For ED 302 and ED 452 mount the track markers on the main frame (Fig. 171/2) of the Airplanter in such a way that they work in the loose soil about 5 cm a-side the right and left hand tractor track and close the tractor track. This way, the best levelling of the tractor track is achieved.



Fig. 171

10.9 Sprung track mark eradicators for ED 902-K

Sprung track mark eradicators (Fig. 172) in heavy duty execution for ED 902-K.

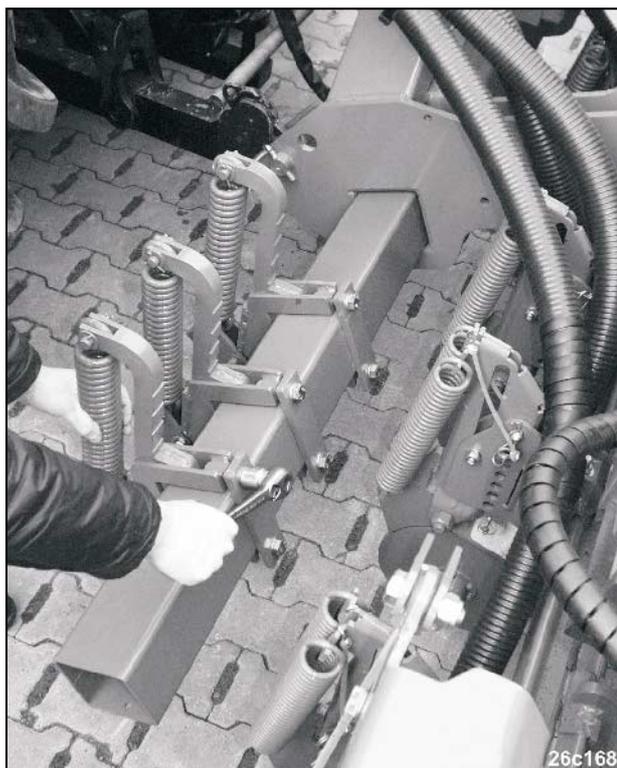


Fig. 172

10.10 Terra-tyres 31 x 15,5/15

The Terra-tyre is especially suited for light soils as it distributes the implement weight to a large contact surface.

Recommended tyre pressure 1,2 bar.

10.11 Loading board for fertiliser filling

At row spacings larger than 75 cm the loading board (Fig. 173/1) can be mounted at the rear of the Airplanter to facilitate the filling of the fertiliser hopper.



The loading board may only be used for filling the machine. Travelling on the loading board during transport is prohibited.



Fig. 173

10.12 Precision Airplanters in combination with PTO driven soil tillage implements

When it is intended to operate an ED 02 in combination with a rotary cultivator or a rotary harrow, please note:

- on the soil tillage implement a rear PTO shaft connection is required.
- The speed of the rear PTO shaft connection must coincide with the blower fan speed of the ED (540 R.P.M., 710 R.P.M. oder 1000 R.P.M.)
- To reduce the lift power requirement we recommend to use the lift frame (AMAZONE-System "Liftpack" Fig. 174/1) with which the precision Airplanter is lifted above the packer roller when the entire combination is raised (at the headlands).

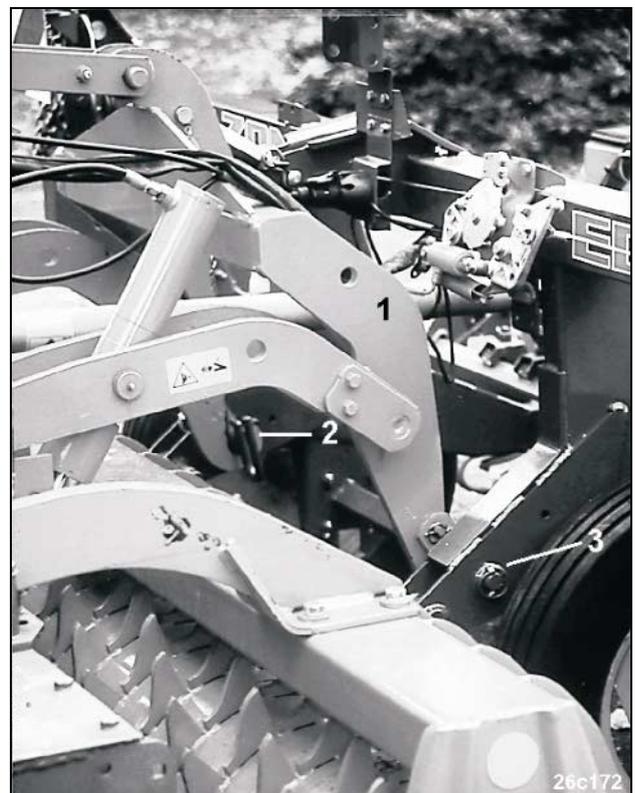


Fig. 174

11. Maintenance and repair



When carrying out maintenance-, repair- and cleaning work on your implement, please observe para "General safety and accident prevention advice".



Thoroughly clean the implement before storing for a prolonged period. Fertiliser residue will result in an increased corrosion.

11.1 Bolted connections



Check all bolted connections on the implement after the first 2 hours of operation and then every 100 hours of operation, retighten if necessary.

11.2 PTO shaft

Before starting operation and then every 8 hours of operation grease the PTO shaft (Fig. 175) with a trade marked grease.

Clean and grease the PTO shaft before any prolonged period of storing.

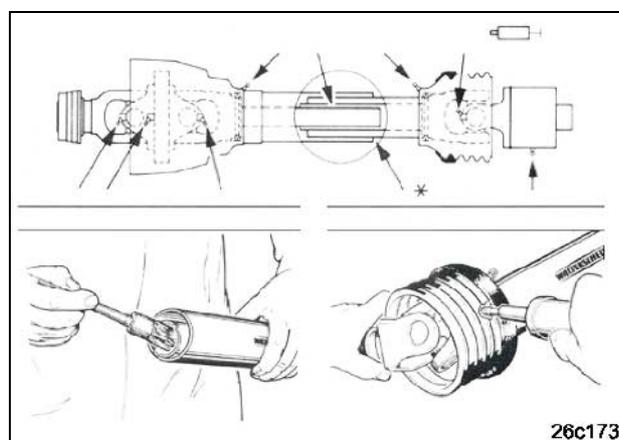


Fig. 175

11.2.1 Hinges on the ED 452-K / ED 602-K

Grease the grease nipples of the parallelogram guide rod (Fig. 176/1) (4 pcs. per parallelogram guide rod) according to the actuation frequency, however, at the latest after 50 hours of operation.



Fig. 176

11.2.2 Hinges on the ED 902-K

Grease the grease nipples of the folding cylinder (Fig. 177/1 und Fig. 177/4) as well as for the actuating scissors (Fig. 177/3 and Fig. 177/2) according to the actuation frequency, however, at the latest after 50 hours of operation.

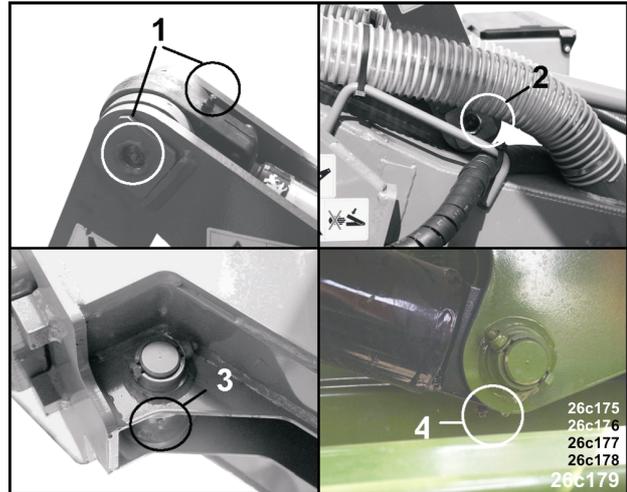


Fig. 177

11.2.2.1 Main pivoting points of arms

Regularly grease the grease nipples on the main pivoting points for the arms (Fig. 178/1 and Fig. 178/2).

2 grease nipple per arm.



Fig. 178

11.2.2.2 Track markers

Regularly grease the grease nipples on the track markers (Fig. 179).



Fig. 179

11.3 Ribbed V-belt for blower fan drive

The proper re-tensioning of the ribbed V-belt (Fig. 180/1) is of decisive importance for its life span. The switching-on behaviour of the tractor PTO shaft influences mainly the lengthening of the V-belt.



The slow engagement of the tractor PTO shaft increases the life span of the ribbed V-belt.

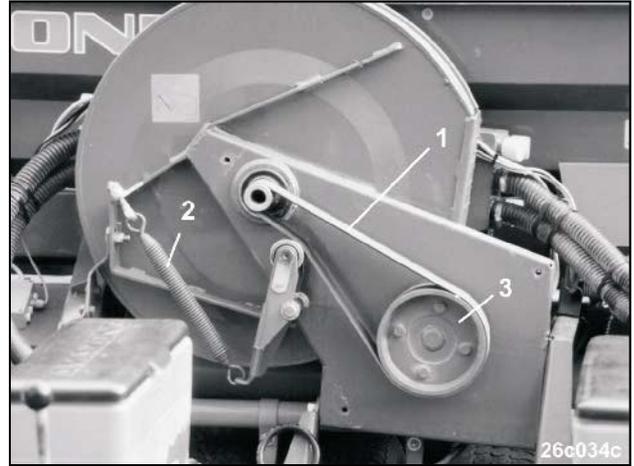


Fig. 180



The belt-pre-tensioning depends on the spring length of the tensioning spring (Fig. 180/2). The prescribed spring length depends on the diameter of the V-belt pulley (Fig. 180/3) and can be read off the sticker on the guard box or the table (para. "V-belt pulleys for different PTO shaft speeds").



A correct V-belt tensioning reduces an early wear.

Re-tension the ribbed V-belt as follows:

- Slacken both counter nuts (Fig. 181/1) (Fig. 181/2). Set the tensioning spring length according to the table in para: "V-belt pulleys for different PTO shaft speeds".
- Retighten counter nuts (Fig. 181/1) .



For the first time check the V-belt after 10 hours of operation and later on in intervals of 50 operational hours. Re-tension if necessary.



Fig. 181

For checking the ribbed V-belt

- Remove the guard and check the V-belt for wear.



Properly fit the guard again.

11.4 Hydraulic track width adjustment on the ED ED 602-K



Clean and apply oil to the hydraulic track width adjustment before prolonged storing periods (after the season).

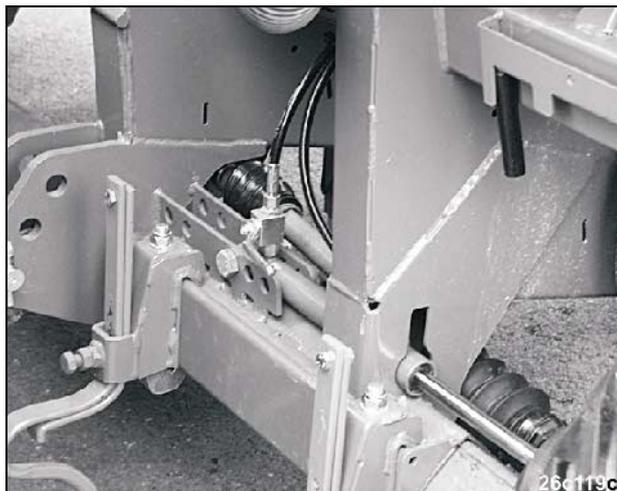


Fig. 182

11.5 Tyre pressure

For tyre air pressure, please refer to table Fig. 183.

When exchanging tyres ensure that the relevant tyre diameter is maintained as otherwise the ratio would change.



Regularly check the tyre pressure of the tyres.

Tyres	Air pressure
Tyres 6.00-16	1,2 bar
Tyres 10.0/75-15	1,2 bar
Tyres 26 X 12.00/12	1,2 bar
Terra-tyres (special option)	1,2 bar

Fig. 183

11.6 Chain drive

The chain drives of the ED 302, ED 452, ED 452-K, ED 602 and ED 602-K are equipped with roller chains.



Before prolonged storing periods remove the roller chains, wash in petroleum and dip into heated grease or oil. Do not oil the chain during operation.



Check the chain drives after the first 10 hours of operation and then in intervals of 100 operational hours. Re-tension if necessary. In case a re-tensioning will be of no use any more, shorten the chains accordingly.

11.6.1 Drive chain of the setting gearbox

The drive chain (Fig. 184/1) connects the shaft of the running wheels with the gearbox input shaft.

The chain is tensioned with the aid of a sprung loaded chain tensioner. For checking the chain tensioning, remove the guard.



This chain and its locking link features a reinforced execution with increased breaking strength. When replacing the locking link or the complete chain, only use original AMAZONE spare parts.

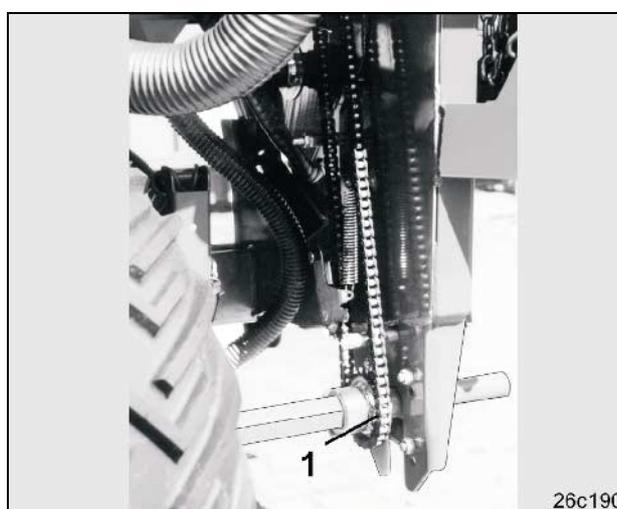


Fig. 184

11.6.2 Reversing chain of the setting gearbox

The reversing chain (Fig. 185/1) on the setting gearbox is tensioned with the aid of a sprung loaded chain tensioner (Fig. 185/2).



This chain and its locking link features a reinforced execution with increased breaking strength. When replacing the locking link or the complete chain, only use original AMAZONE spare parts.

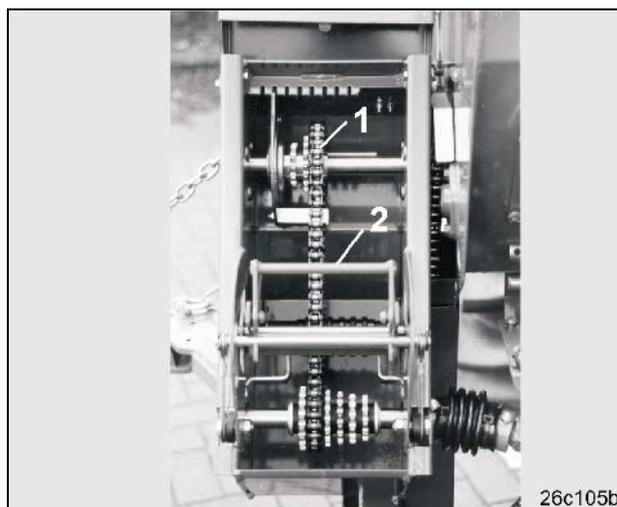


Fig. 185



When re-installing earlier removed guide rollers (Fig. 186/1) of the chain tensioning unit, ensure that the guides (Fig. 186/2) of the guide rollers are in alignment with the chain sprockets of the output shaft (Fig. 186/3).

To achieve an accurate alignment the position of the guide rollers can be re-arranged by using equalising discs on the chain tensioning unit.

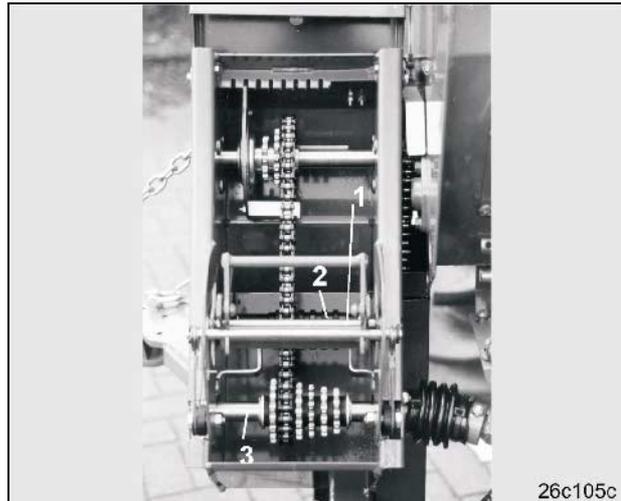


Fig. 186

11.6.3 Drive chain of the sowing units

The drive chain (Fig. 187/1) of the sowing units connects the PTO shaft on the gearbox output of the secondary gear (Fig. 187/2) with the seed shaft (hexagon shaft).

This chain is tensioned with the aid of a sprung loaded chain tensioner.



This chain and its locking link features a reinforced execution with increased breaking strength. When replacing the locking link or the complete chain, only use original AMAZONE spare parts.

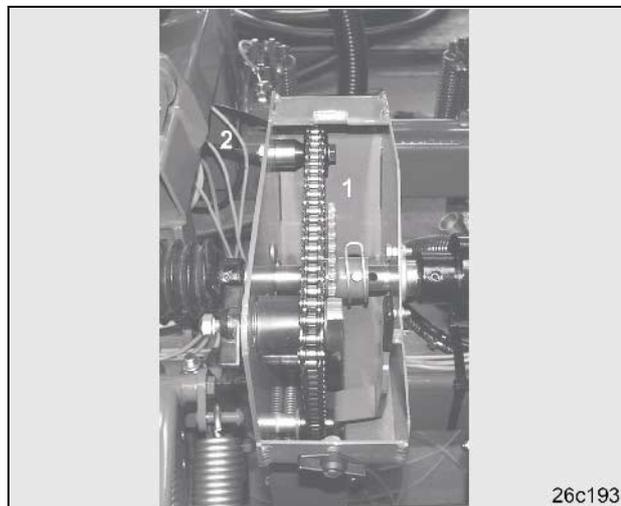


Fig. 187

11.6.4 Drive chain from row fertiliser applicator to ED 302, ED 452 and ED 452-K

The drive chain (Fig. 188/1) of ED 302, ED 452 and ED 452-K with row fertiliser applicator connects the shaft (Fig. 188/2) of the drive wheels with the setting gearbox for the fertiliser application rate.

This chain is equipped with a sprung loaded chain tensioner. For checking the chain tensioning, remove the chain guard. If the chain has lengthened to such an extent that the chain tensioner is of no use any more, shorten the chain as necessary.

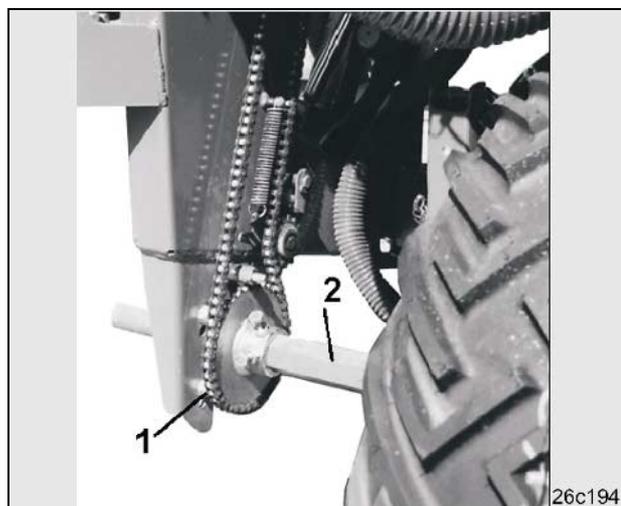


Fig. 188

11.6.5 Drive chain ED 602-K

11.6.5.1 Drive chain 1

A Drive chain 1 (Fig. 189/1) from the output shaft (Fig. 189/2) of the left hand drive wheel to the of the left hand drive wheel to the (Fig. 189/3).

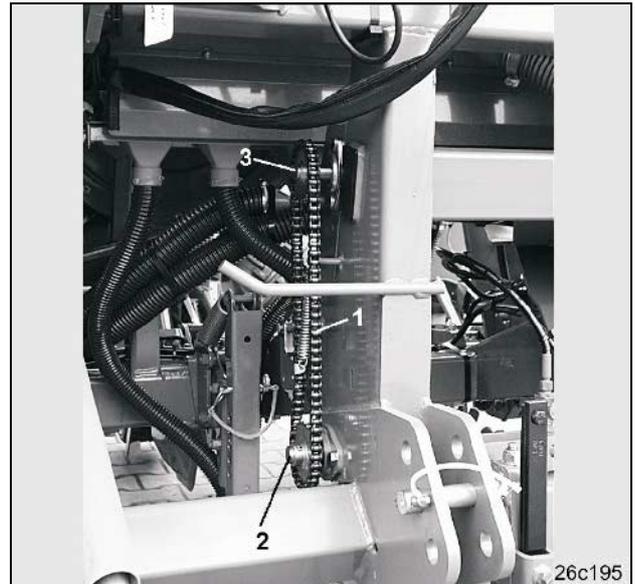


Fig. 189

11.6.5.2 Drive chain 2

Drive chain 2 (Fig. 190/1) from the intermediate shaft (Fig. 189/3) to the setting gearbox (Fig. 190/2) for setting the row spacings.



Fig. 190

11.6.5.3 Drive chain 3

Drive chain 3 (Fig. 191/1) from the output shaft (Fig. 191/2) of the right hand drive wheel to the intermediate shaft (Fig. 192/2).

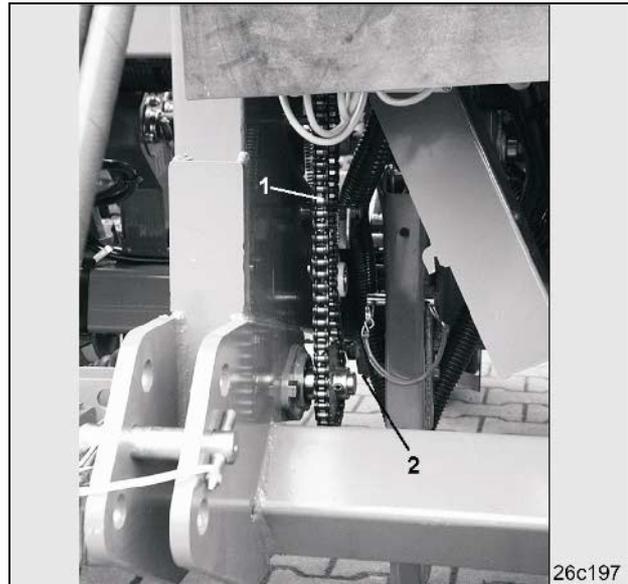


Fig. 191

11.6.5.4 Drive chain 4

Drive chain 4 (Fig. 192/1) Drive chain (Fig. 192/2) to the oil bath gearbox (Fig. 192/3) for setting the fertiliser application rate.

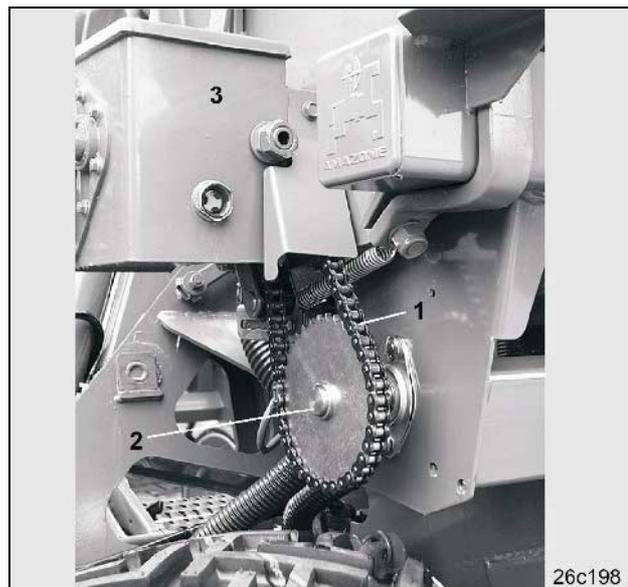


Fig. 192

11.6.6 Drive chain ED 902-K

Drive chain (Fig. 193/1) from the drive wheel to the setting gearbox.



Fig. 193

11.7 Singling discs and suction kidneys

The singling discs (Fig. 194/1) and suction kidneys (Fig. 194/2) and the seed housings (Fig. 194/3) consist of high grade plastic materials.

The suction kidney serves as sealing between the singling disc and the suction lid (Fig. 194/4), the housing gasket as sealing between the singling disc and the seed housing.

The PE-foam profile sealing (Fig. 194/5) represents the coarse sealing of the seed housing and prevents the penetration of sand. This sealing must not show any worn areas. Repair kits are available for the PE foam profile-sealing.

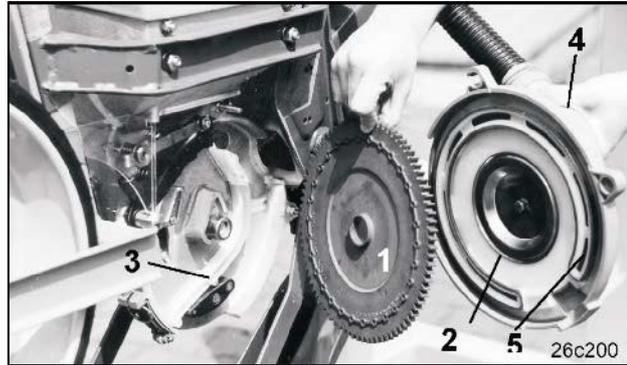


Fig. 194



Singling discs, suction kidneys, seed housing sealing and PE-foam profile sealing suffer from a natural wear.

Depending on the individual operational conditions, grooves in the singling discs will result.



If these grooves have a depth of 1.5 to 2 mm, replace the singling discs, as then no proper sealing is ensured any longer.

Also replace damaged seed housing sealing (Fig. 194/3).



To guarantee a proper function of the singling discs, check the singling unit every 50 hours of operation.

11.8 Ejector



If the sprung loaded ejector (Fig. 195/1) shows heavy signs of wear, so that the ejector body itself is wearing off, replace the ejector.

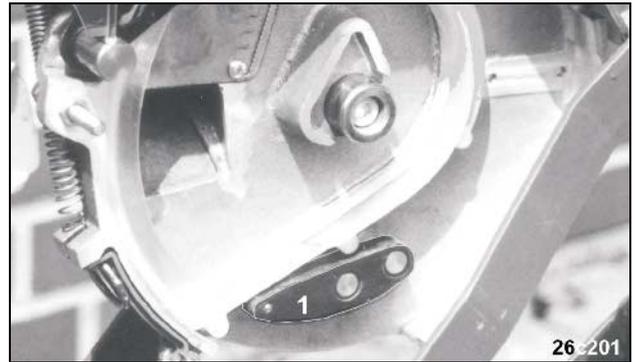


Fig. 195

11.9 Oil level inside the infinitely variable setting gearbox

Check the oil level on the oil gauge (Fig. 196/1) of the setting gearbox. The oil quantity is sufficient if the oil level reaches up to the mark.



An oil exchange is not necessary.

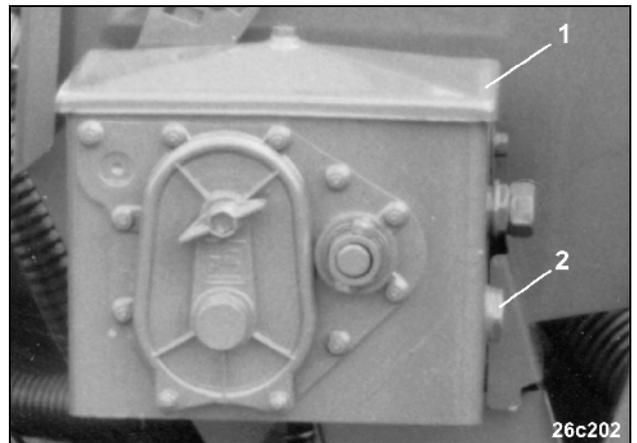


Fig. 196

In case of a lack of oil unbolt the cover (Fig. 196/2) and top up with hydraulic oil WTL 16,5 cSt/50°C or motor oil SAE 10 W.

The filling quantity is 1,8 l.

11.10 Exchange of coulter points on the sowing- and drag fertilising coulters

The depth placement accuracy directly depends on the condition of the coulters. Only sharp and V-shaped coulter points will shape a seed furrow which prevents the maize cobs from rolling about.

The coulter points of the Classic (Fig. 197/1) or



Fig. 197

Contour (Fig. 198/1) coulters are exchange points made from hard alloy cast iron.

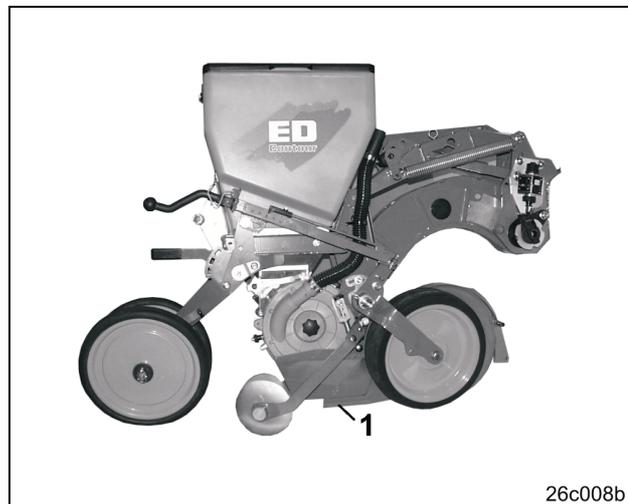


Fig. 198

Exchange of hard alloy points on the sowing coulters

In case of worn exchange hart alloy points replace them by new ones as follows:

- Slacken the bolt connections (Fig. 199/1)
- Replace the hard alloy cast iron point by a new one and re-bolt.

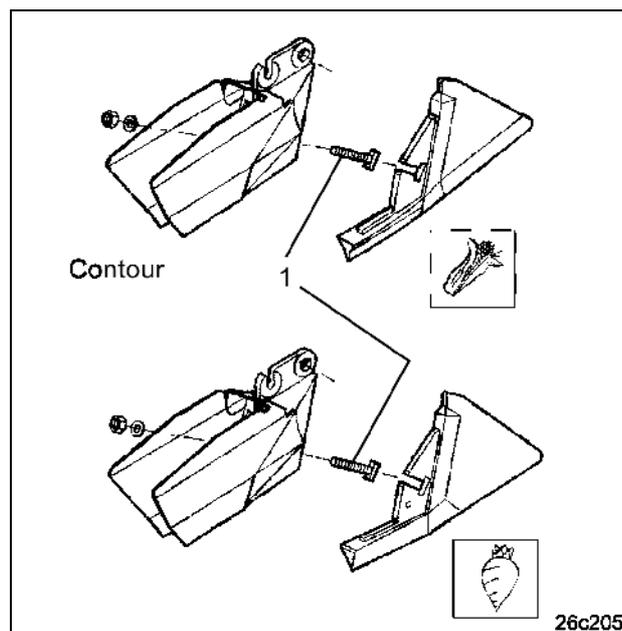


Fig. 199

Exchange of the hard alloy cast iron points on the drag fertilising coulters:

In case of wear the fertiliser coulters points can be exchanged or turned.

- Slacken bolted connection (Fig. 200/1)
- Turn hard alloy cast iron point or replace by a new one and fix with rivets again.

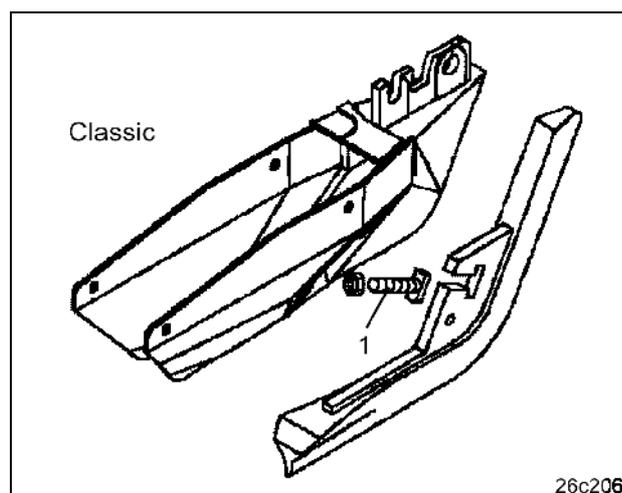


Fig. 200



Check the sowing- and fertiliser coulters for wear every 50 hours of operation. Replace or turn the exchange hard alloy cast iron points before the side plates of the sowing- and fertiliser coulters will show any signs of wear.

11.11 Cleaning the suction air blower fan rotor

The sucking of dressing agents may result in a residue of these dressing agents on the suction air blower fan rotor.

This residue may result in an uneven run of the blower fan rotor.

In case of an uneven blower fan run, drive the blower fan and lead a jet of water into a free suction opening of the blower fan. This way, residues on the blower fan rotor are removed.



Water will be thrown out of the blower fan opening.

Protect your eyes with safety glasses.

11.12 Table for maintenance

Component parts	Maintenance intervals [h]						
	first maintenance after			further maintenance after			
	2	10	50	8	25	50	100
Bolted connections							
PTO shaft							
Hinges ED 452-K ED 602-K ED 902-K							
Ribbed V-belts							
Hydr. track width adjustment ED 602-K							
Chain drive							
Singling discs and PE-foam profile sealing							
Suction kidneys							
Coulter points on sowing and fertilising coulter							
Grease bearings of drive shafts							



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