

Instruction manual

AMAZONE Pack Top Seed Drill AD-P 03 SPECIAL



MG 831
DB 2013 GB 10.02
Printed in Germany



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



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H. Dreyer GmbH & Co. KG
D-49202 Hasbergen-Gaste / Germany

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The Pack Top seed drill AD-P 03 Special is yet another product from the large range of farm machinery produced by AMAZONEN-Werke, H. Dreyer GmbH & Co. KG.

In order to ensure that you obtain trouble-free operation, we recommend that you carefully read and observe the information within this instruction manual and to adhere to the advice given therein.

Please ensure that this instruction manual is made available to any operator before he or she starts to operate the machine.

This instruction manual refers only to the Pack Top seed drills AD-P 03 Special.

We wish you every success with the operation of your new seed drill and obtain the best results..

AMAZONEN-Werke
H. Dreyer GmbH & Co. KG

Hits for this instruction manual

Keep this instruction manual so that it is always to hand. Also in the event of sale pass on the manual to the next owner.

At the time of printing all data and information is correct, however AMAZONE always endeavours to introduce improvements. We therefore reserve the right to make changes to and/or alter the specification to our products without any liability.

Symbols in this instruction manual

In this instruction manual many warning and precautionary hints are given by the use of symbols (see below).



The warning symbols in this instruction manual indicate dangerous points on the machine. Observing these symbols means safety for all persons using this machine (Warning symbol according to DIN 4844-W9) .



Attention symbol

This symbol refers to safety advice. Not adhering to this safety advice implies danger to the implement and its functions.



Hint symbol

Hints regarding the machine's specification which have to be followed in order to obtain faultless function of the machine are identified with the hint symbol.

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2.0 Details about the machine

2.1 Operational range

In combination with a soil tillage implement, the Pack Top Seed Drill is suited for storing, metering and sowing of all commercially available seeds.

2.2 Manufacturer

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

2.3 Conformity declaration

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

2.4 Details when making enquiries and ordering

When ordering options or spare parts the machine type and the serial number have to be included.

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 you only to use original spare parts and original options.

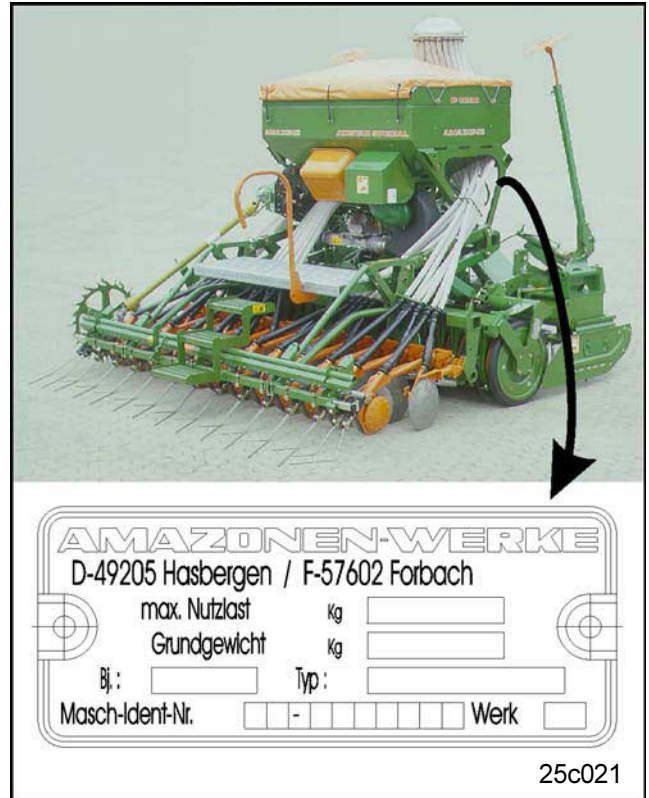
Original spare parts and options have been especially designed for your machine and have been checked.

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.

2.5 Type plate



The type plate is of documentary value and may not be changed or disguised.



Insert here the machine type and serial number of your Pack Top Seed Drill.

Machine type:
AMAZONE
Pack Top seed drill

AD-P Special

Serial-No.:

2.6 Technical data

	AD-P 303 Special
Coulter exchange module	WS(Suffolk)-coulters or RoTeC(roll disc) coulters
Number of rows	24
Row spacing	12,5 cm
Working width = Transport width	3,0 m
Height	
up to upper edge of seed box w.o. extension	2,0 m
up to upper edge distributor head	2,79 m
Weight (without soil tillage implement and without roller)	ca. 790 kg
Capacity seed box without extension	750 l
Capacity seed box with extension	1000 l

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Seed box, metering unit, distributor head and blower fan of the AD-P Special are fixed to the AMAZONE soil tillage implement with the aid of a coupling frame. The coulter frame rests on the strong roller.

On AMAZONE combinations the seed placement depth remains the same even if the working depth of the soil tillage implement is changed.

When using a soil tillage implement of another manufacturer the coulter frame of the AD-P Special is firmly fixed to the soil tillage implement. Therefore the placement depth of the seed must be checked and re-set at every working depth adjustment of the soil tillage implement.

A star wheel drives the sowing units.

The translucent distributor head being fixed on the seed drill within sight of the operator distributes the seed evenly to all coulters. This distributor head position allows the operator a permanent monitoring of the seed flow.

2.7 On receipt of the machine

When receiving the machine, please check immediately that no damage has been caused in transit and all parts are present. Only the immediate reportage of damage will be considered for compensation. Please check whether all parts mentioned on the delivery note are present.



Fig. 2.1

2.8 AMAZONE WS (Suffolk)-coulters

The AMAZONE WS-coulter (Fig. 2.2) is equipped with an exchangeable coulters tip (Fig. 2.2/1) made from cast iron. Due to its high wear resistance, cast iron is a proven coulters tip material. However, wear cannot be avoided during large area operation on aggressive, sandy and sharp edged soils. Worn coulters tips can be exchanged.

The coulters support (Fig. 2.2/2) prevents blockage of the coulters outlet when the machine is lowered onto soft soil. During operation the coulters support swivels backwards. Hardly any wear can be observed on the coulters support. Never the less, the coulters support can easily be exchanged.

The coulters unit contains a guide hopper (Fig. 2.2/3), which guides the seed directly behind the coulters tip. The seed placement is direct and accurate before the furrow is closed. Only in this way, an accurate and even depth of seed placement is achieved.

Especially in conjunction with a wedge ring roller (Fig. 2.3/A) that is running ahead of the WS-coulter, this provides – when operating behind the plough – even drilling depth and accurate placement of the seed onto a highly recompacted soil strip with a furrow covered by loose, coarse structured soil, see Fig. 2.3:

- 1 = loose, open soil
- 2 = medium recompaction
- 3 = high recompaction

This procedure also considerably reduces the likely hood of blockage during mulch sowing because the dragging coulters hardly rake up any straw or other organic matter in the furrow.

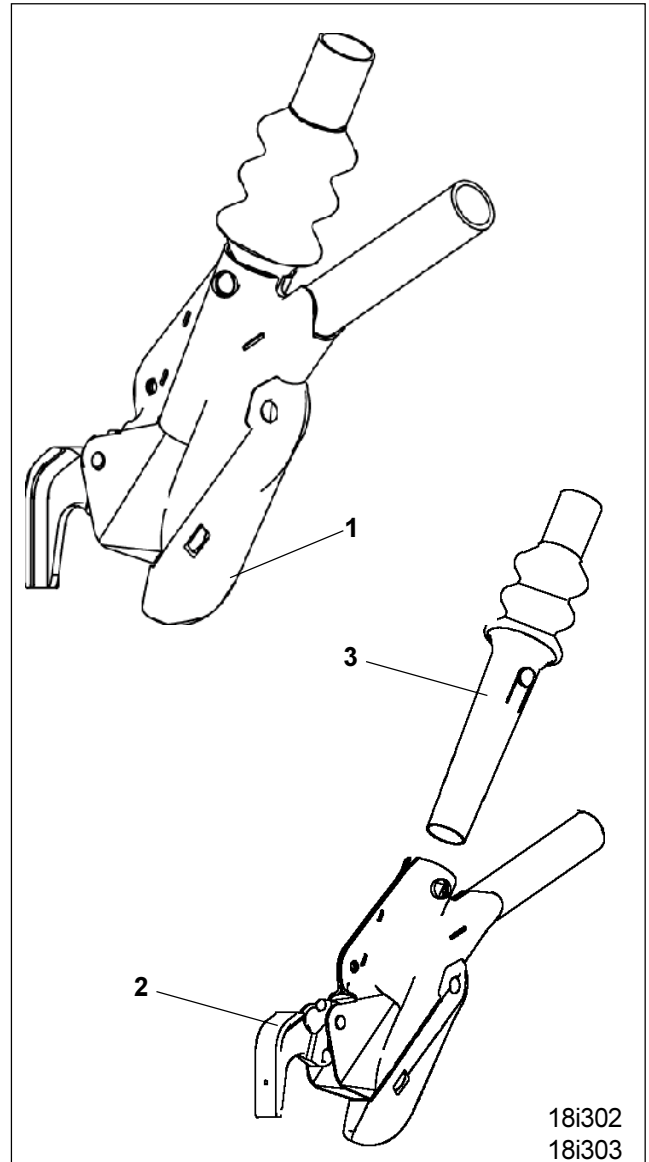


Fig. 2.2

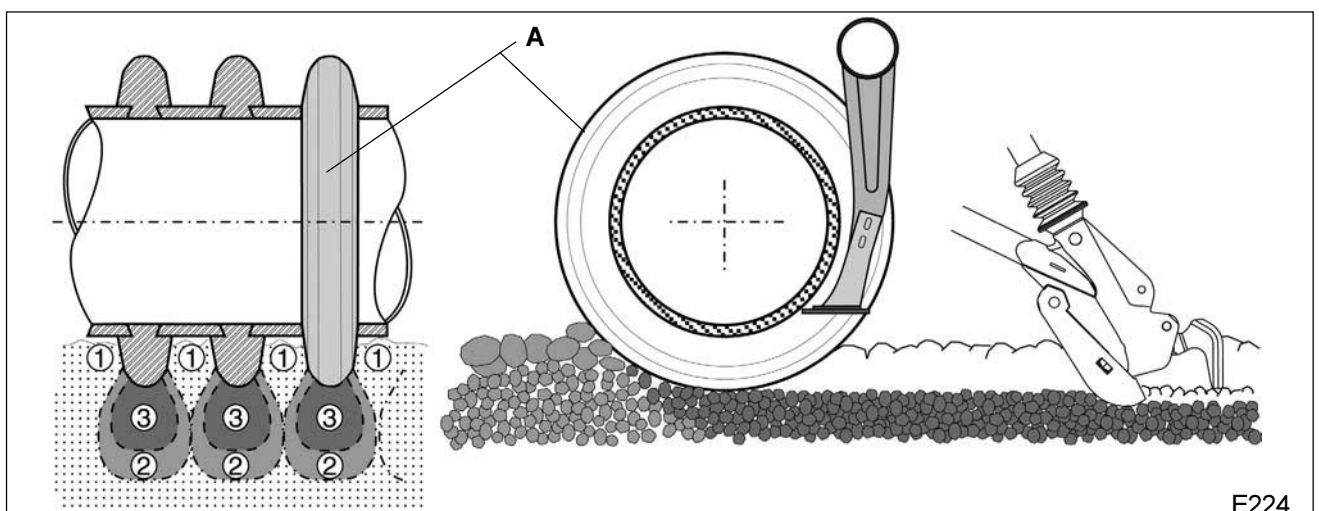


Fig. 2.3

2.9 AMAZONE-sabre coulter tip (Option)

The shallow angle of the AMAZONE sabre coulter tip (Fig. 2.4/1) allows a better straw passage. The larger surface of the coulter reduces the penetrating depth.

That is why the sabre coulter tip can be used for a blockage-free mulch sowing in well mixed straw. The performance of the sabre coulter tip is improved by using the wedge ring roller which pre-forms the seed furrows and thus the deep penetration of the coulter tip into the soil is not required any more.

Sabre coulter tips are also used on light soils which previously required depth limiters for seed placement depth reduction.

Replacing WS-coulter tips (Fig. 2.4/2) by sabre coulter tips is very easily possible (see Fig. 2.4).

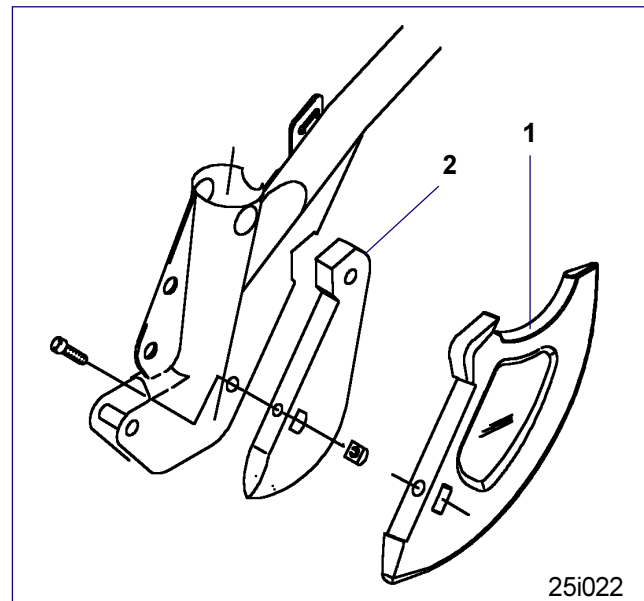


Fig. 2.4

2.10 AMAZONE RoTeC-coulter

The AMAZONE RoTeC-coulter (Fig. 2.5) optimises the sowing accuracy, area efficiency, and life time when sowing after the plough and mulch sowing.

The steel disc (Fig. 2.5/1) is off set by only 7° as seen in the driven direction so that even at high forward speeds only a little soil is moved.

The seed furrow has almost got a rectangular profile which is formed by the steel disc and the cast iron unit. In this way, a solid seed furrow is achieved which ensures an accurate seed placement depth. Due to the small angle of attack hardly any soil sticks to the side of the disc, even on sticky soils. The flexible polyurethane (PU) disc (Fig. 2.5/2) which is attached to the steel disc carefully cleans the back of the disc. The moulded lugs (Fig. 2.5/3) of the PU disc provide additional drive.

The PU-disc (Fig. 2.5/2) is also used as a depth limiting roller as it rolls on the soil and limits the penetration depth of the steel disc into the soil. This penetration depth can be set by means of a grip handle in three steps from 2 to 4 cm (Fig. 2.6, Item 1-3).

For deep sowing greater than 4 cm (Fig. 2.6, Item 4) the depth limiting disc can be removed without tools.

The high coulter pressure up to a maximum of 30 kg provides excellent control over seeding depth, combined with the PU-disc, ensuring an accurate seed placement. The cast iron shoe allows smooth coulter running with an especially even depth placement..

The PU-disc is free from wear. The non corrosive steel disc and the cast iron unit have a long life span.

The MAZONE-RoTeC-coulter is suitable for sowing after the plough and for blockage-free mulch sowing.

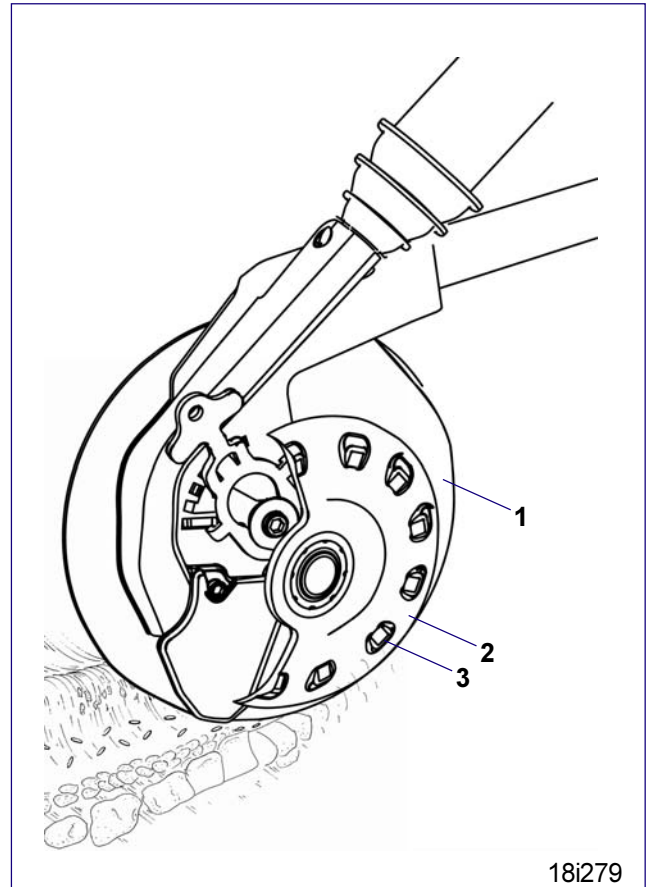


Fig. 2.5

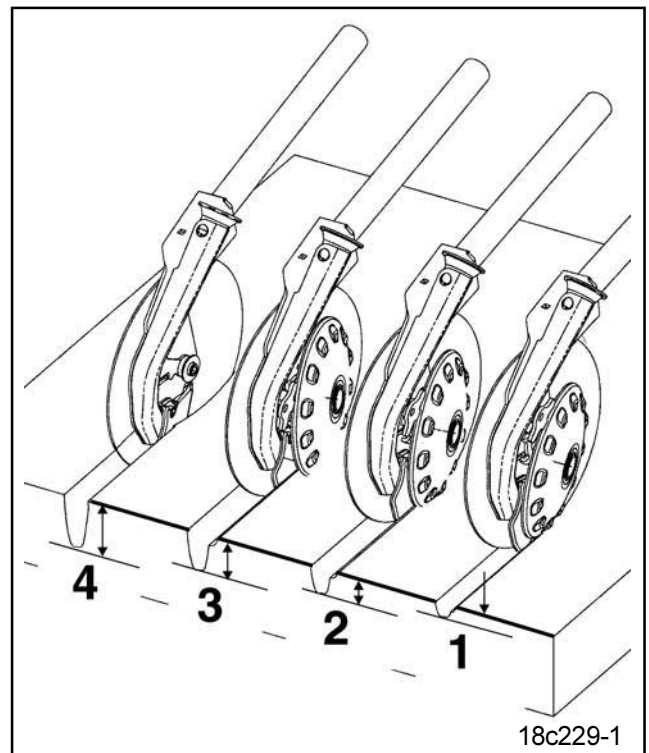


Fig. 2.6

2.11 Hydraulic circuit diagram – Pack Top seed drill AD-P Special

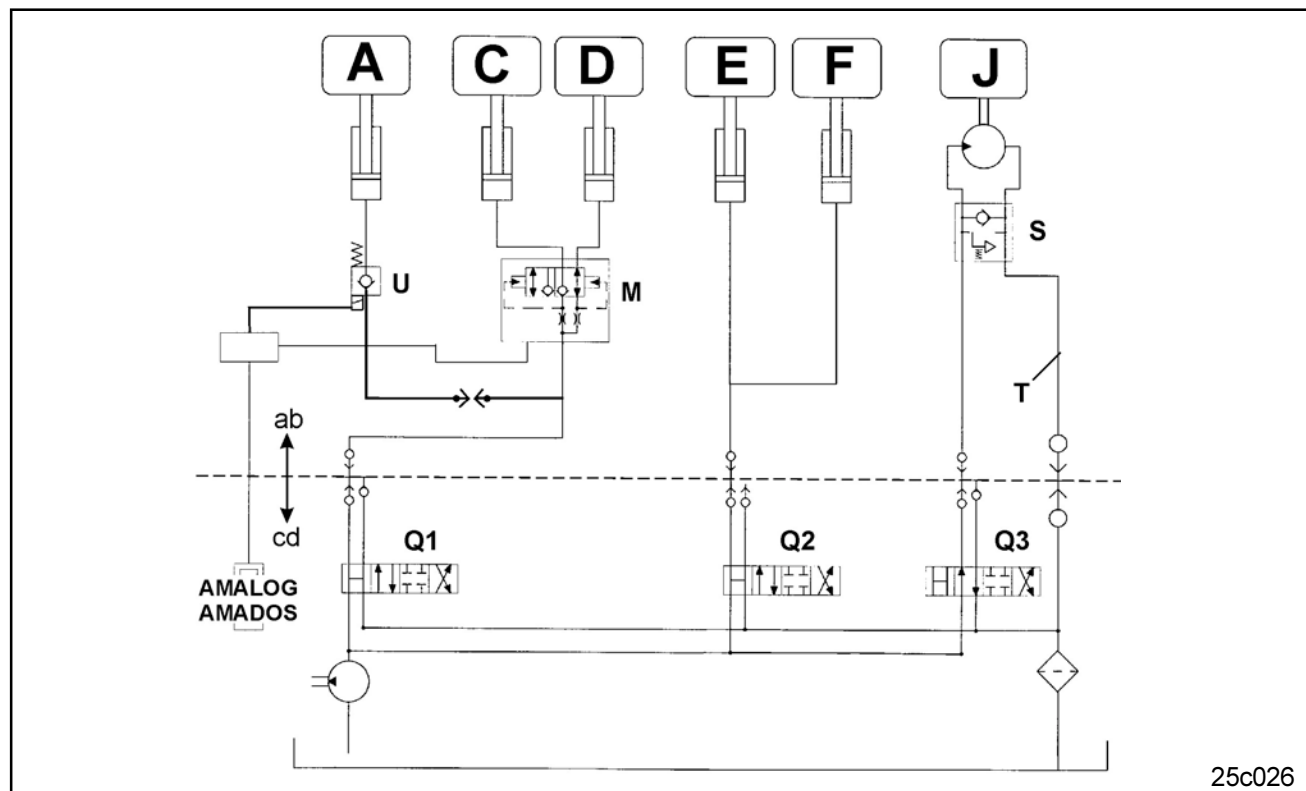


Fig. 2.7

Description

ab = implement side
cd = tractor side

Tractor control spool valves Q1 up to Q3

= 3 tractor control spool valves,
illustrated in position "operation"

Q3 = Valve for the hydraulic blower fan drive with
"priority" approx. 30 l/min.

Hydraulic rams

A = Pre emergence marker
C = Marker left hand side
D = Marker right hand side
E = Coulter pressure adjustment
F = Exact harrow pressure adjustment

Hydraulic drive

J = Blower fan hydraulic motor $N_{max} = 4000$
R.P.M.

M = Track marker shuttle valve
S = DBV-valve with hydraulic free wheel
T = free return flow (in minimum DN16)
U = electrohydraulic valve

max. 200 bar

955912

Permissible hydraulic oils

HD-SAE 20W-20 according to MIL-L-2104 C or API-
CD,
and
STOU SAE 15W-30 according to MIL-L-2105 or API
GL4.



**Before conducting any work on the
hydraulic system make it pressure less via
the tractor hydraulics.**



**The maximum operational pressure
must not exceed 200 bar .
You will find a relevant hint on your seed
drill.**

2.12 Details about noise level

The tractor operator seat related emission value (sound pressure level) is 74 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 tractor used.



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

2.13 Declined use of the machine

The AMAZONE-Pack Top Seed Drill AD-P Special has exclusively been designed for the usual operation for storing, metering and sowing common seeds in agriculture.

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

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



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

Though machines having been manufactured with great care, certain deviations from the seed rate or even a total failure of individual rows cannot totally be excluded, even at a declined use. These deviations may be caused e. g. by:

- varying composition of the seed (e.g. grain size, dressing, specific density, grain shape)
- drifting on slopes or mistakes by driving the following
- blockage or bridging, e.g. by swollen or germinating seed residue, foreign particles, bag residue etc.)
- undulated terrain
- wear of wearing parts (e.g. seed metering wheels etc.)
- damage by external influence
- wrong drive R.P.M. and travelling speed
- wrong setting of the machine (incorrect mounting, incorrect determination of the gearbox position).

Claims regarding damage not having occurred on the AMAZONE seed drill itself would be rejected. This also applies to damage due to sowing errors. Modifications made to the AMAZONE seed drill by the owner/user may result in damage and therefore the manufacturer does not accept liability for such damage.

3.0 Safety

To ensure trouble free operation we recommend that you carefully read this instruction manual and to strictly adhere to the advice given therein.

Please ensure that this instruction manual has been read by the operator before he starts to operate the machine.

In this instruction manual you will find many hints which will provide you with a trouble-free operation. These descriptions have been supplemented by many illustrations in order to explain all functions and to give you hints for safety and operation under varying operation conditions. Please observe and adhere strictly to all safety advice.

3.1 Dangers when not adhering to the safety advice

Not adhering to the safety advice

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

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

- Failure of important functions of the machine
- Failure of prescribed measures for maintenance and repair
- Danger for persons by mechanical or chemical affects
- Danger to persons or to the environment by leaking hydraulic oil.

3.2 Qualification of operator

The AMAZONE-Pack Top Seed Drill AD-P Special may only be operated, maintained and repaired by persons, who are acquainted with it and have been informed of the relevant dangers.

3.3 Symbols in this instruction manual

In this instruction manual many warning, attention and hints are identified by symbols. The explanation for these symbols please find in the following:



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



Attention symbol

The attention advice in this operation manual which may cause dangers for the machine and its function when not being adhered to, are identified with the attention symbol.



Hint symbol

Hints regarding machine's specific functions, which have to be adhered to for a faultless function of the machine are identified with the hint symbol.

3.4 Warning pictographs and hint symbols on the machine

The warning pictographs (e.g. Fig. 3.1) indicate dangerous points on the machine. Observing these pictographs means safety to all persons using this machine.

The hint symbols (e.g. Fig. 3.2) mark machine's specific points which have to be observed to ensure correct function of the machine.

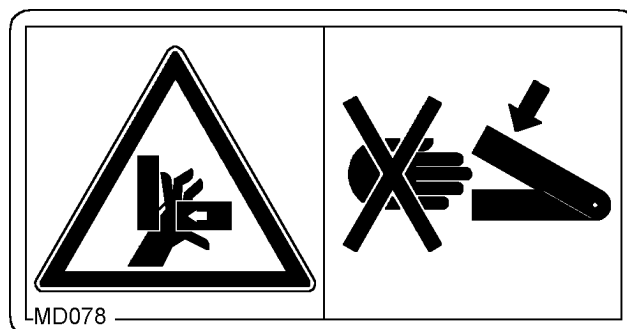


Fig. 3.1

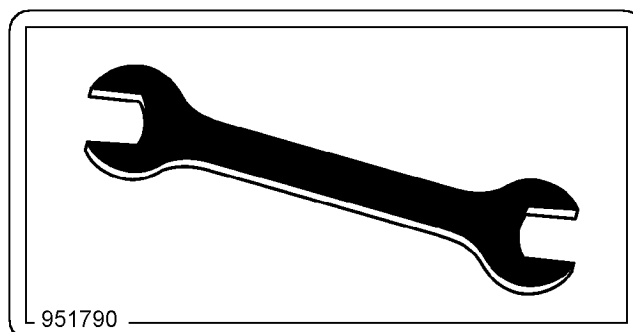


Fig. 3.2

The machine's fixing points for the warning pictographs and hint signs are illustrated in Fig. 3.3. Please refer to the following pages for relevant explanations. Please make these explanations also available for other users.

Please always keep all warning pictographs and hint signs clean and in readable condition. Please ask for replacement of damaged or missing warning signs from your dealer and attach them in the relevant plate. (Picture-No.: = Order-No.).

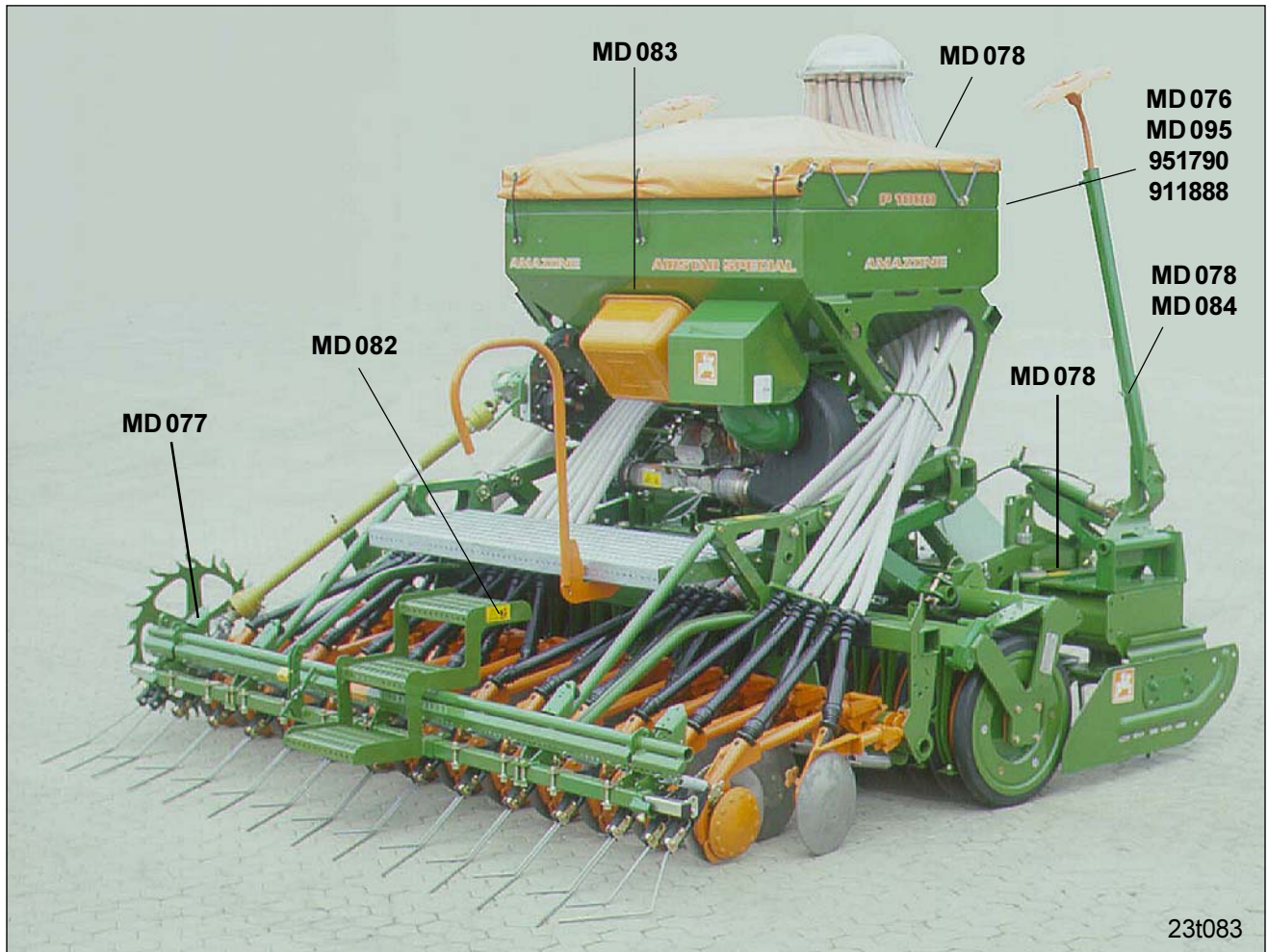


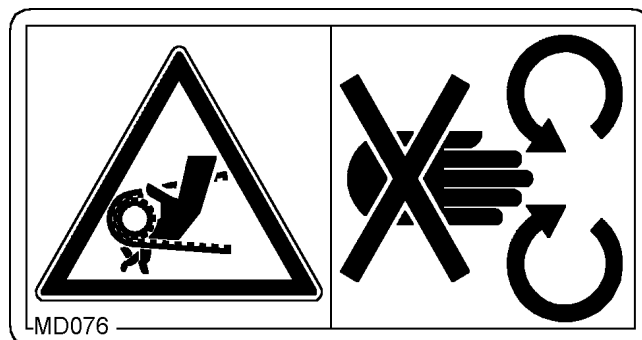
Fig. 3.3

Picture No.: MD 076

Explanation:

Start operating the implement only with all guards fitted.

Do not remove guards while the engine is running.
Before removing the guards, switch off the PTO shaft and the engine, remove ignition key.



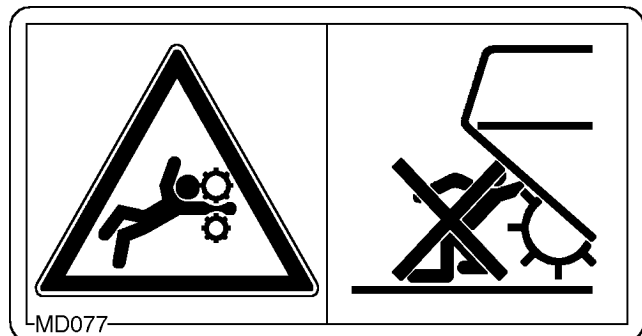
Picture No.: MD 077

Explanation:

Danger of bruising while machine is running.

Keep sufficient clearance from the implement when it is started or running.

Advise persons to leave the danger area as long as parts may still be moving.

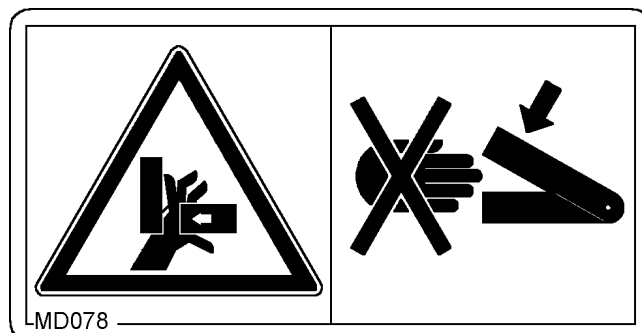


Picture No.: MD 078

Explanation

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

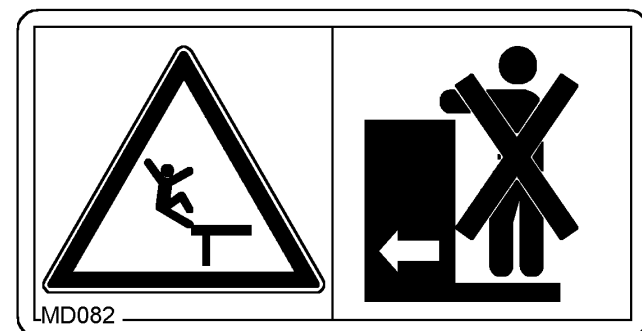
Advise persons to leave the danger zone.



Picture No.: MD 082

Explanation

Sitting or standing on the implement (not even on the loading board) during operation or during road transport is prohibited.

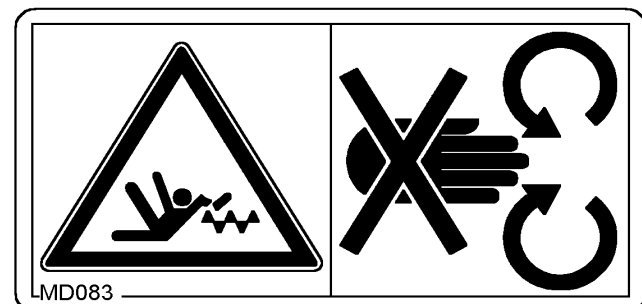


Picture No.: MD 083

Explanation

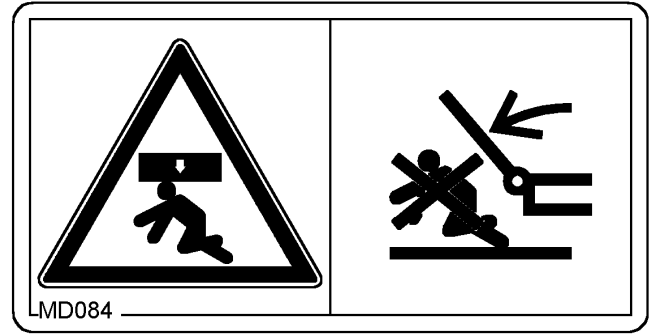
Danger of injury

Never reach into the seed box

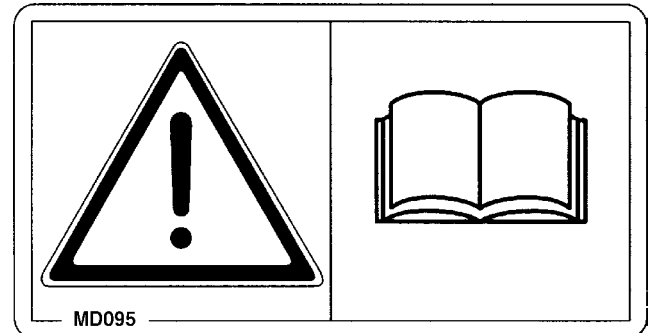


Picture No.: MD 084
Explanation

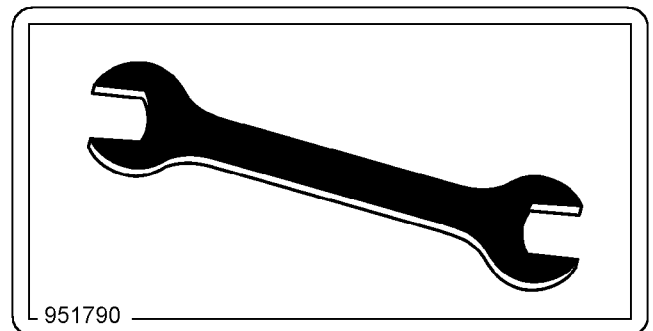
Never stay within the operational area of the marker arms.


Picture No.: MD 095
Explanation

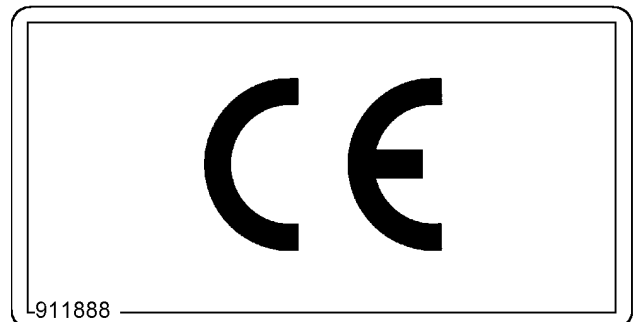
Before starting operation read and observe instruction manual and safety advice.


Picture No.: 951790
Explanation

Retighten bolts frequently and after some hours of operation.


Picture No.: 911888
Explanation

The CE-sign indicates that the machine fulfils the requirements of the EC-guide line machine 89/392/EC and the corresponding additional guide lines.





3.5 Safety conscious operation

In addition to the safety advice in this operation manual the national, and general operational safety and accident preventive descriptions of the authorised trade association are binding, especially UVV 3.1, UVV 3.2 and UVV 3.3.

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

3.6 Safety advice for the operator

3.6.1 General safety and accident prevention advice

Basic principle:

Always check traffic and operational safety before putting the implement into any operation!

1. Adhere to the general rules of health- and safety precautions as well as to the hints in this instruction manual.
2. The warning- and hint signs fixed to the machine give important hints for the safe operation of the machine. Adhering to them serves your safety.
3. When making use of public roads adhere to the applicable traffic rules.
4. Become acquainted with all devices and controlling elements as well as their function before commencing work. Doing this during operation would be too late.
5. The clothing of the operator should fit tight. Avoid wearing loose clothing.
6. To avoid risk of fire keep the machine clean.
7. Before beginning to drive check your surroundings (children). Ensure sufficient visibility.
8. Sitting or standing on the implement during operation or during transport is prohibited.
9. Mount the implement only with the prescribed tools.
10. Special care should be taken when the implement is coupled to or from the tractor.
11. When mounting or dismounting bring parking supports into their correct position (otherwise danger of tipping over).
12. Affix any ballast weights always as prescribed to the correct fixing points.
13. Check maximum permissible axle loads, total weights and transport dimensions.
14. Do not exceed maximum permissible transport measurements of the traffic department.
15. Check and fit equipment for road transport, e. g. traffic lights, warning plates and road safety guards.
16. The release ropes for quick couplings must be hanging freely without any possibility of being actuated and releasing the quick couplings by themselves.
17. Never leave the tractor seat during driving.
18. The machines stability, steering and braking are affected by mounted implements, trailers and ballast weights. Therefore, take account of these effects and allow for changes to the steering and to stopping distances when braking.
19. When lifting the implement the front axle load of the tractor is reduced by differing amounts depending on the size of the tractor. Always check that the necessary front axle load of the tractor (20 % of the tractor's net weight) is maintained. (Please also adhere to the instruction manual of the tractor manufacturer.)
20. When driving into corners and/or bends watch out for the projection to the sides and the gyrating mass of the implement.
21. Operate the implement only when all guards are fixed in position.
22. Never allow yourself or others to stay within the operational area.
23. Filling the seed box may only be carried out with the tractor engine stopped, a removed ignition key and the parking brake applied.
24. Do not stay within the operational range of rotating and swivelling parts of the implement.
25. Hydraulically folding parts may only be actuated when there is nobody standing within the moving range.
26. On all hydraulically actuated pivoting parts there exists danger of injury by bruising and trapping.
27. Before leaving the tractor lower the implement to the ground. Actuate the parking brakes, stop the engine and remove the ignition key.
28. Nobody should stand between tractor and implement unless the tractor is secured against rolling away by engaging the parking brake and/or by the use of wheel chocks with engine switched off and ignition key removed.
29. Lock track markers in transport position.

3.6.2 General safety and accident prevention advice regarding the implement mounted to the tractors three-point linkage

1. Before mounting- and dismounting implements to the three-point-linkage bring all control levers into a position so that unintentional lifting or lowering is impossible.
2. When fitting the implement to the three-point linkage the mounting categories on the tractor and the implement must coincide.
3. When within the range of the three-point linkage there is a danger of bruising and shearing.
4. When actuating the control levers for the three-point linkage never stand between tractor and implement.
5. In transport position always take care for sufficient lateral locking of the tractors' three-point linkage.
6. When driving on public roads with lifted implement the control lever has to be locked against unintended lowering.
7. Mount and dismount implements as described. Check braking systems for function. Pay attention to the manufacturers advice.
8. Working implements should only be transported by tractors that are designed for this task.

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

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



3.6.4 General safety and accident prevention advice regarding the hydraulic system

1. The hydraulic system is under high pressure!
2. When connecting hydraulic rams and motors the described connection of the hydraulic hoses has to be followed!
3. When connecting the hydraulic hoses to the tractor's hydraulics take care that the hydraulics are pressure less on the tractor as well as on the implement side!
4. At hydraulic function connections between tractor and implement, the sockets and plugs should be colour coded in order to avoid incorrect operation! When mixing up connections, there is a danger of reverse function, e. g. lifting instead of lowering. Danger of accident!
5. Regularly check hydraulic hoses and exchange them in cases of damage or ageing. The replacement hoses have to correspond to the technical demands of the implement manufacturer!
6. When searching for leaks appropriate aids should be used due to danger of injury!
7. Liquids (hydraulic oil) penetrating under high pressure may penetrate the skin and cause severe injuries. In case of injuries immediately consult a doctor. Danger of infection.
8. Before starting to do any repair work on the hydraulic system, lower the implement, relieve the hydraulic system from pressure and switch off the engine.
9. The period of use of any hose circuit should not exceed six years including a storage 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 thermoplastics other guide lines may prevail.

3.6.5 General safety and accident preventive advice for PTO shaft operation

1. Only use the PTO shaft recommended by the manufacturer.
2. Guard tubes and cones of the PTO shaft as well as a tractor- and implement PTO guard must be fitted and kept in the correct place.
3. Note the prescribed PTO-shaft tube guards in transport- and operating position.
4. Mounting and dismounting PTO shaft only with disengaged PTO shaft, stopped motor and removed ignition key.
5. Always ensure that the PTO shaft has been correctly assembled and secured.
6. Prevent the PTO shaft rotating by suspending chains.
7. Before switching on the PTO shaft make sure that the PTO shaft speed of the tractor matches the permissible PTO speed of the implement.
8. 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.
9. Before switching on the PTO shaft nobody is allowed to stay in the area of the spinning PTO-shaft.
10. Never switch on the PTO shaft while the engine is stopped.
11. When operating with the PTO shaft nobody is allowed to stay in the area of the spinning PTO- or universal joint shaft.
12. Always switch off PTO shaft when it is in an adverse position or not needed.
13. 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.
14. 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.
15. Deposit removed PTO shaft on the provided carrier.
16. After removal of the PTO shaft replace protective cap over the tractor's PTO! Never remove the PTO shaft cap from machine and tractor.
17. Remedy of damage is to be undertaken before starting to operate with the implement.

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

1. Repair, maintenance- and cleaning operations as well as the correction and remedy of a function or fault should in principal be conducted with the engine and drive to the implement stopped. Remove ignition key.
2. Check nuts and bolts regularly for tightness and retighten if necessary.
3. When doing maintenance work on a raised implement make sure that it is secured by proper supports.
4. When exchanging parts with cutting edges use appropriate tools and wear gloves.
5. Dispose of oil, grease and filters in the appropriate environmentally approved manner.
6. Before doing any repair work on the electric disconnect power supply.
7. Before conducting electric welding operations on tractor or on the mounted implement, remove cable from generator and battery.
8. Any spare parts fitted, as a minimum requirement, must meet with the implement manufacturers' fixed technical standards. This is, for example, ensured by using original AMAZONE spare parts.

3.6.7 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.



3.7 Determination of total weight, axle loads, load capacity of the tyres as well as the required minimum ballast when combining tractor and 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 tyres must not be exceeded. Observe the sufficient tractor front axle load (20 % of the tractor's net weight).

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

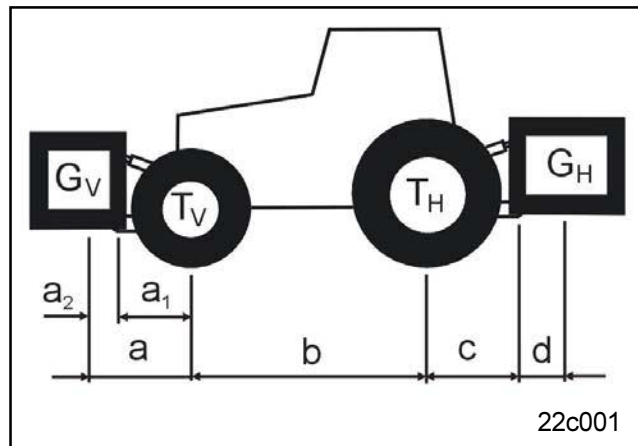


Fig. 3.10

For the calculation you need the following data:

T_L [kg]	Net/empty 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]	The distance a is the sum of the distances a_1 and a_2	❷ ❸
a_1 [m]	Distance between front axle and centre lower link ball	❶ ❸
a_2 [m]	Distance between centre of lower link ball and centre of gravity front mounted implement	❷
b [m]	Wheel base of the tractor	❶ ❸
c [m]	Distance between centre rear axle and centre lower link ball	❶ ❸
d [m]	Distance between centre lower link ball and centre of gravity rear mounted implement / rear ballast	❷

- ❶ see instruction manual tractor
- ❷ see para. "Technical data" and / or price list for the implement
- ❸ measure

t178-d04

Rear mounted implement or front-rear mount combinations

1) Calculation (see Fig. 3.11) of minimum ballast front GV min

Enter into table Fig. 3.16 the calculated minimum ballast required for the tractor front.

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

Fig. 3.11

Front mounted implement

2) Calculation (see Fig. 3.12) of minimum ballast rear GH min

Enter into the table Fig. 13.6 the calculated minimum ballast required at the rear of the tractor. For “x” please refer to the indications of the tractor manufacturer. If no data available, take “x” = 0.45.

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

Fig. 3.12

3) Calculation (see Fig. 3.13) of the actual front axle load TV 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.

Enter into table Fig. 3.16 the calculated actual front axle load and the front axle load indicated in the instruction manual of the tractor.

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

Fig. 3.13

4) Calculation (see Fig. 3.14) 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 rear ballast.

Enter into the table Fig. 3.16 the calculated actual total weight and the total weight indicated in the instruction manual of the tractor.

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

Fig. 3.14

5) Calculation (see Fig. 3.15) of the actual rear axle load T H tat

Enter into table Fig. 3.16 the calculated actual rear axle load and the permissible rear axle load indicated in the instruction manual of the tractor.

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

Fig. 3.15

6) Tyre load capacity

Enter into the table 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 or equal 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	<div>/</div> kg	---	---
Total weight	<div></div> kg	<div></div> kg	---
Front axle load	<div></div> kg	<div></div> kg	<div></div> kg
Rear axle load	<div></div> kg	<div></div> kg	<div></div> kg

Fig. 3.16

t178gb03

4.0 Preparing for machine operation

Carefully read and adhere to the instruction manual and safety advice before putting your seed drill to operation.

Acquaint yourself with the correct methods of handling and with all operating devices. Never allow the machine to be operated by persons that have not been informed about the operation of the machine.

Maintain your machine in a good operational order. Changes to the machine that are not approved by the manufacturer may endanger the functionality and/or safety and may reduce the life span of the machine. Claims for warranty on the machine and / or for spare parts will be rejected in cases of operational errors.

Liability claims will only be considered if exclusively original AMAZONE spare parts and wearing parts are used for replacement.

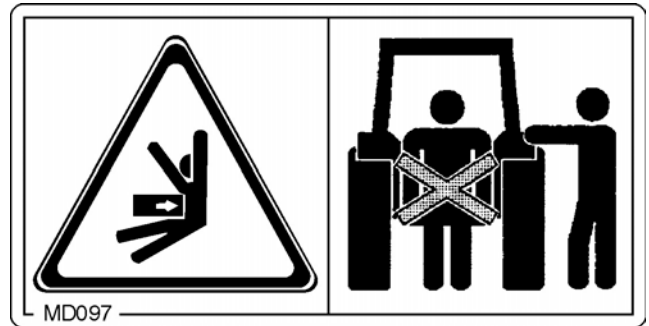


Fig. 4.1



Do not reach with your hands into the seed box.
Danger of injury from moving parts.



Never place any parts inside the seed box, as the agitator and the metering units may be damaged.



Do not stay between tractor and implement. Danger of injury.
Do not let other people work between tractor and machine when the implement combination is coupled to the tractor.
When actuating the three point linkage outside the tractor cab do not step between tractor and implement.
The warning pictograph (Fig. 4.1) attached to the implement points out the danger existing when working between tractor and implement.

4.1 First fitting

Affix the parts that have been loosely supplied to your seed drill:
extra coverage following harrow according to para. 14.1.

Attach the Pack Top seed drill to an AMAZONE soil tillage implement according to para. 5.0.

Attach your Pack Top seed drill to the soil tillage

implement of another manufacturer according to para. 6.0.

Attach blower fan with belt drive according to para. 7.0.

Attach the hydraulic blower fan drive according to para. 8.0.

Connect the connecting valve Q1 (Fig. 2.7) with hydraulic coupling (Fig. 4.2/1) to a single acting control spool valve on the tractor.

- The track markers and
 - the pre-emergence marker unit (option)
- are connected with the connecting valve Q1.

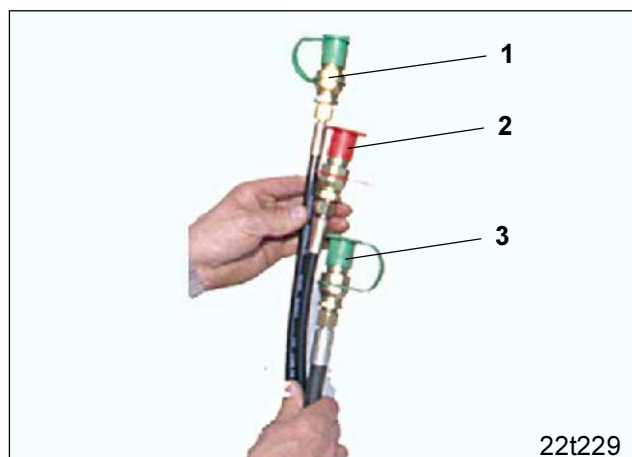


Fig. 4.2



Observe the safety advice according to para. 3.6.4.

Actuate control valve only from inside the tractor cab.

-when actuating the control valve the hydraulic rams

- for actuating the track marker and
 - the pre-emergence marker (option)
- are simultaneously pressurised.**

Advise persons to leave the danger area.

Danger from moving parts.

Connect the connecting valve Q2 with hydraulic coupling (Fig. 4.2/2) to a single acting control spool valve on the tractor.

- The hydraulic coulter pressure adjustment (option) and
- the hydraulic extra coverage following harrow pressure adjustment (option)

are connected with the connecting valve Q2.



Observe the safety advice according to para. 3.6.4.

Actuate control valve only from inside the tractor cab.

when actuating the control valve the hydraulic rams

- of the coulter pressure adjustment and
 - the extra coverage following harrow pressure adjustment
- are simultaneously pressurised.**

Advise persons to leave the danger area.

Danger from moving parts.

Filling the seed box according to para. 9.0.

Set the metering unit to the seeds to be sown according to para. 10.0.

Determine the gearbox setting position for the desired seed rate according to para. 11.0.



Check the hydraulic hoses before and during operation according to para. 18.7.1.

4.2 Setting up the machine in the field

Bring markers into operating position according to para. 12.1.

Bring marker discs of the pre emergence marker in operating position according to para. 16.2.

Bring the outer harrow of the extra coverage following harrow into operating position according to para. 14.2.

Bring star wheel in operating position

- the star wheel is inserted to transport width (Fig. 4.3) and secured with a lynch pin (Fig. 4.4/1).
- Slacken the lynch pin (Fig. 4.4/1) and pull out the star wheel until it can be lowered to the ground (Fig. 4.5). Insert the previously removed lynch pin in the second hole (Fig. 4.4/2).



Be especially careful when bringing the star wheel into operation or transport position. Danger of injury.

Set markers to the required length (see para. 12.2).

Travel with the seed drill approx. 30 m in the field at the expected working forward speed and check the following settings:

- Seed placement depth of the seed, readjust if necessary according to para. 13.0.
- Check settings of the extra coverage following harrow, if necessary readjust according to para. 14.3 or para. 14.4.
- Check working intensity of the marker discs, readjust if necessary.

Set the markers in such a way that they mark on the correct side.

Set the metering wheel tramlining control in the AMADOS/AMALOG-on board computer to the correct start figure (see instruction manual for AMADOS/AMALOG).

4.3 During operation

The seed level in the seed box can be monitored with the electronic monitoring-, control and regulating system "AMADOS/AMALOG" (option) (see operation manual for AMADOS/AMALOG).



Fig. 4.3

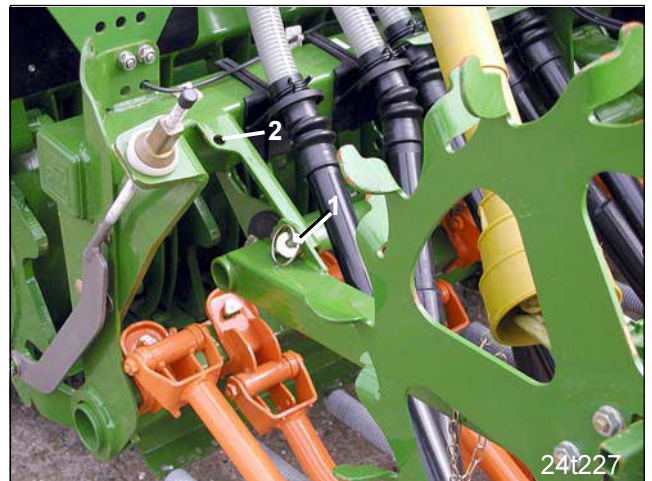


Fig. 4.4



Fig. 4.5



Do not remain in the danger area between machine and tractor.
Observe the large protrusion of the track markers. Danger of injury.



Refill seed box in good time.
Never empty the seed box completely.

4.4 After the first 10 hours of operation



Check all bolted connections for tightness after the first 10 hours of operation and retighten if necessary.

4.5 Parking the AD-P combination

In combination with the soil tillage implement the AD-P Special can be parked after operation without supports.

If you intend to park the AD-P Special separated from the soil tillage implement, the standing stability of the AD-P Special is only ensured when the seed drill is parked on the support stands. Affix the seed box parking supports (Fig. 4.6/1) and the coulter frame parking supports (Fig. 4.6/2) before you part the seed drill.



When parking the seed drill on the parking supports the weight of the seed inside the seed box must not exceed 50 kg.

Raise the combination by using the tractor's hydraulic system to attach the parking supports. Before parking the combination pull the depth setting pins (Fig. 4.7/1) of the AMAZONE soil tillage implement have off the setting quadrant brackets (Fig. 4.7/2).



When reinserting the depth setting pins (Fig. 4.7/1), please hold them only in such a way that your hand will never get trapped between the pin and the carrying arm. After reinserting, secure pins.



Fig 4.6

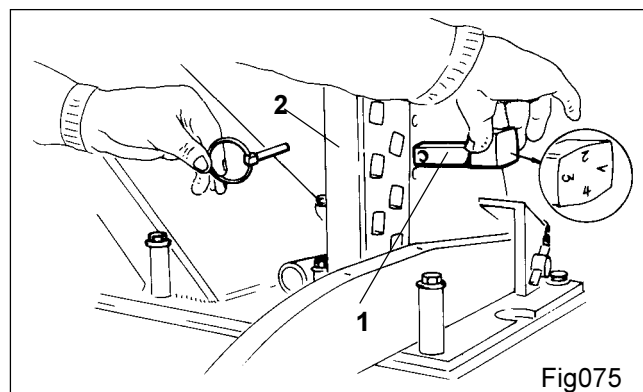


Fig 4.7

5.0 Mounting the Pack Top seed drill AD-P Special onto rotary harrows KE and rotary cultivators KG

5.1 Equipping wedge ring rollers KW580 and tyre packer rollers RP with coupling parts



For coupling park the roller on level ground and care for a safe support (secure against falling over and rolling away).

Fasten coupling parts (Fig. 5.1/1) with the carrying arm pins (Fig. 5.1/2) and the clamps (Fig. 5.1/3) to the roller (please also see Fig. 5.2 up to Fig. 5.4).



Always attach the carrying arms of the wedge ring roller KW580 and the tyre packer roller with each two carrying arm pins (Fig. 5.4/1) onto the roller.

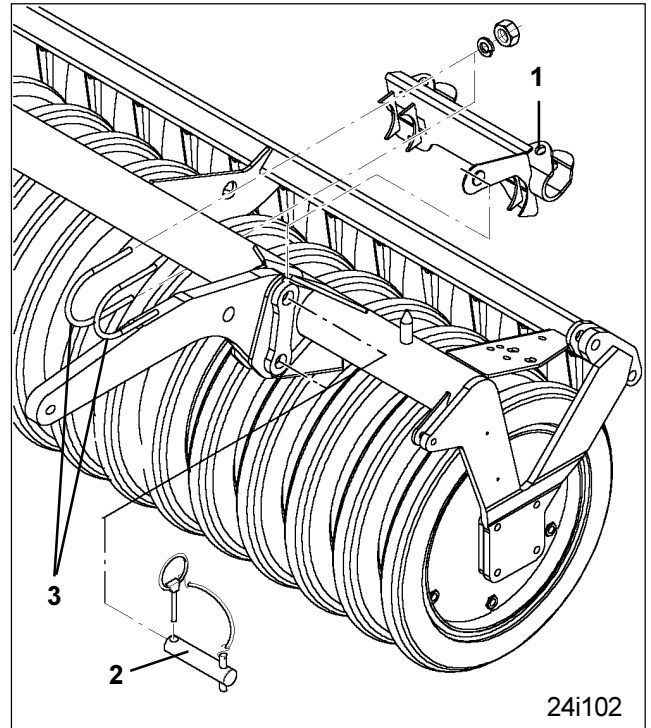


Fig. 5.1



Fig. 5.2



Fig. 5.3



Fig. 5.4

5.2 Equipping wedge ring roller KW450 and tooth packer roller PW500 with coupling parts



For coupling park the roller on level ground and care for a safe support (secure against falling over and rolling away).

Attach coupling parts (Fig. 5.5/1) by using clamps (Fig. 5.5/2) to the roller, directly beside the carrying arms (Fig. 5.5/3).

5.3 Attaching the coupling frame onto the rotary harrow/cultivator KE/KG

Set the coupling frame (Fig. 5.6/1) by using pins (Fig. 5.6/2) on the brackets (Fig. 5.6/3) previously attached to the soil tillage implement. Secure the pins by using expansion pins.

Set the upper three point of the coupling frame and the soil tillage implement with a top link (Fig. 5.6/4) and secure the setting pins by using lynch pins.

Align the coupling frame with the top link (see Fig. 5.7).

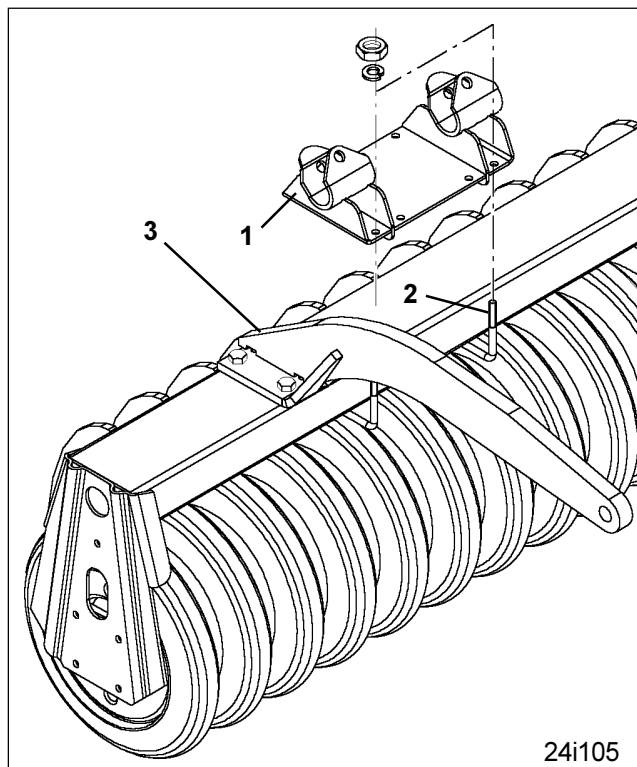


Fig. 5.5

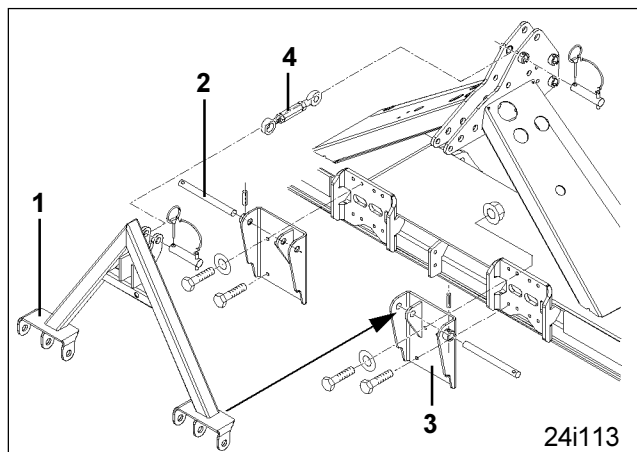


Fig. 5.6



Fig. 5.7

5.4 Coupling the AD-P SPECIAL

Back up with the soil tillage implement to the seed drill (Fig. 5.8) parked on a level ground.

Pick up the AD-P SPECIAL with the coupling frame (Fig. 5.9/1) and set the joint using a pin (Fig. 5.10/1). Secure using a lynch pin.



Fig. 5.8



Fig. 5.9

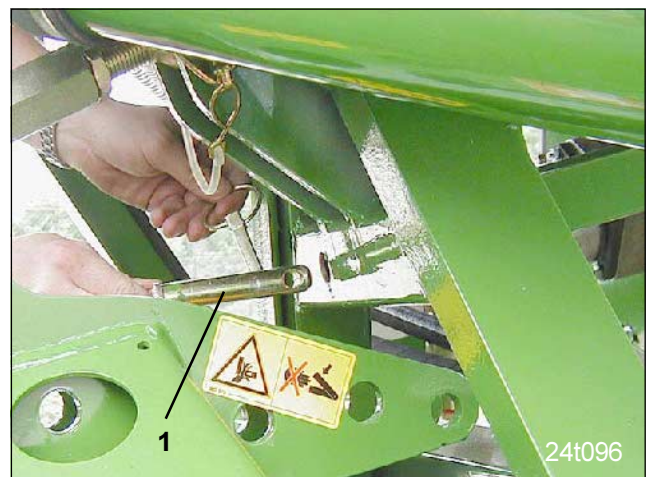


Fig. 5.10

Take the pin (Fig. 5.11) in your hand – when not in use insert the pin in the bracket (Fig. 5.11/1) – and secure the joint (Fig. 5.12) using pins and lynch pins.

Connect the track marker sensor cable (Fig. 5.13).

Align the Pack Top seed drill with the aid of the top link (Fig. 5.9/2).

Lift up combination and remove support stands (Fig. 5.14/1) of the seed drill and the coulter module.



Due to its very close centre of gravity design parts of the combination may damage the rear window of the tractor when being lifted.



Fig. 5.11

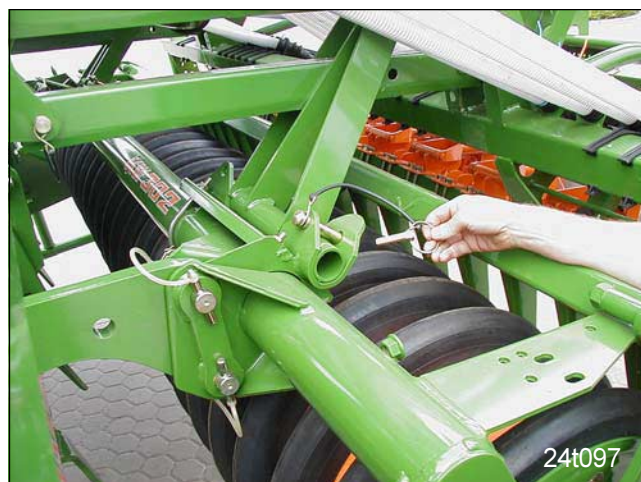


Fig. 5.12



Fig. 5.14



Fig. 5.13



Fig. 5.15

6.0 Attaching AMAZONE-Pack Top seed drills AD-P Special onto soil tillage implements of other manufacturers

The soil tillage implement must be designed in such a way that it is strong enough to bear the additional load when the AMAZONE Pack Top seed drill AD-P Special is attached.

Therefore the AMAZONE Pack Top seed drill AD-P Special can only be attached onto rotary harrows of Messrs. Kuhn, Lemken, Maschio and Rabe.

In this case the blower fan of the AD-P Special may only be driven hydraulically. Blower fan drive via V-belt is not possible.



Fig. 6.1



Before fitting the coupling parts and attaching the seed drill AD-P Special onto soil tillage implements of other manufacturers, please carefully observe the safety advice at the beginning of this instruction manual.

If you intend to attach the seed drill to rotary harrows of other manufacturer, you will need other coupling parts than those for attaching the seed drill onto AMAZONE soil tillage implements. Therefore always indicate the intended soil tillage implement to be used when ordering your Pack Top seed drill.

Order the mounting frames for Lemken, Maschio and Rabe from the manufacturer. They must be suited for seed drills up to 1700 kg at 0.7 m centre of gravity spacing.



When resetting the working depth of the soil tillage implement always carry out a basic setting of the Pack Top seed drill AD-P Special according to para. 6.1.1 and check the placement depth of the seed.

This is necessary because the coulter frame of the AD-P Special is (contrary to AMAZONE combinations) firmly connected with the soil tillage implement of other manufacturers.

6.1 Mounting the Pack Top seed drill AD-P Special to Kuhn rotary harrow

Attach the supplied "AMAZONE mounting frame" onto the Kuhn rotary harrow.

The rigging screws (Fig. 6.5/3) are fitted when your seed drill AD-P Special is supplied.

Pick up the AD-P Special with the coupling frame (Fig. 6.2) and set the joint by using a pin (Fig. 6.3/1) and secure with a clip pin.

Affix the coulter frame closely behind the roller, however, ensure that coulter frame and roller do not touch. The distance can be varied by setting the coulter frame in one of the 3 (Fig. 6.4/1). After re-setting secure the pins by using clip pins.

Ensure that the seed guide hoses (Fig. 6.5/4) do not sag. Shorten if necessary.

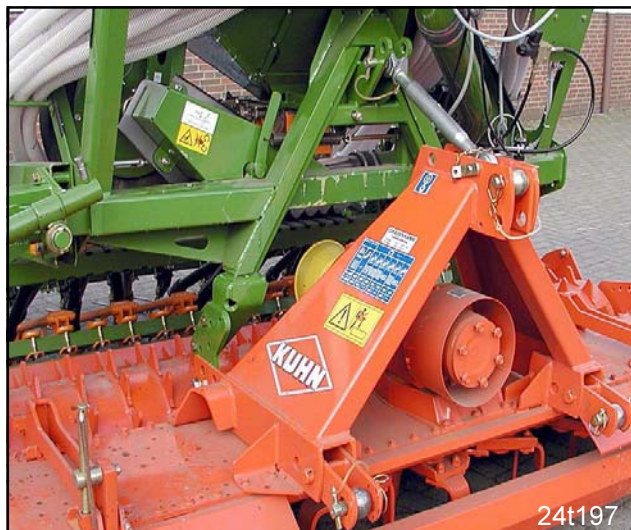


Fig. 6.2



Fig. 6.3



Fig. 6.4

6.1.1 Basic setting of the Pack Top seed drill AD-P Special

Before carrying out the following settings on the turn-buckles, set the desired working depth of the rotary harrow.

Align the AD-P Special on the rotary harrow. The setting is done with the aid of the top link (Fig. 6.5/1).

By adjusting the rigging screws (Fig. 6.5/3) create the correct distance between lower edge of the frame main tube (Fig. 6.5/2) and the touch down point of the roller drum (not the roller teeth). The distance is 550 mm (see Fig. 6.5).



Fig. 6.5

6.2 Mounting the Seed drill AD-P Special onto rotary harrows from Messrs. Lemken/Maschio/Rabe

For mounting AMAZONE-seed drill AD-P Special, please refer to

rotary harrows from Messrs. Lemken (see Fig. 6.6)
rotary harrows from Messrs. Maschio (see Fig. 6.7)
rotary harrows from Messrs. Rabe (see Fig. 6.8)

Attach and secure the mounting frame of the rotary harrow manufacturer according to the relevant fitting instruction.



Fig. 6.6



Fig. 6.7



Fig. 6.8

The rigging screws (Fig. 6.91) are fitted when your seed drill AD-P Special is supplied.

Pick up the AD-P Special by using the mounting frame (Fig. 6.10).

Slacken the M8 saucer head bolts (Fig. 6.11/2) and push the setting stand (Fig. 6.11/1) against the locking pin (Fig. 6.11/3). Firmly retighten the M8 saucer head bolts. The setting stand can be adjusted with the aid of the hex. bolt (Fig. 6.11/4).

Secure the locking pin (Fig. 6.11/3) by using a lynch pin (Fig. 6.11/5) to prevent an unintended uncoupling.



Fig. 6.9



Fig. 6.10

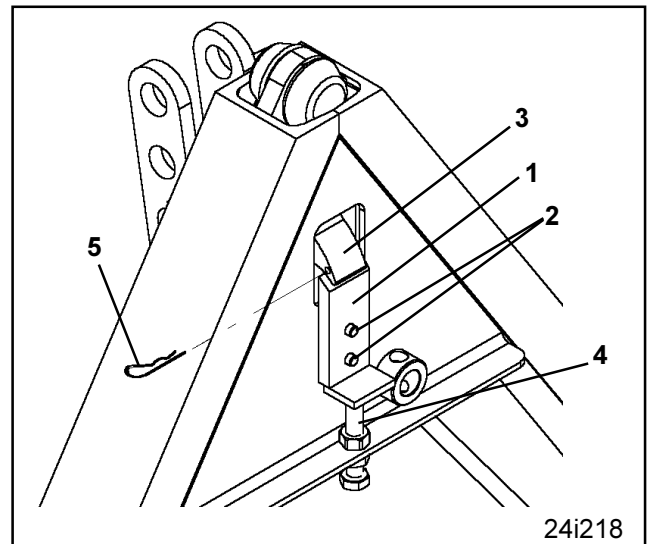


Fig. 6.11

Affix the coulter frame closely behind the roller, however, ensure that coulter frame and roller do not touch. The distance can be varied by setting the coulter frame in one of the 3 (Fig. 6.12/1). After re-setting secure the pins by using clip pins.

Ensure that the seed guide tubes (Fig. 6.13/1) do not sag. Shorten if necessary.

Carry out the basic setting of the Pack top seed drill AD-P Special as described in para. 6.1.1.



Fig. 6.12



Fig. 6.13

7.0 Blower fan with belt drive

The blower fan of the AD-P SPECIAL can either be driven hydraulically or mechanically by a belt drive (only in combination with AMAZONE soil tillage implements).

If the blower fan of the AD-P SPECIAL shall be driven by a belt drive, the gearbox of the rotary harrow or rotary cultivator has to be equipped with a PTO through drive (Fig. 7.2).



When the AD-P Special is fitted with a belt drive, the soil tillage implement may only be driven with a tractor universal joint shaft speed of max. 1000 R.P.M.

7.1 Fitting the belt drive

Align the Pack Top seed drill with the aid of the top link (Fig. 7.1/1) .



Changing the top link arm length (Fig. 7.1/1) affects the belt run. Ensure parallelism so that the belt pulleys align.

Push the large belt pulley (Fig. 7.2/1) onto the shaft of the PTO shaft through drive until it is in alignment with the small belt pulley (Fig. 7.3/1) which is fixed on the blower fan drive shaft of the AD-P Special.

Affix the belt pulleys using taper tensioning bushings as described in para. 7.2.



Retighten the taper tensioning bushings after the first hour of operation.

The blower fan of the AD-P SPECIAL is driven by two V-belt pulleys (Fig. 7.3). Ensure that the V-belts have the prescribed belt tension.

At 5 kg load (see Fig. 7.4) it must be possible to batter the V-belt in the centre between the V-belt pulleys by approx. 12 mm.



Fig. 7.1



Fig. 7.2



Fig. 7.3

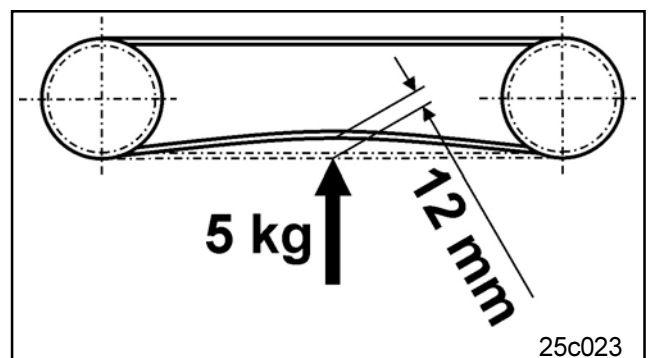


Fig. 7.4

Set the V-belt tensioning by adjusting the V-belt pulley with a turnbuckle (Fig. 7.5/1). Secure setting with the previously slackened counter nut.

In addition the V-belts are tensioned by a spring loaded tensioner (Fig. 7.6/1).

After every setting affix the guard hood (Fig. 7.7/1) using hex. bolts.

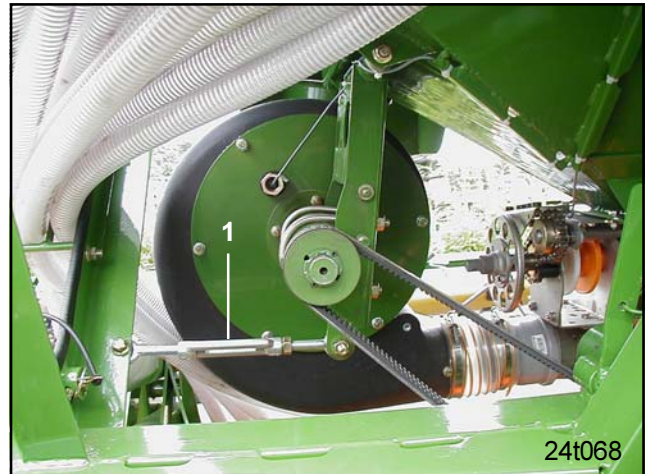


Fig. 7.5



Fig. 7.6



Fig. 7.7

7.2 Handling the taper tensioning bushings for V-belt pulleys

For mounting and dismounting the V-belt pulley an Allen key DIN 911 is required.

Fixing a V-belt pulley with a taper tensioning bushing

- Clean all bright surfaces of the taper tensioning bushing (Fig. 7.8/1) as well as the tapered bore of the V-belt pulley (Fig. 7.8/2)
- Insert the taper tensioning bushing into the tapered bore of the V-belt pulley in such a way that all connecting bores coincide (half threaded bores [Fig. 7.8/3] must be opposite half smooth bores [Fig. 7.8/4])
- Slide V-belt pulleys with taper tensioning bushing onto the shaft
- Position V-belt pulley with taper tensioning bushing on the shaft in such a way that driving- and power-take-off pulley are in alignment.
- Bolt tensioning bolts (Fig. 7.8/5) into the threaded holes facing each other and tighten with spanner for hex. nuts DIN 911. To improve the seating of the inner bushing knock it when tightening.
The torque of the tensioning bolt (Fig. 7.8/5) is for
 - the small belt pulley: 5,7 Nm
 - the large belt pulley: 49,0 Nm.



Retighten bolts (Fig. 7.8/5) of the taper tensioning bushings after the first hour of operation.

Loosening a V-belt pulley with the taper tensioning bushing

- Slacken tensioning bolt (Fig. 7.8/5) with Allen key
- Turn out one bolt and bolt into the bore (Fig. 7.9)
- Tighten bolt until the bushing gets loose from the hub and the pulley can be moved freely on the shaft.
- Remove pulley with bushing from the shaft.

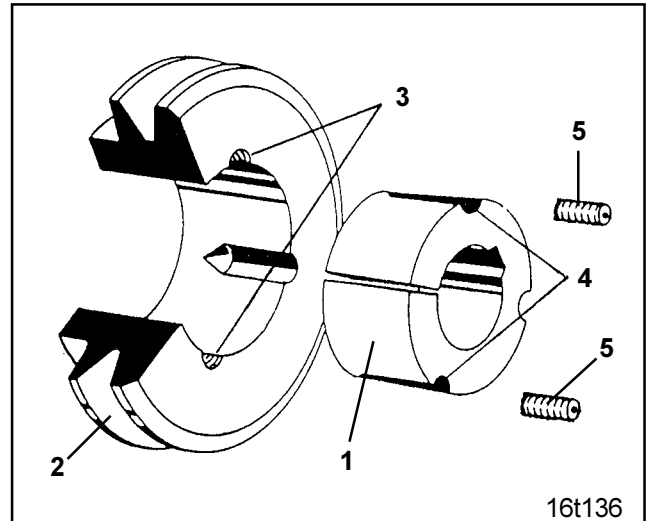


Fig. 7.8

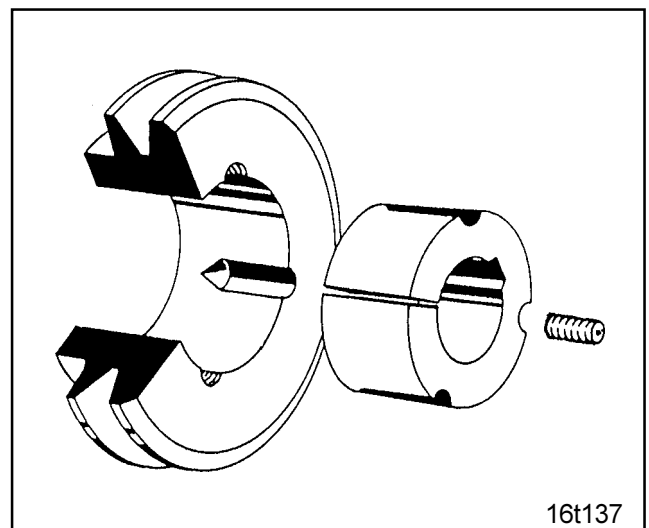


Fig. 7.9

7.3 Throttle flap

On machines which are equipped with a belt drive the blower fan speeds cannot be changed. These machines are equipped with a throttle flap to reduce the rate of air flow.

The throttle flap lever (Fig. 7.10/1) or the throttle flap can be set in two positions:

open: (see Fig. 7.10)
closed: (see Fig. 7.11).



Take the required throttle flap position from table (Fig. 10.2.

When swivelling the throttle flap lever (Fig. 7.11) upwards, the air stream is reduced.

A symbolic illustration (Fig. 7.12) of the throttle flap lever positions is attached to your seed drill.

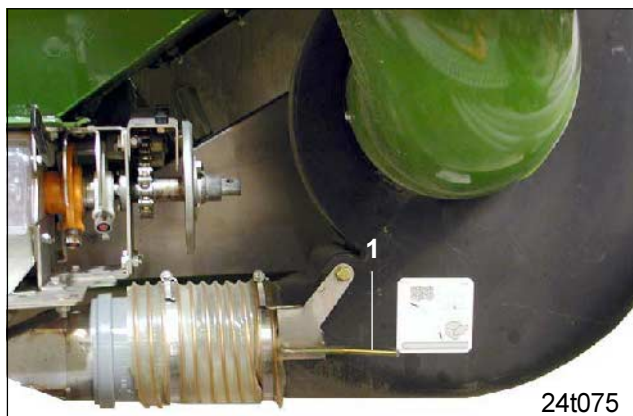


Fig. 7.10

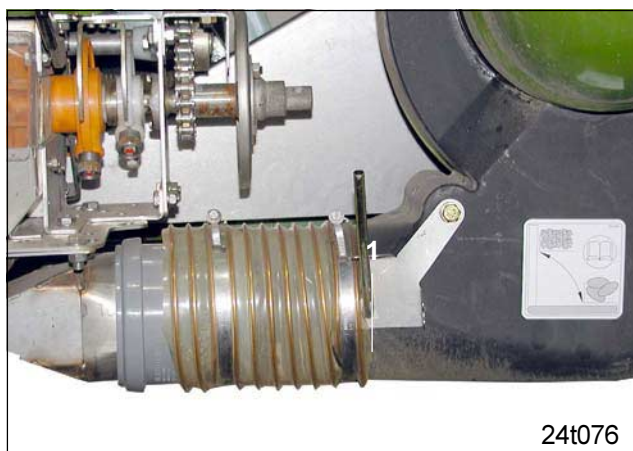


Fig. 7.11

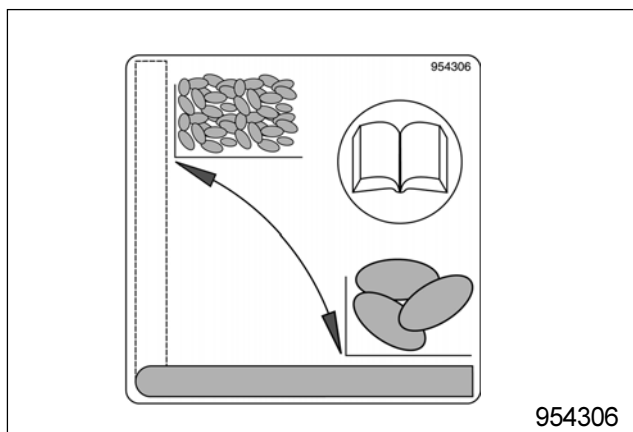


Fig. 7.12

8.0 Blower fan with hydraulic drive

The air flow for the seed delivery from the injector sluice to the coulters is provided by a blower fan which is driven by a hydro static motor (Fig. 8.3).

Connect the hydrostatic motor (Fig. 8.3) to the tractor's hydraulics according to the circuit diagram (Kap. 8.3).



Please observe the safety advice according to para. 3.6.4 .

8.1 Blower fan speed

The speed of the hydrostatic blower fan motor is monitored by the electronic monitoring-, controlling and regulating system AMADOS/AMALOG (see para. 8.2). You will find the required blower fan speed in the table (Fig. 8.1).



Do not exceed the maximum blower fan speed of 4000 R.P.M.

Set the blower fan speed on the pressure limiting valve (Fig. 8.2 or Fig. 8.6/3) or on the current regulating valve of the tractor (see below).

For setting the blower fan speed on the pressure limiting valve (Fig. 8.2)

- remove dust cap (Fig. 8.2/1)
- slacken counter nut
- set the speed with a screw driver on the valve as follows:

turn to the right hand side = speed is increased

turn to the left hand side = speed is reduced

After setting, secure valve with counter nut and cover with dust cap (Fig. 8.2/1).

On tractors with a controllable hydraulic pump (Fig. 8.6/5) the necessary oil volume should be set on the current regulating valve of the tractor and the pressure limiting valve (Fig. 8.6/3) should be set in such a way that the oil volume is as little as possible. For this close the pressure limiting valve (Fig. 8.2 or Fig. 8.6/3) (turn to the right hand side) and then open by 1/2 turn. Larger oil volumes than necessary are returned into the oil tank by the pressure limiting valve and would result in an unnecessary heating up of the hydraulic oil.

	AD-P / AD-PL FRS / FPS AIRSTAR Xact	
	3,0 m	2800
	4,0 m	3000
	4,5 m	3000
	6,0 m	3200
	6,0 m	3900
Working width		Blower fan speeds (R.P.M.)
		Fine seeds (Rape) Legumes (grain)

t170gb05

Fig. 8.1

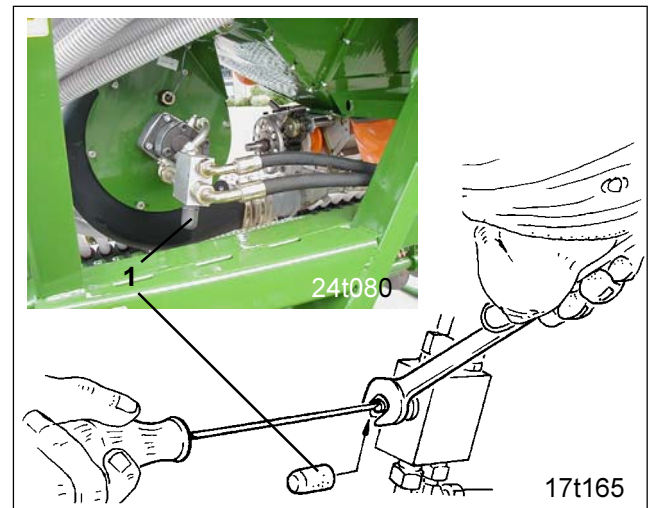


Fig. 8.2

The blower fan speed is changing until the hydraulic oil has reached its operational temperature. At the first use the blower fan speed should be corrected until the operational temperature of the hydraulic oil has been reached. If the blower fan is used after a prolonged period of standstill, the reset blower fan speed will only be reached after the hydraulic oil has reached the operational temperature.

8.2 Speed monitoring

The speed of the blower fan can be monitored by the electr. controlling and regulating system AMADOS/AMALOG.

Press

key



to display the actual speed of the blower fan provided with a speed sensor (Fig. 8.3/1).

If the rated speed deviates by more than 10 % an audible signal sounds and the black triangle (Fig. 8.4) above the speed symbol flicks.



Enter the rated speed as described in the instruction manual for AMADOS/AMALOG.



The alarm is only released when AMADOS/AMALOG receives impulses from the distance sensor (Fig. 8.5/1).



Fig. 8.3

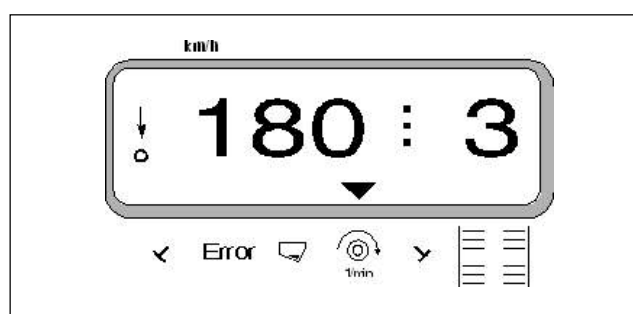


Fig. 8.4



Fig. 8.5

8.3 Circuit diagram blower fan with hydraulic drive

No	Description
1	Blower fan hydrostatic motor $N_{\max.} = 4000$ R.P.M.
2	DBV-valve with hydr. free wheel
3	Adjustable pressure relief valve
4	Check valve
5	Tractor hydraulic pump required capacity: minimum 40 l/min. at 150 bar
6	Free return flow - tube nominal width min. Ø16 mm - use couplings with sufficiently large diameter - the back pressure in the return flow may be in maximum 10 bar.
7	Filter
8	Single or double acting control spool valve with priority
9	Hydraulic oil tank
10	Plug coupling
11	Plug coupling "large"

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Do not create other connections than shown in this circuit diagram (Fig. 8.6).

8.3.1 Explanations for the circuit diagram

On the pressure side the blower fan hydrostatic motor (Fig. 8.6/1) can be connected with either a single or a double acting control spool valve (Fig. 8.6/8) with priority control.

In order not to damage the hydrostatic motor, the oil pressure in the return flow (Fig. 8.6/6) must not exceed 10 bar. Therefore, never connect the return flow with the control spool valve (Fig. 8.6/8) but with a pressure free return valve with a large plug coupling (Fig. 8.6/11). Should it become necessary to install a new return flow tubing, only use DN16, e.g. Ø20 x 2,0 mm and short return flow ways.

The hydraulic oil must be guided through an oil filter (Fig. 8.6/7) at any place of choice.

The returning hydraulic oil must never be guided through control spool valves as the oil pressure would hereby exceed the maximum pressure of 10 bar.

The check valve (Fig. 8.6/4) allows the blower fan to run after as soon as the control spool valve (Fig. 8.6/8) has been shut off.

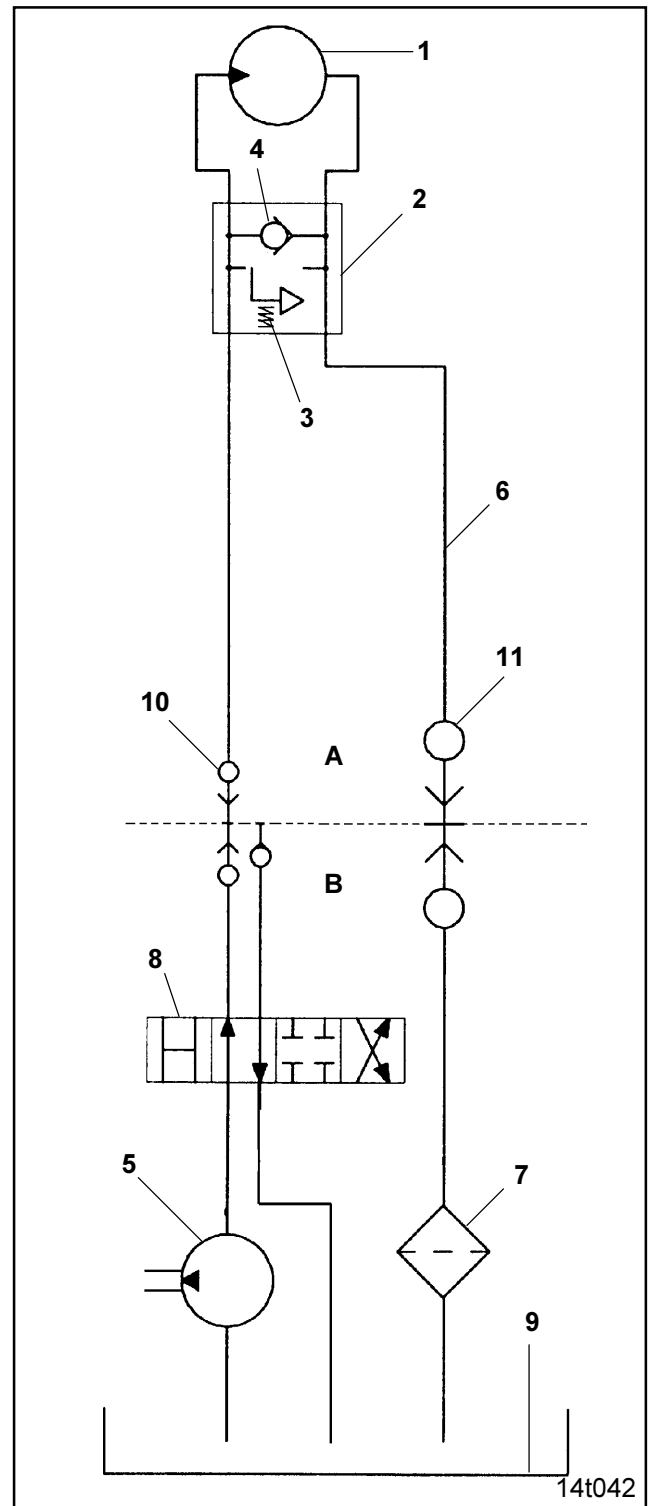


Fig. 8.6

The hydraulic oil must not heat up too much. If large amounts of oil are fed into small oil tanks, the hydraulic oil will heat up. The capacity of the oil tank (Fig. 8.6/9) should at least have the double of the oil delivery amount. If the oil heats up too much, the installation of an oil cooler on the tractor by a professional workshop is necessary.

Particles of dirt may damage the blower fan hydrostatic motor (Fig. 8.6/1) and the pressure limiting valve (Fig. 8.6/3). For this reason, always keep clean the coupling parts when connecting the blower fan hydrostatic motor to the tractor's hydraulics to avoid the hydraulic oil becoming dirty.

Should it be necessary to drive besides of the blower fan hydrostatic motor yet another hydrostatic motor, both motors should be switched parallel. When switching both motors in line the maximum permissible oil pressure of 10 bar will be always exceeded behind the first motor.

If the blower fan hydrostatic motor has to be connected to different tractors, ensure that the type of oil in the hydraulic circuits is compatible. Impermissible mixing of various hydraulic oils may lead to defects on hydraulic components.

9.0 Seed box filling and emptying



Before filling the seed box couple the seed drill to the soil tillage implement.



First empty the seed box before uncoupling the seed drill

9.1 Filling the seed box

The seed box can be filled from the loading platform (Fig. 9.2), with a shovel loader or with big bags.

For filling the seed box from the loading platform the railing (Fig. 9.2/1) can be fixed at random to the right hand or left hand side.

The seed box can be rain proof covered with the folding cover canvass (Fig. 9.1) The folding cover canvass is secured with rubber strips (Fig. 9.3/1).



**Refill seed box early enough.
Never drive the drill until the seed box is completely empty.**



Fig. 9.1



Fig. 9.2



Fig. 9.3

9.2 Emptying the seed box



It is of great importance that the seed box and the seed metering wheels are cleaned after having finished operation. If the seed metering wheels are not emptied completely, even there seed residue swells and germinates. A blockage of the seed metering wheels would be the result causing damage to drive or gearbox.

For emptying the seed box tyke the calibration tray (Fig. 9.4/1) in your hands. The calibration tray is fitted with a retainer on the seed box and secured with a clip pin (Fig. 9.4/2).

Place the calibration try (Fig. 9.5/1) underneath the metering unit.

Push downwards lever (Fig. 9.5/2) and arrest. With the lever the outlet behind the metering unit is opened.

Open the outlet as long as the calibration tray has been filled with seed. Empty the calibration tray and repeat this procedure as long as no seed will flow from the outlet into the calibration tray.

For a complete emptying open the injector sluice (Fig. 9.6/1).

For emptying the metering wheels, drive the metering wheels by the calibration crank in the same way as mentioned for determining the gearbox setting lever position.

Then let the blower fan briefly run to remove any residue of seed.

Close outlets and place the calibration tray to the seed box again.

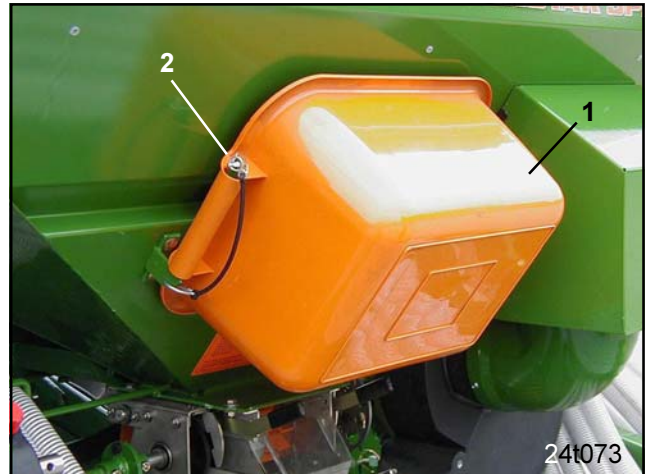


Fig. 9.4

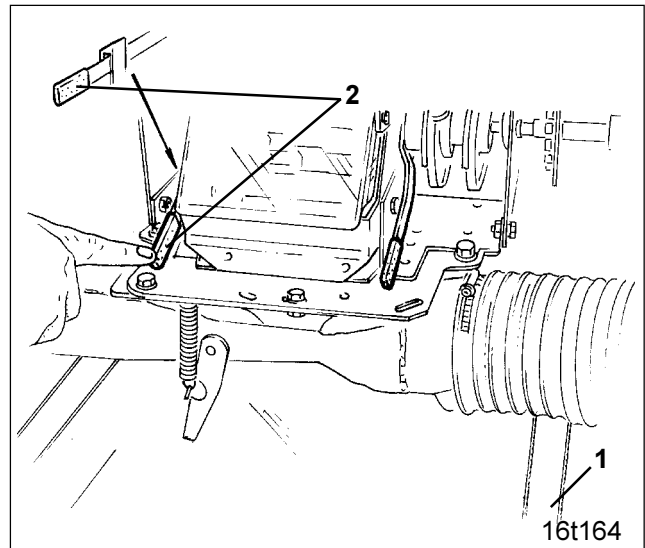


Fig. 9.5



Fig. 9.6

10.0 Setting the metering unit to a particular seed

Every metering unit is provided with

- a white coloured main seed wheel (Fig. 10.1/1)
- an orange coloured main seed wheel (Fig. 10.1/2)
- a red/black coloured fine seed wheel (10.1/3).

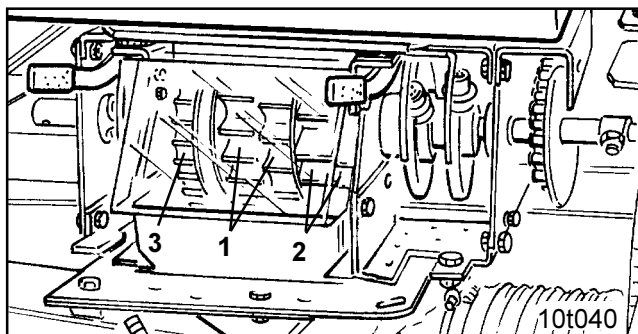


Fig. 10.1



When the table indicates: "Main seed wheels" ("Hauptsäräder") (see Tab. Fig. 10.2) always sow with both main seed wheels at the same time.



* The required metering wheel(s) may be taken from the table (Fig. 10.2).

For seeds which have not been mentioned in the table (Fig. 10.2) please refer to a seed with similar grain size when choosing the seed wheel.



** Blower fans with belt drive are equipped with a throttle flap. Please take the correct throttle flap position from table (Fig. 10.2) and adjust the throttle flap according to para. 7.3.



For blower fans with hydraulic drive, please take the blower fan speed from the table (Fig. 8.1).

Seed	Metering wheel*	Throttle-flap-position**
Beans	Main seed wheels	open
Dinkle	Main seed wheels	open
Peas	Main seed wheels	open
Flax (dressed)	Main seed wheels	open
Grass seed	Main seed wheels	open
Oats	Main seed wheels	open
Millet	Main seed wheels	open
Lupine	Main seed wheels	open
Lucerne	Main seed wheels	open
Lucerne < 20kg/ha	Fine seed wheel	closed
Oil linnen (dressed moist)	Main seed wheels	open
Oil linnen (dressed moist) < 20kg/ha	Fine seed wheel	closed
Öl radish	Main seed wheels	open
Oil radish < 20kg/ha	Fine seed wheel	closed
Phacelia	Main seed wheels	open
Phacelia < 20kg/ha	Fine seed wheel	closed
Rye	Fine seed wheel	closed
Rye	Main seed wheels	open
Red clover	Fine seed wheel	closed
Mustard	Fine seed wheel	closed
Soya	Main seed wheels	open
Summer barley	Main seed wheels	open
Sun flowers	Main seed wheels	open
Late turnip	Fine seed wheel	closed
Wheat	Main seed wheels	open
Vetches	Main seed wheels	open
Winter barley	Main seed wheels	open

Fig. 10.2

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10.1 Switching the metering wheels on and off

In the position **“metering wheel on”** (“Särad ein”) the knurled bolt (Fig. 10.3/1) is driven in till the stop.

In the position **metering wheel off** (“Särad aus”) the knurled bolt (Fig. 10.4/1) is driven out till the stop (Fig. 10.4/2).



Drive the knurled bolts either in position **“metering wheel on”** (“Särad ein”) or **“metering wheel off”** (“Särad aus”).
Never tighten knurled bolts too firmly or drive them too tightly to the stop (Fig. 10.4/2).

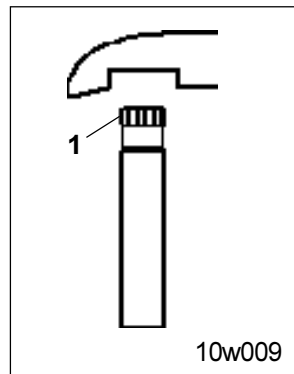


Fig. 10.3

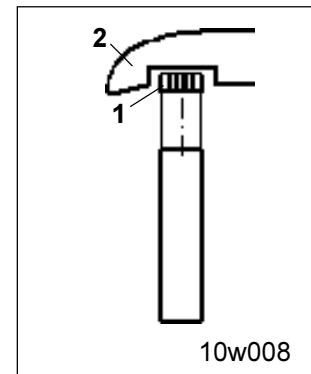


Fig. 10.4

10.2 Sowing with both main metering wheels

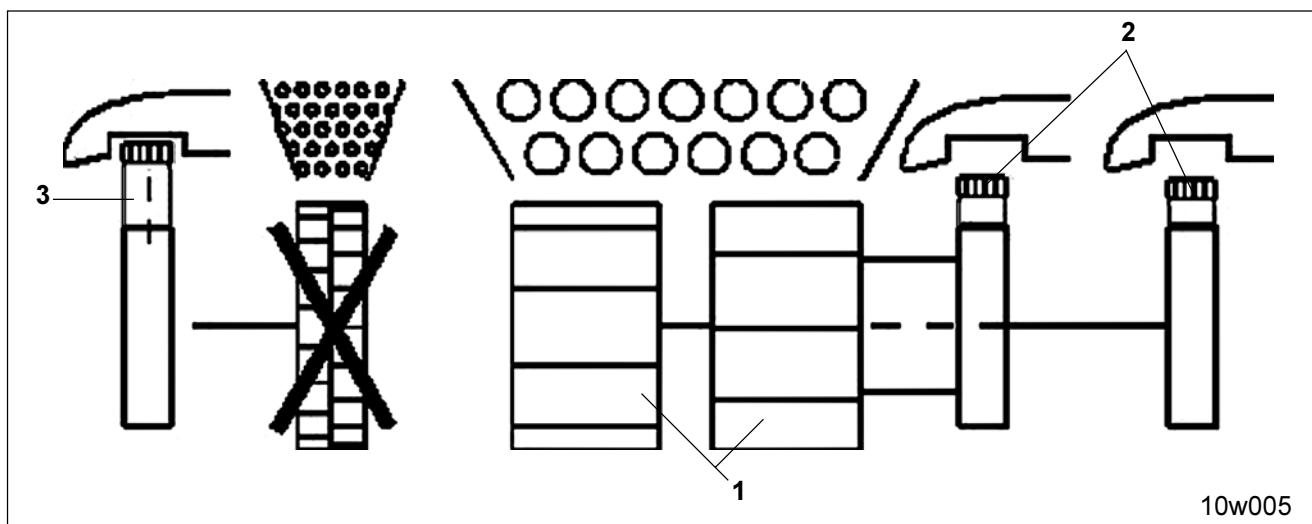


Fig. 10.5

For sowing with both metering wheels (Fig. 10.5/1)

- turn the hand wheel (Fig. 10.7/1) until the knurled bolts (Fig. 10.7/2) can be seen
- drive in knurled bolts (Fig. 10.5/2) of the main metering wheels
- Drive out the knurled bolt (Fig. 10.5/3) of the fine seed metering wheel.

10.3 Sowing with the fine seed metering wheel

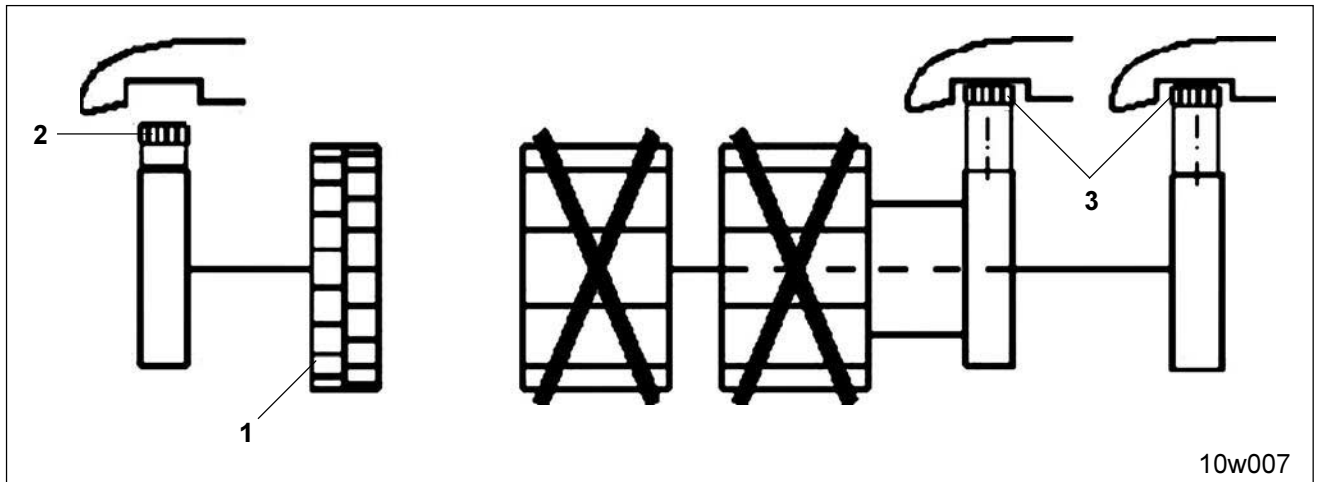


Fig. 10.6

When sowing with the fine seed metering wheel (Fig. 10.6/1)

- turn hand wheel (Fig. 10.7/1) until the knurled bolts (Fig. 10.7/2) can be seen
- drive in knurled bolt (Fig. 10.6/2) of the fine seed metering wheel
- drive out knurled bolts (Fig. 10.6/3) of both main seed metering wheels.

10.4 Shear off safety

In order to avoid damage on driving components in case of blockage of the seed wheels, the connection of drive and metering unit is protected by a shear off safety bolt.

In case of blockage of the seed wheels a plastic bolt (Fig. 10.8/1) shears off and the power supply to the metering unit is interrupted. After removal of the blockage and replacement of the shear off bolt, the machine is ready for operation again. You will find 5 replacement shear off bolts (Fig. 10.8/2) in a retainer above the hand wheel.



For a faultless function only use a plastic shear off bolt M8 (Order No. 917420) verwenden.

In case of a standstill of the metering wheels during operation a warning is given on the AMADOS/AMALOG display. The warning is released by a sensor which monitors the movement of the metering wheels.

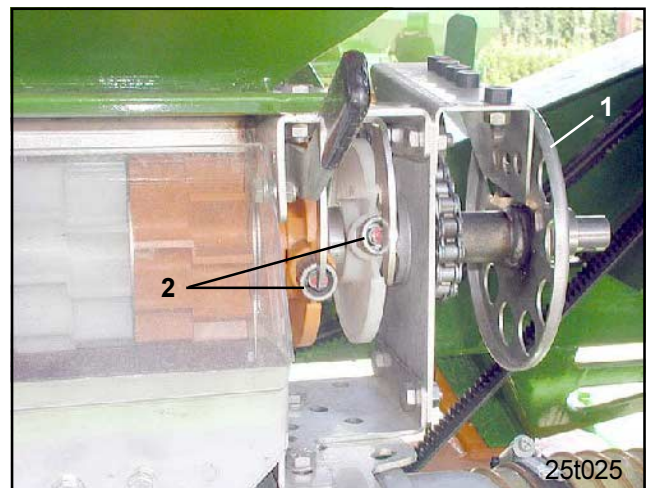


Fig. 10.7

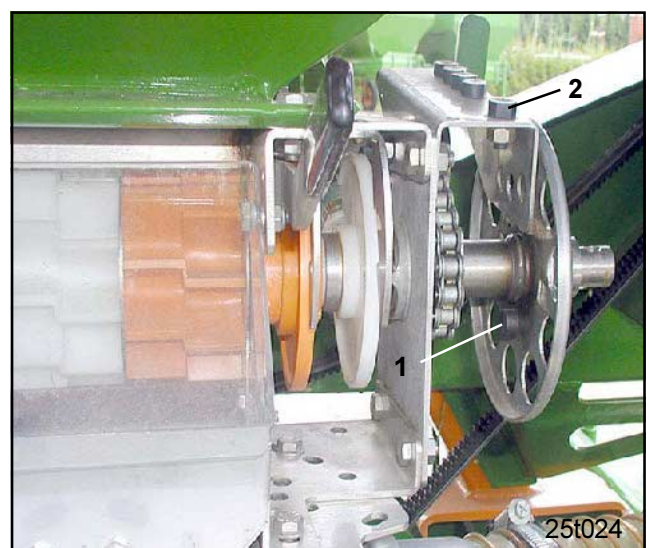


Fig. 10.8

11.0 Determining the gearbox setting for the desired seed rate

Set the metering unit according to para. 10.0.

Fill the seed box with seed to at least 1/4 of its capacity.

Set the desired seed rate on the gearbox (Fig. 11.1/1).

By the gearbox setting lever (Fig. 11.1/2) the speed of the metering shaft and thus the seed rate can be set infinitely variably. The higher the figure on the scale (Fig. 11.1/3) has been chosen by the gearbox setting lever, the higher the seed rate will get.



After every setting on the gearbox setting lever a calibration test should be conducted to confirm that at the later sowing the desired seed rate will be obtained.

This check should also be conducted

- when changing to another seed wheel, e.g. from the main seed wheels to the fine seed wheel.
- before sowing a new supply of seed (reason: deviations in grain size, grain shape, bulk density and seed dressings).



In case the desired seed rate is not achieved with gearbox position 100, interchange the chain wheel pair (Fig. 11.2/1). Then higher seed rates will be possible.

When sowing fine seeds always choose the smaller gear ratio as shown in figure (Fig. 11.2).

Only remove the chain guard (Fig. 11.3) when carrying out fittings. Never ever operate the machine without chain guard.

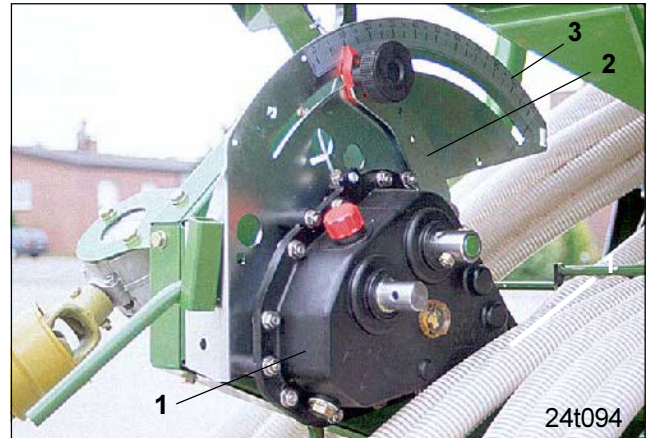


Fig. 11.1



Fig. 11.2



Fig. 11.3

Place the calibration tray (Fig. 11.4) below the metering unit.

The calibration tray (Fig. 11.5/1) is fixed in a retainer to the seed box and secured by a clip pin (Fig. 11.5/2).

Open the injector sluice flap (Fig. 11.4/1).

Slacken the star knob (Fig. 11.6/1) of the gearbox setting lever.

Slide the gearbox setting lever (Fig. 11.6/2) to the following gearbox setting:

**Sowing with both main seed wheels:
gearbox setting "50"**

**Sowing with the fine seed wheel:
gearbox setting "15"**

Firmly tighten star knob (Fig. 11.6/1).



Fig. 11.4



Fig. 11.5

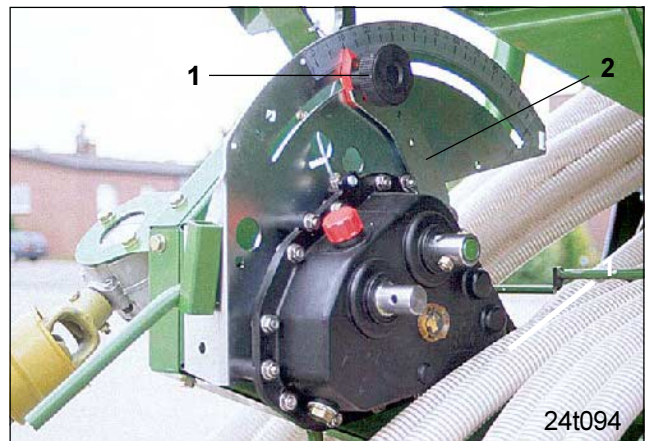


Fig. 11.6

11.1 Calibration test

Take the calibration crank in your hand. You will find the calibration crank (Fig. 11.7/1) in a retainer next to the variogearbox.

Insert the calibration crank (Fig. 11.8/1) into the take-up of the star wheel and turn the crank to the **left** until the/ all metering wheel housing(s) has/have been filled with seed and a uniform flow of seed runs into the calibration tray. Empty the contents of the calibration tray into the seed box and turn the crank to the **left** in number of turns taken from the table (Fig. 11.9).



Fig. 11.7



Fig. 11.8

The number of crank turns (Fig. 11.9) depends on the working width of your seed drill.

The number of crank turns refers to an area of 1/40ha (250m²) or 1/10ha (1000m²).

Common is the crank turn for 1/40 ha. In case of very small seed rates, e.g. for rape or when using balances with coarse scales, it is recommended to conduct the crank turn for 1/10 ha.

Weight the seed collected in the calibration tray (Fig. 11.10/1) (consider the bucket own weight) and multiply

- by factor "40" (at 1/40ha) or
- by factor "10" (at 1/10ha).

Calibrating for 1/40 ha:

Seed rate [kg/ha] = collected seed [kg/ha] x 40

Calibrating for 1/10 ha:

seed rate [kg/ha] = collected seed [kg/ha] x 10

Example:

Calibrating for 1/40 ha
collected seed 3,2 kg

Seed rate [kg/ha] = 3,2 [kg] x 40 [/ha]
= 128 [kg/ha]



Calculation disc rule

The desired seed rate usually is not obtained after the first calibration test. However, with the aid of the disc rule according to para. 11.2 it is possible to determine the correct gearbox setting by using the gearbox setting figure of the first calibration test at the calculated seed rate.

- Recheck the gearbox setting which you have determined with the aid of the disc rule with a calibration test as described in para. 11.1.

After you have determined the correct gearbox setting

- insert the calibration crank (Fig. 11.7/1) into its container
- Close injector sluice flap (Fig. 11.4/1), fit calibration tray to the seed box and secure with a clip pin.


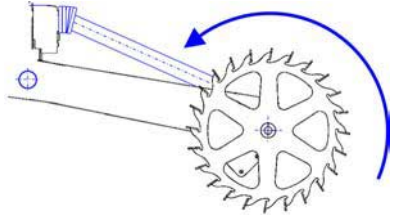
 956268		
	1/40 ha	1/10 ha
3,0 m	38,5	154,0
4,0 m	29,0	117,0
4,5 m	26,0	104,0
6,0 m	19,5	78,0

Fig. 11.9



Fig. 11.10

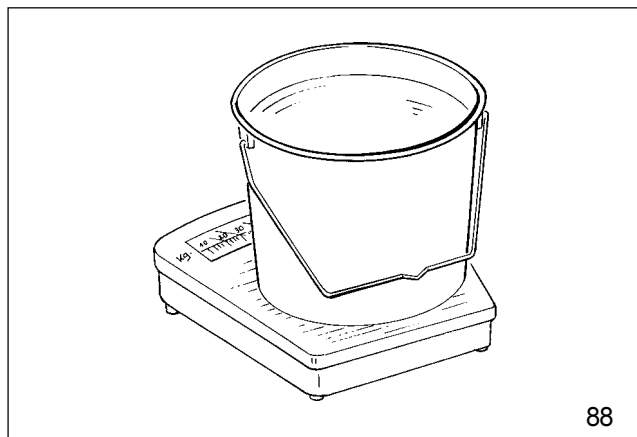


Fig. 11.11

11.2 Determining the gearbox setting with the aid of the disc rule

The desired seed rate usually is not obtained after the first calibration test. However, with the aid of the disc rule it is possible to determine the correct gearbox setting by using the gearbox setting figure of the first calibration test at the calculated seed rate.

The disc rule consists of three scales: an outer white scale (Fig. 11.12/1) for all seed rates above 30 kg/ha and an inner white scale (Fig. 11.12/2) for all seed rates of less than 30 kg/ha. On the centre coloured scale (Fig. 11.12/3) the gearbox settings from "1 to 100" are indicated.

Example:

Desired seed rate: 125 kg/ha.

- At the first setting the gearbox setting lever is moved to the gearbox position "70" (you may as well choose any other gearbox setting figure). In this case a seed rate of 175 kg/ha has been calculated.
- Align the seed rate 175 kg/ha (Fig. 11.12/A) and the gearbox setting figure "70" (Fig. 11.12/B) on the disc rule.
- Now read off the disc rule the gearbox setting lever for the desired seed rate of 125 kg/ha (Fig. 11.12/C). In our example that is the gearbox setting figure "50" (Fig. 11.12/D).
- Recheck the gearbox setting which you have determined by the disc rule by a calibration test as described in para. 11.1.

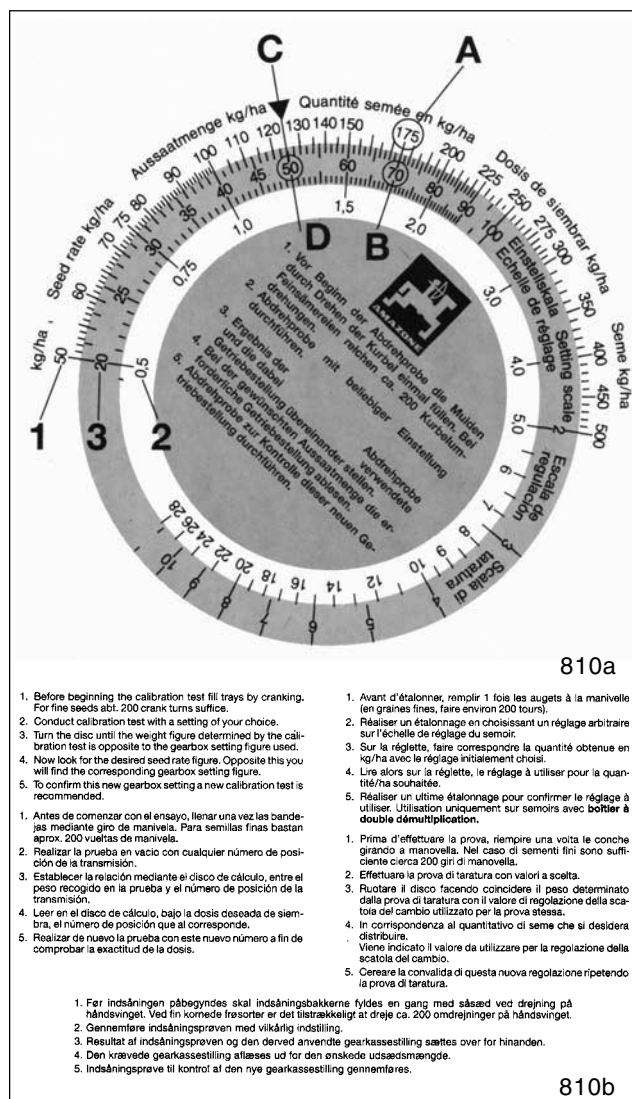


Fig. 11.12



11.3 Seed rate deviations between the setting and the sowing

To avoid deviations between the setting of the seed rate and the later sowing and to achieve a uniform distribution of the seed to all coulters, please note the following hints:

When sowing dressed seeds

The distributor head should regularly be checked and cleaned.

In case of wheel slip

the drive wheel for the metering units turns on very light and loose soils less than at the same distance on very firm cloddy soils. In case of high wheel slippage the number of crank turns for determining the gearbox setting should be newly determined.

For this measure out in the field an area of 250 m². This corresponds to a machine with:

3,00 m working width	=	83,3 m travelled distance
4,00 m working width	=	62,5 m travelled distance
4,50 m working width	=	55,5 m travelled distance
6,00 m working width	=	41,7 m travelled distance

The number of crank turns is then counted when travelling the measured distance. With this number of crank turns then gearbox setting should be determined according to para. 11.0.

12.0 Track marker

The seed drill is equipped with two track markers (Fig. 12.1) for marking a trace in the soil in line with the tractor's centre. After turning at the headlands the tractor follows the centrally marked trace when travelling the next bout.

The trace is marked during sowing from one marker disc (Fig. 12.1/1).

After turning at the headlands one marker (Fig. 12.2) is lifted up into a vertical position and the opposite marker drops down and begins to operate.

Connect the hydraulic rams of the track marker to a single acting control spool valve.



When the control spool valve is actuated danger of injury from moving parts. Before actuating the tractor control spool valve advise people to leave the danger zone. It is prohibited to stay within the working area of the marker arms.

When the seed drill is operated in combination with an AMAZONE rotary cultivator/rotary harrow the track markers (Fig. 12.2) are fixed on the soil tillage implement. When the seed drill is operated with a soil tillage implement of another manufacturer the track markers (Fig. 12.3) are fixed on the AD-P Special.



Fig. 12.1



Fig. 12.2



Fig. 12.3

12.1 Bring markers into operating or transport position

For transport, i.e. immediately after work, each marker arm (Fig. 12.4/2) is fixed with a pin (Fig. 12.4/1 or Fig. 12.5/1) and secured by using a clip pin (Fig. 12.6).

Figure (Fig. 12.4) illustrates how to insert the pin on the marker arm which is fitted to a rotary cultivator/rotary harrow. Figure (Fig. 12.5) illustrates how to insert the pin on a marker arm which is fixed on a Pack Top seed drill.



Danger of injury

After removal of the pin (Fig. 12.4/1 or Fig. 12.5/1) the marker arm moves out slightly to the side.



Fig. 12.4



Fig. 12.5



Fig. 12.6

Insert the pin in parking position (see Fig. 12.7 or Fig. 12.8) immediately prior to the operation in the field and secure using a clip pin.

Figure (Fig. 12.7) illustrates how to insert the pin on the marker arm which is fixed to a rotary cultivator/rotary harrow. Figure (Fig. 12.8) illustrates how to insert the pin on the marker arm which is fixed on a Pack Top seed drill.



Ask people to leave the danger area and bring the marker arms to operating position by actuating the tractor control spool valve inside the tractor cab.

When the tractor control spool valve is pressurised, both markers (Fig. 12.2) are lifted:

1. for transport (only with pin securing)
2. before turning on the headlands
3. when passing an obstacle in the field.

When the tractor control spool valve is brought into the "float" position, one of the markers (Fig. 12.1) will be lowering:

1. when starting to operate
2. after turning at the headlands.



Before transport of a seed drill, e.g. immediately after work, secure the marker arms by using pins and secure with clip pins (see para. 12.1)!



The rubber buffer blocks (Fig. 12.7/1) must never be removed and in case of wear must be replaced.

The buffer blocks prevent the operator from forgetting to lock the markers into the transport position after work. In case the marker arms would not be secured with pin and clip pin as described in para. 12.1 they would not be in a totally vertical position and the 3 m transport width would be exceeded.



Fig. 12.7



Fig. 12.8

12.2 Setting the marker arms to the correct length

The seed drill is equipped with markers for marking a trace in the soil in line with the tractor's centre.

The distance is measured either from the machine's centre or from the outer sowing coulters (see Fig. 12.10).

The spacing "A" (Fig. 12.10)

	AD-P 303 Special		
	spacing "A"		
24 rows, 12,5 cm row spacing	300,0 cm		

t2013gb01

The spacing "B" (Fig. 12.10)

	AD-P 303 Special		
	spacing "B"		
24 rows, 12,5 cm row spacing	156,0 cm		

t2013gb02

Prior to adjusting the marker discs (Fig. 12.11) slacken the two hex. bolts (Fig. 12.11/1). The discs can then be moved in the marker arms. Retighten the bolts firmly after adjustment.



Always set the marker discs (Fig. 12.11) in such a way that on light soils they are about parallel with the direction of operation and on heavy soils they are angled more aggressively "on grip".



Fig. 12.9

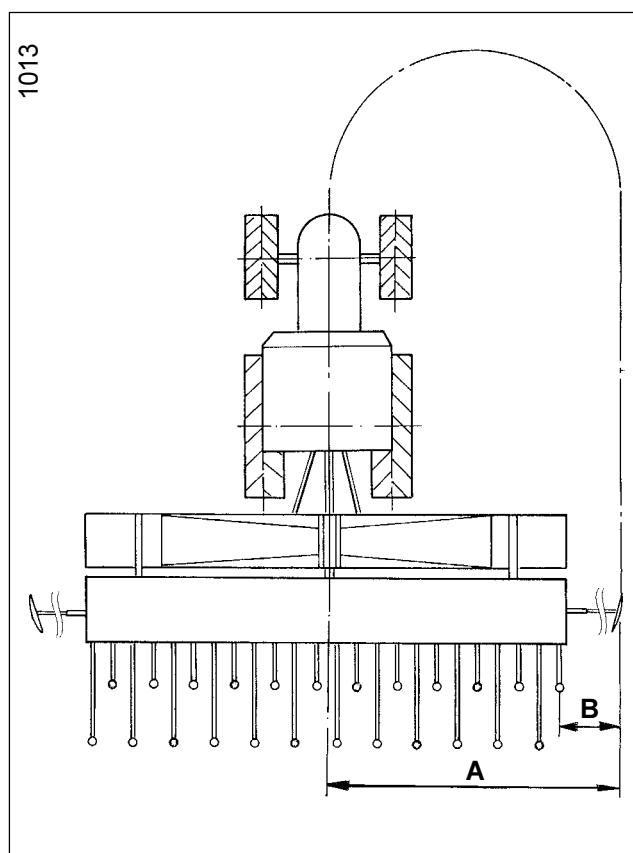


Fig. 12.10

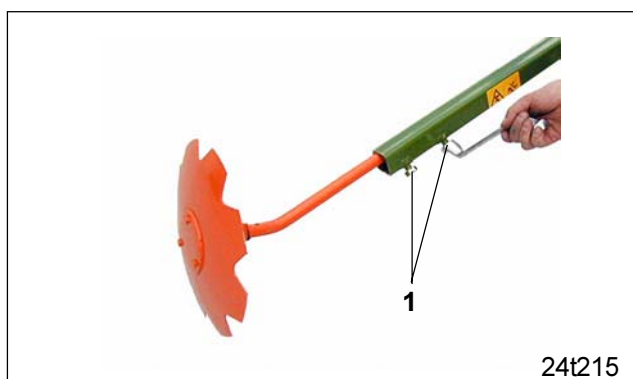


Fig. 12.11

12.3 Obstacles in the field

To avoid damage, the markers should be raised before hitting an obstacle in the field. Lower the marker down again after the obstacle has been passed. However, the two markers are linked in rhythm, so when actuating the tractor control spool valve, the opposite marker is lowered.

Apply pressure again to the tractor control spool valve. As soon as both markers are raised, bring the control spool valve to the "float" position so that the correct marker is lowered.



To avoid that the AMADOS/AMALOG computer shifts forward the tramline control (if existing), press the "stop key" (see AMADOS/AMALOG instruction manual) before lifting the marker arms.



Fig 12.12

12.4 Shear bolt safety

If the marker hits an obstacle during operation, the marker arm gives way to the obstacle by moving to the rear. In this case a hex. bolt M6 x 90, 8.8 DIN 931 (Fig. 12.12/1) will shear off.

13.0 Setting the placement depth of the seed

One of the most important preconditions for high yields is maintaining a constant placement depth of the seed.

The placement depth depends on coulter pressure, forward speed and soil condition. Your seed drill is equipped as standard with a central coulter pressure adjustment which applies an even pressure to all coulters.



Check the seed placement depth always:

- before starting to drill
- after every coulter pressure adjustment
- after re-adjustment of the RoTeC depth limiting discs
- when changing the forward speed
- in changing soil conditions.

Travel with your seed drill in the field approx. 30 m at operational speed, check the placement depth of the seed and readjust if necessary.

The central coulter pressure adjustment can either be carried out by an adjustment spindle (Fig. 13.1) or a hydraulic ram (Fig. 13.6, option).

With the aid of the hydraulic ram the coulter pressure can be adjusted to suit the soil conditions during operation. If the soil is changing from normal to heavy or vice versa, the coulter pressure setting can be varied.



Fig. 13.1

13.1 Setting the placement depth of the seed by the adjustment spindle

The coulter pressure and thus the placement depth of the seed is increased by turning the spindle (Fig. 13.3/1) clockwise, by turning it counter clockwise it is reduced.

For actuating the adjustment spindle (Fig. 13.3/1) the crank (Fig. 13.3/2) has to be plugged onto the adjustment spindle. The crank (Fig. 13.4/1) is placed in a retainer on the left hand frame part.

If the RoTeC-coulters (option) are equipped with depth limiters (option) and if the desired placement depth cannot be achieved by turning the adjustment spindle (Fig. 13.3/1), then all RoTeC disc coulters depth limiters can be readjusted according to para. 13.3.1.

The fine adjustment then is again conducted by the adjustment spindle.

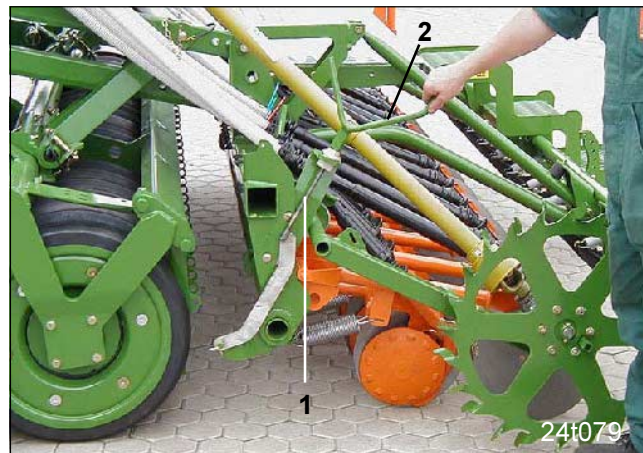


Fig. 13.3



Fig. 13.4

13.2 Setting the placement depth of the seed by a hydraulic ram (special option)

The coulter pressure and thus the placement depth can centrally be set by a hydraulic ram (Fig. 13.6). During the operation the coulter pressure can be increased in areas with heavier soil.

Connect the hydraulic ram (Fig. 13.7/1) to a single acting tractor control spool valve and actuate the control valve only from the tractor cab.



The hydraulic coulter pressure adjustment is coupled with the hydraulic extra coverage following harrow adjustment (option). If the coulter pressure is increased, the extra coverage following harrow pressure will be increased automatically.



Observe the safety advice in para. 3.6.4. When actuating the control spool valve the hydraulic rams of the coulter pressure adjustment and the extra coverage following harrow pressure adjustment are pressurised at the same time. Advise persons to leave the danger area. Danger of injury from moving parts.

Two pins (Fig. 13.7/3 and Fig. 13.7/4) function as stroke limiters for the stroke of the hydraulic ram (Fig. 13.7/1) placed within the setting segment. When the hydraulic ram is without pressure the ram is closed onto the lower pin. Conversely, when pressure is applied to the ram it will stop at the position of the pin (Fig. 13.7/4).

Setting the normal coulter pressure

- Pressurise the hydraulic ram (Fig. 13.7/1).
- Insert the pin (Fig. 13.7/3) into one of the holes of the quadrant plate below the ram guidance and secure by using a clip pin (Fig. 13.7/2).

Each hole of the quadrant plate is marked with a figure. An increasing figure indicates an increase in the coulter pressure.

Increasing the coulter pressure

- Relieve the hydraulic ram (Fig. 13.8/1) from pressure.
- Insert the pin (Fig. 13.8/3) in one of the holes of the quadrant plate and secure by using a clip pin (Fig. 13.8/2).

Each hole of the quadrant plate is marked with a figure. An increasing figure indicates an increase in the coulter pressure.



Fig. 13.6

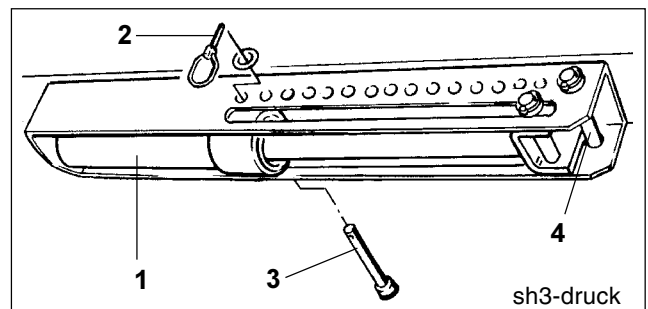


Fig. 13.7

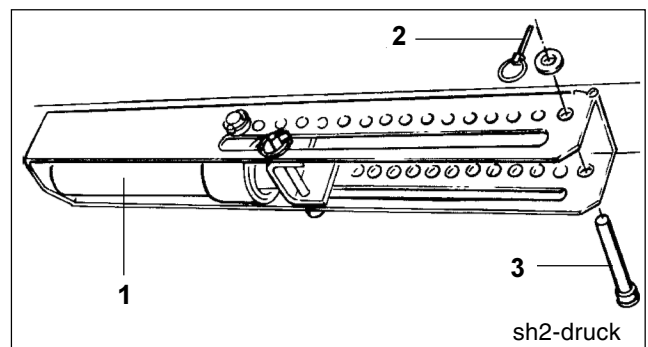


Fig. 13.8

Seed drills with RoTeC-disc coulters

When your seed drill is equipped with RoTeC-disc coulters and depth limiters (special option) and the desired placement depth cannot be achieved by replacing the pin, all RoTeC depth limiter discs would have to be re-adjusted evenly according to para. 13.3.1.

The fine adjustment then is again conducted by re-inserting the pins

13.3 Setting the placement depth of the seed by resetting the RoTeC depth limiting discs (special option)

To ensure that the seed depth placement will be maintained throughout the field even under changing soil conditions, the RoTeC disc coulters can be equipped with depth limiting discs (Fig. 13.9/1).

When having ordered the seed drill with depth limiting discs they have been set by the factory in position 1 (see. para. 13.3.1) for a placement depth of approx. 2 cm for medium heavy soils. For slightly increasing the placement depth the coulter pressure may be increased with the aid of the coulter pressure adjustment according to para. 13.1 or para. 13.2. Before every operation check the correct position of the depth limiting discs and the placement depth of the seed.

13.3.1 Fitting and setting the RoTeC-depth limiting discs

First fitting

Take the RoTeC-depth limiting disc (Fig. 13.10/1) by its grip (Fig. 13.10/2) and press the depth limiting disc (Fig. 13.11/1) from below against the locking (Fig. 13.11/2) of the RoTeC-coulter. The collar (Fig. 13.10/3) must catch into the detent slit (Fig. 13.11/3). Then pull the grip to the rear. A slight tap on the discs centre facilitates engagement.

For setting the working depth pull the grip upwards (Fig. 13.12) over the locking pawl (Fig. 13.11/4).

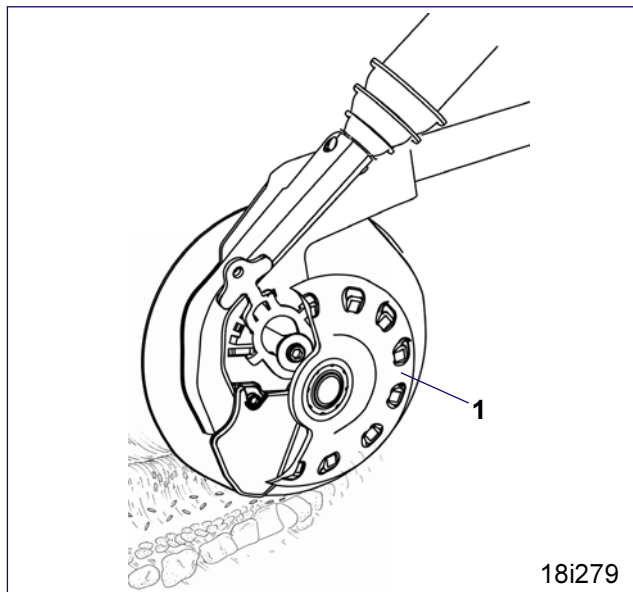


Fig. 13.9



Fig. 13.10

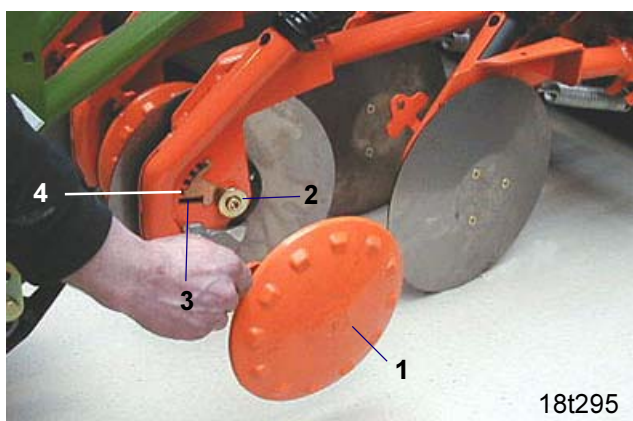


Fig. 13.11

Setting the depth limiters

The RoTeC-limiting disc (Fig. 13.12/1) can be set in 4 positions. For medium soils, the following placement depths (see Fig. 13.13) result:

- Positions 1: placement depth approx. 2cm
- Positions 2: placement depth approx. 3cm
- Positions 3: placement depth approx. 4cm

without-
depth limiting disc: placement depth > 4cm



Check the placement depth of the seed. Slight changes in the placement depth of the seed may then be set with the aid of the coulter pressure adjustment.

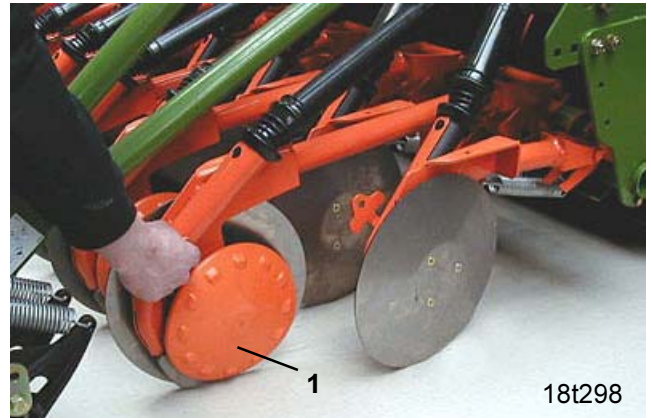


Fig. 13.12

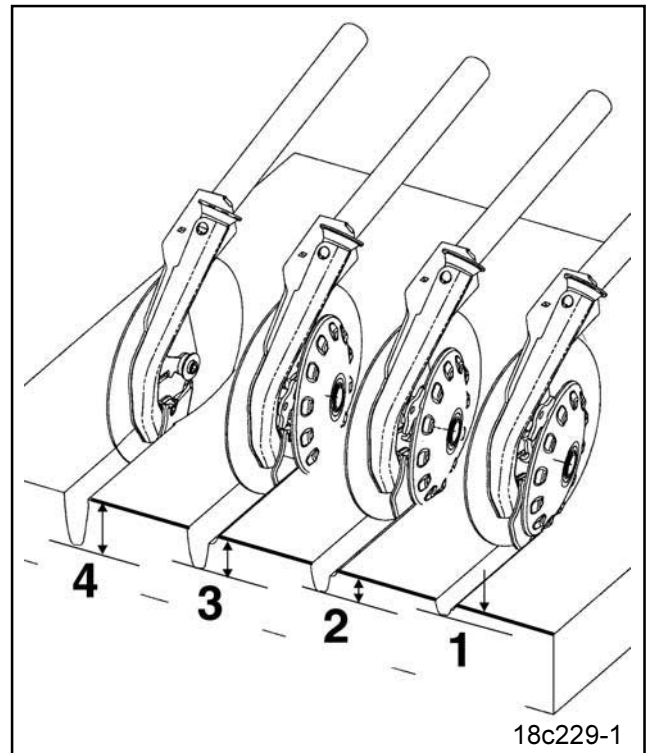


Fig. 13.14

14.0 Extra coverage following harrow (option)

The extra coverage following harrow (Fig. 14.1) evenly covers the seed with soil.

14.1 Mounting the extra coverage following harrow onto the seed drill

- Bolt on the swing metal buffer (Fig. 14.2/1).
- Locate fixing tubes (Fig. 14.2/2) with pins on the fixing brackets of the extra coverage following harrow and on the machine (Fig. 14.3) and secure by using clip pins.

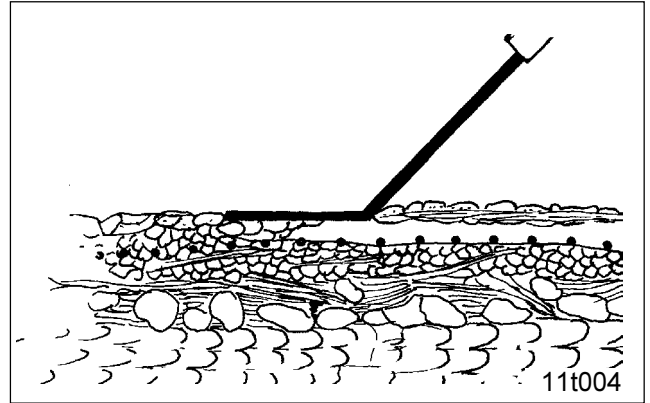


Fig. 14.1

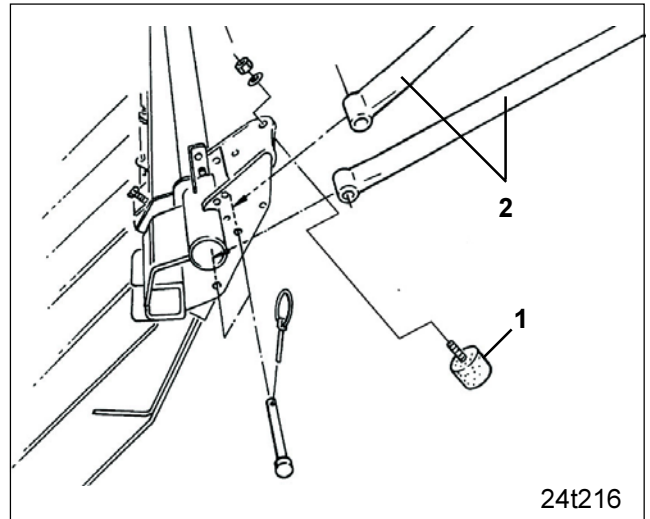


Fig. 14.2



Fig. 14.3

14.1.1 Connecting hydraulic ram (option)

When supplied the hydraulic ram (Fig. 14.4/1) is fitted to the extra coverage following harrow. Connect the hydraulic hose (Fig. 14.4/2) with the hydraulic ram.



Allow the hydraulic hose (Fig. 14.4/2) to have a sufficiently large loop in it when fitting to the pivoting points of the link arm of the extra coverage following harrow to prevent the hose being torn apart by movement of the extra coverage following harrow.

Connect the hydraulic hose (Fig. 14.4/2) together with the hydraulic coulter pressure adjustment (option) and the hydraulic seed rate remote control (option) to a single acting control spool valve and actuate this control spool valve only from the tractor's cab.

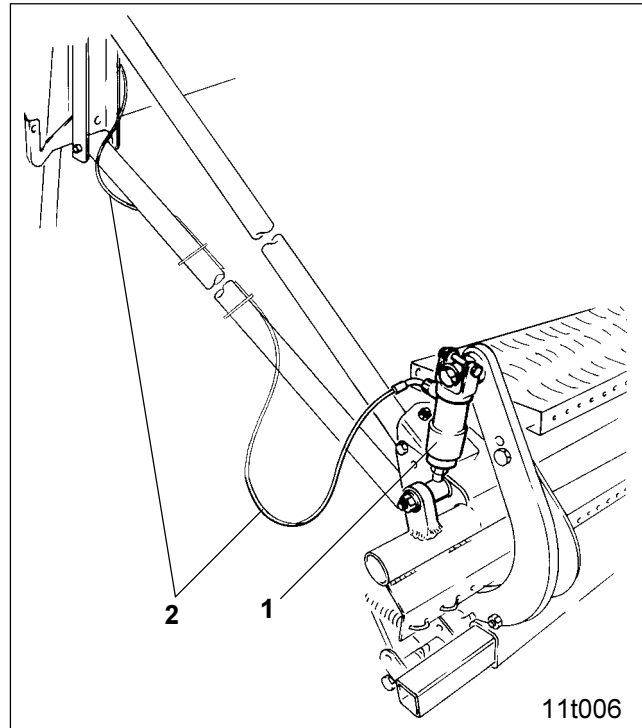


Fig. 14.4



When actuating the control spool valve in the tractor cab, simultaneously the hydraulic rams of the coulter pressure adjustment (option), the pressure adjustment of the extra coverage following harrow (option) and the seed rate remote control (option) are pressurised. Ask people to leave the area of danger. Danger of injury from moving parts.

14.2 Bring out following harrow tines into operating position

During operation the packer roller and the coulters of the seed drill throw the soil in varying different distances to the sides, depending on the forward speed and the soil conditions.

Set the outer following harrow tines (Fig. 14.5/1) in such a way that the soil is guided back again for achieving a mark-free seed-bed.

The higher the forward speed, the more the square tube (Fig. 14.5/2) with the outer harrow tines attached to it have to be moved outwards.

Lock the square tubes with the outer harrow tines into position after every alteration by clamping bolts (Fig. 14.5/3).



Check settings prior to operation. Then travel with the seed drill at operational speed a distance of approx. 30 m in the field.

14.3 Setting the harrow pressure on the extra coverage following harrow without hydraulic ram

The pressure at which the spring tines (Fig. 14.6/1) of the extra coverage following harrow are pressing on to the soil should be set so that after seed coverage no ridge of soil remains visible in the field.

Set the harrow tine pressure as follows:

Pull the stop lever (Fig. 14.6/2) upwards. Insert the pin (Fig. 14.6/3) into a hole below the stop lever (Fig. 14.6/2) and secure by using a clip pin (Fig. 14.6/4). The higher the pin is inserted into the quadrant plate, the higher the pressure of the extra coverage following harrow will be. The stop lever (Fig. 14.6/2) is actuated with the coulter pressure adjustment crank (Fig. 14.6/5).



Check the settings before commencing work.

Travel with your seed drill at operational speed a distance of approx. 30 m in the field to be sown and check whether the seed is evenly covered with soil and no soil ridge remains visible in the field.

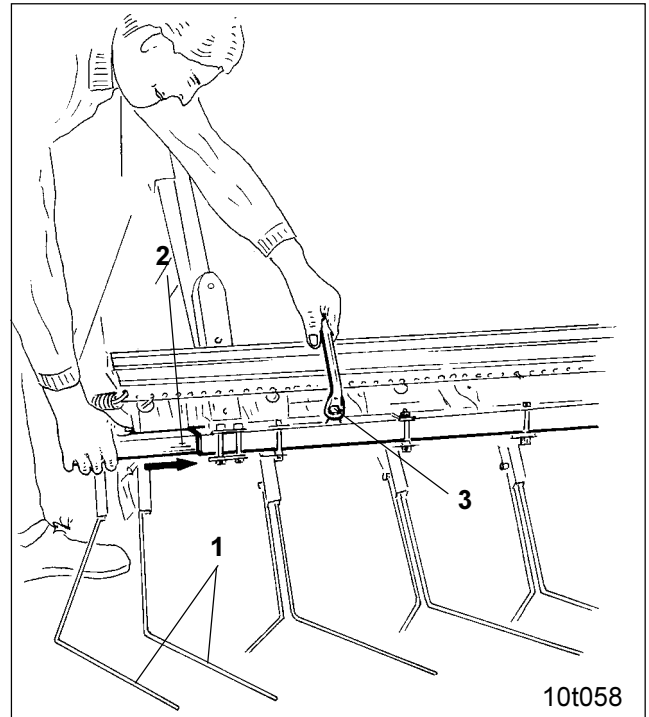


Fig. 14.5

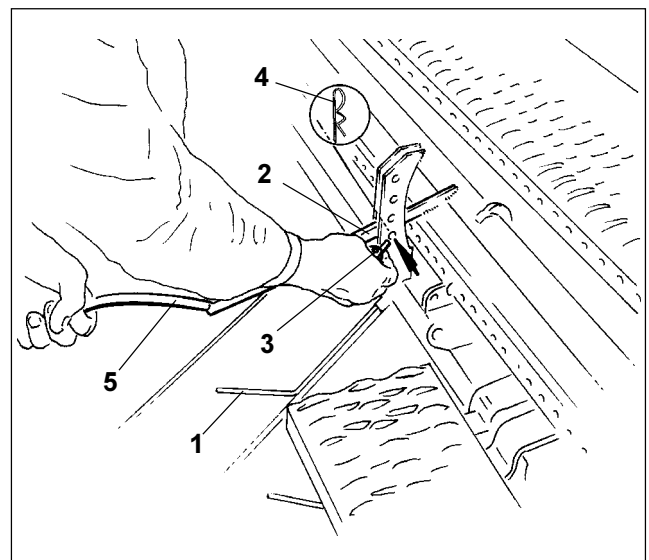


Fig. 14.6

14.4 Setting the harrow tine pressure on the extra coverage following harrow with hydraulic ram

Set the pressure by which the spring tines (Fig. 14.6/1) of the extra coverage following harrow are pressing on to the soil in such a way that after the seed has been covered no ridge remains visible in the field. In fields that have many varying soil types, the harrow pressure can be increased on heavier soil with the aid of the optional hydraulic extra coverage following harrow pressure adjustment.

When changing from normal to heavy soil or vice versa, the coulter pressure is readjusted by a hydraulic ram (Fig. 14.7/1).

Two pins (Fig. 14.8/1 and Fig. 14.8/2) are placed as a stop for the lever (Fig. 14.8/3) in the setting segment. The lever (Fig. 14.8/3) which is actuated by the hydraulic ram (Fig. 14.7/1) rest on the pin I (Fig. 14.8/1) when the hydraulic ram is without pressure and it stops on pin II (Fig. 14.8/2) when the hydraulic ram has been pressurised.

For setting the normal harrow pressure

- Pressurise hydraulic ram (Fig. 14.7/1).
- Insert pin I (Fig. 14.8/1) into a hole in the setting segment below the lever (Fig. 14.8/3) and secure by using a clip pin (Fig. 14.8/4).

For setting the increased harrow pressure

- Relieve the hydraulic ram (Fig. 14.7/1) from pressure.
- Insert pin II (Fig. 14.8/2) into a hole **above** the lever (Fig. 14.8/3) in the setting segment and secure by using a clip pin (Fig. 14.8/4).



The higher you insert a pin into the hole segment, the higher the harrow pressure will get.



Checking settings prior to operation

Travel with your seed drill a distance in the field of approx. 30 m with the later intended operational speed and check whether the seed on light to medium soils is covered with a normal harrow pressure and on heavy soils with increased pressure evenly with soil and that no ridge of soil is visible in the field.

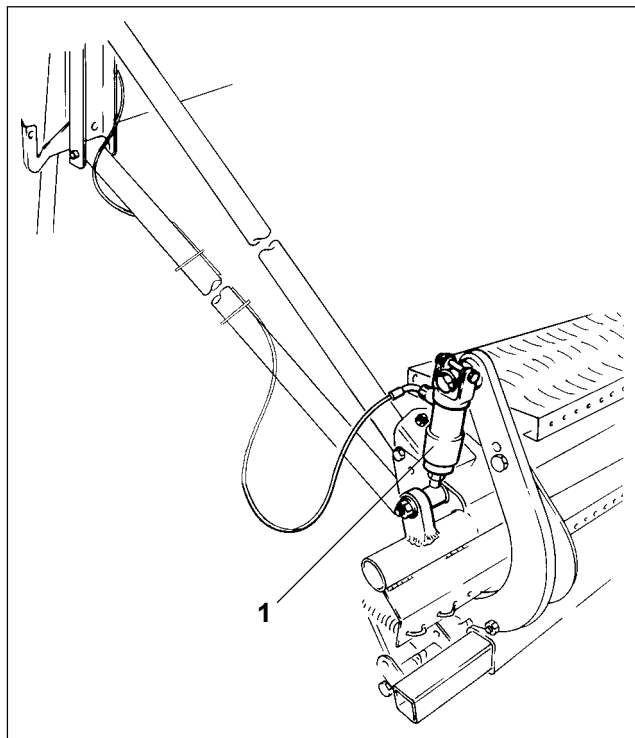


Fig. 14.7

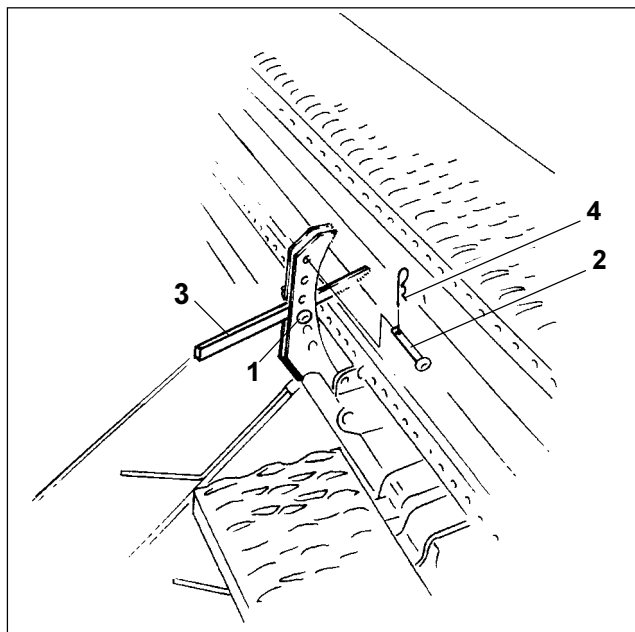


Fig. 14.8

14.5 Road transport

For transport on public roads, the outer square tubes (Fig. 14.9/1) carrying the outer harrow tines (Fig. 14.9/2) should be slid back into the centre carrier tube. Before you can do this, slacken clamping bolt (Fig. 14.9/3) and retighten firmly afterwards.

In the field bring the outer harrow tines (Fig. 14.9/2) into operating position according to para. 14.2.



Before transport dismantle the outer carrying tubes (Fig. 14.9/1) so that the transport width of 3 m will not be exceeded.

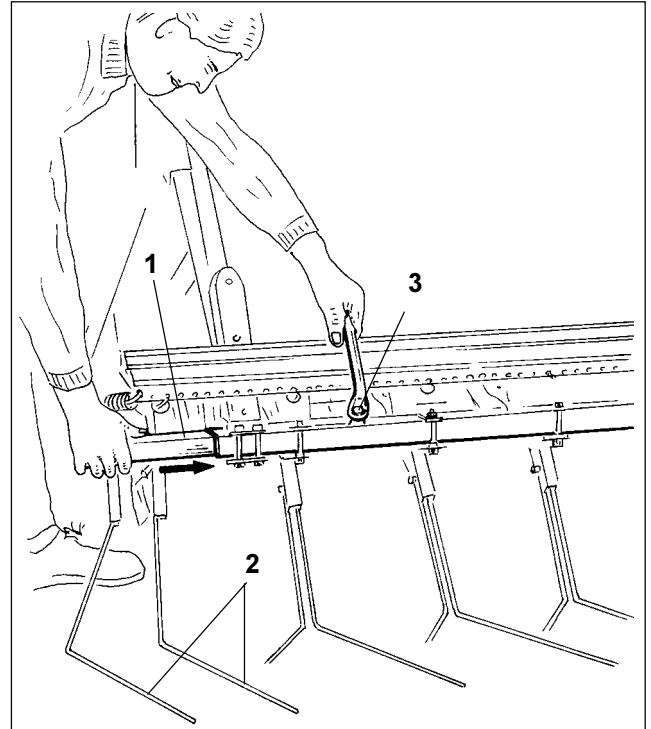


Fig. 14.9

15.0 Creating tramlines with AMADOS/AMALOG-tramlining control

Tramlines are marks (Fig. 15.1/1), in which no seed is sown. The husbandry tractor determines the track width. The spacing between the tramlines corresponds to the working width of the sprayer (Fig. 15.1/2) and of the centrifugal broadcaster.

With the aid of the tramlining control, tramlines are created in the field, in which the fertiliser broadcaster or sprayer with exact working widths operate.

The switching rhythm (please refer to table Fig. 15.2) depends on the working width of the seed drill and the working width of the fertiliser broadcaster or of the field sprayer.

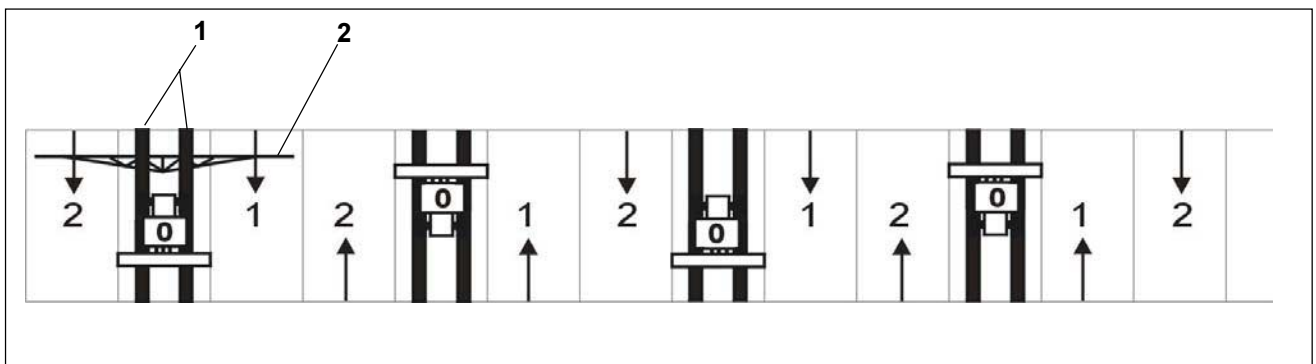


Fig. 15.1

	Working width of the seed drill				
	2,5 m	3,0 m	4,0 m	4,5 m	6,0 m
Switching rhythm	Spacing between the tramlines (working width of the fertiliser spreader and of the field sprayer)				
3		9 m	12 m		18 m
4	10 m	12 m	16 m	18 m	24 m
5		15 m	20 m		30 m
6	15 m	18 m	24 m	27 m	36 m
7		21 m	28 m		42 m
8	20 m	24 m	32 m	36 m	
9		27 m	36 m		
2	10 m	12 m	16 m	18 m	24 m
6 plus	15 m	18 m	24 m	27 m	24 m 36 m
5 / 13 right hand			18 m		
5 / 13 left hand					

Fig. 15.2

t691gb01

When supplied, the tramline spacing of your implement has been set to the track width of your husbandry tractor according to your prior indication.

An electric lifting spindle motor (Fig. 15.3/1) or a Bowden control which is connected with the switch box, actuate the mechanism inside the tramline flap box (Fig. 15.3/2) which shuts the outlets (Fig. 15.3/3) towards the tramline coulters and which leads the seed through a tube (Fig. 15.3/4) back into the seed box.

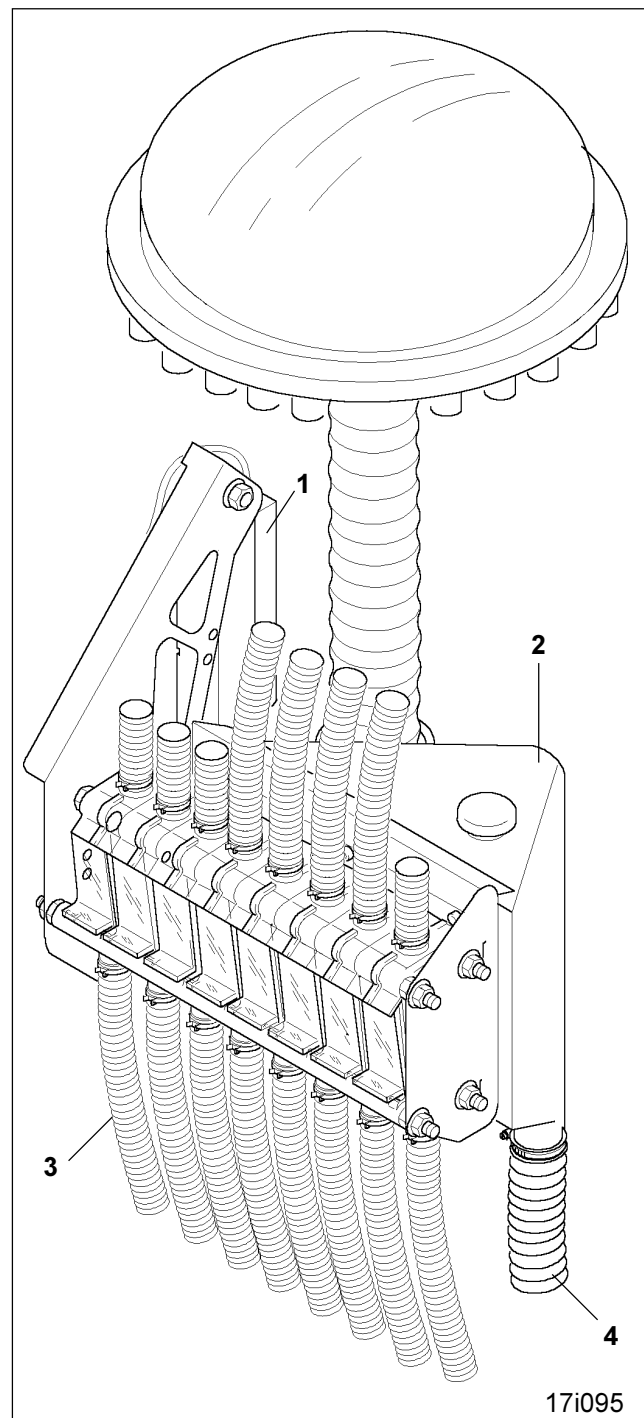
When the figure "0" appears on the display of AMADOS/AMALOG or in the sight window of the switch box, the seed inside the flap box (Fig. 15.3/2) is not delivered towards the tramline coulters but back into the seed box and tramlines are created.

Through the flap box the seed is delivered towards 8 coulters which can be used as tramline coulters. If it is desired that when creating tramlines the seed flow should not be interrupted on all 8 coulters, the 8 tramline coulters may be converted to normally sowing coulters at any random number or vice versa. For this the relevant flap (Fig. 15.4/1) inside the flap box should be deactivated (for normally sowing coulters) or activated (for tramline coulters). Please find the detailed description in para. 15.5.

When the figure "0" appears on the display of AMADOS/AMALOG or in the sight window of the switch box the activated flaps (Fig. 15.4/1) are brought into position "return flow" (illustrated in a broken line). In this position the seed is delivered back into the seed box. Deactivated flaps do not move and the seed is going on to be delivered towards the coulters.

AMADOS/AMALOG checks the setting of the tramline flap box with the aid of a sensor and gives alarm in case of a wrong setting.

AMADOS/AMALOG receives the impulses for switching forward the tramline control by the track marker shuttle valve or by the marker arm sensors.



17i095

Fig. 15.3

15.1 Starting the operation

Take the "starting figure" from the tramline schedules (Fig. 15.5) and set the "starting figure" on the display of AMADOS/AMALOG prior to starting the operation.

Example:

"Starting figure" of switching rhythm "3"

In colum "C" move to figure "3" (switching rhythm 3). Change to column "D". The operation in the field starts with the first figure below the letters "START" in colum "D". In our example with "3-fold rhythm" the operation begins with the figure "2" (start figure).



The setting mechanism of the tramline flap box switching is coupled with the hydraulically actuated track markers. Prior to setting the starting figure note, that the correct track marker arm lowers when starting the operation. If necessary, switch once more the track marker actuation before setting the starting figure.

AMADOS/AMALOG receives the necessary information for switching ahead the tramline control when the track marker is raised at the headlands but also when the track markers are raised in the field, e. g. in front of obstacles.



Please note the hints in the instruction manual AMADOS/AMALOG when lifting the track marker in front of obstacles!

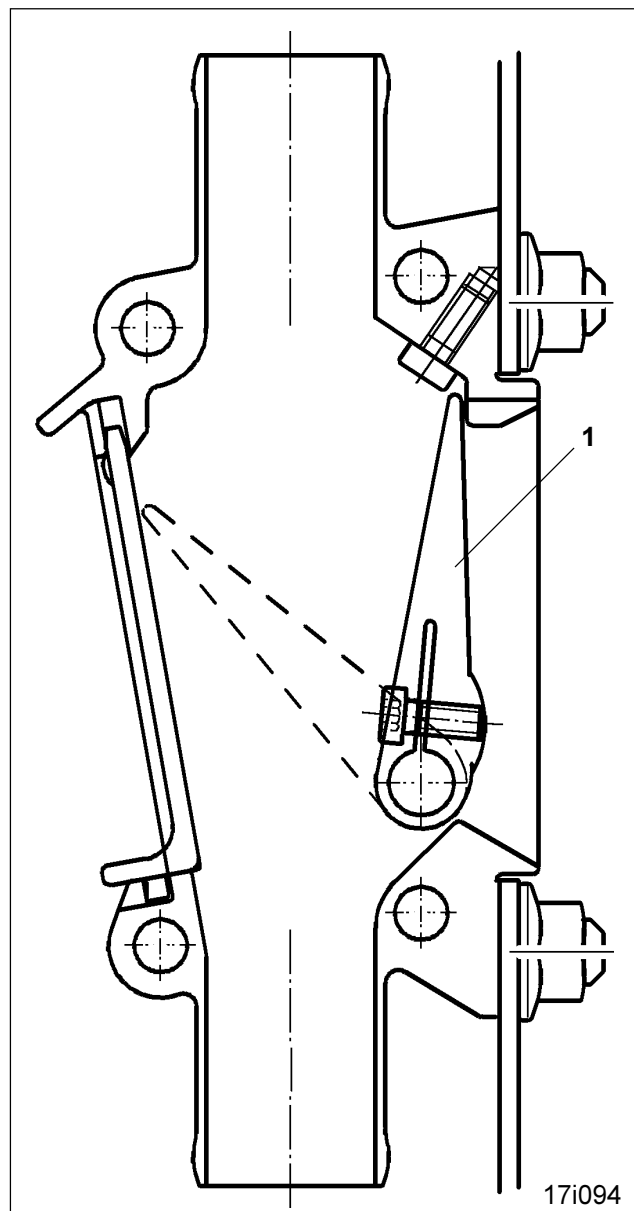


Fig. 15.4

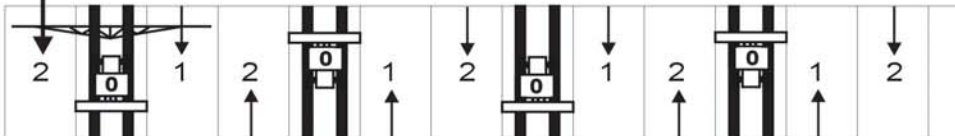
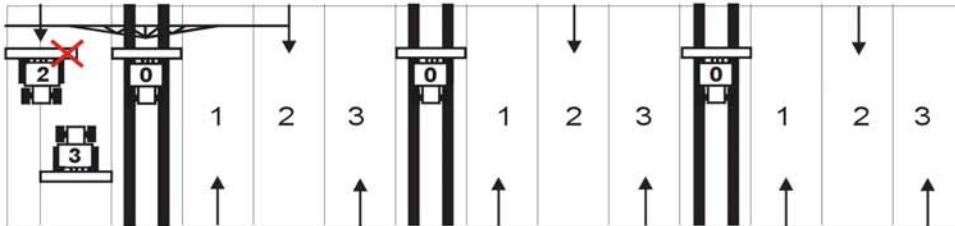
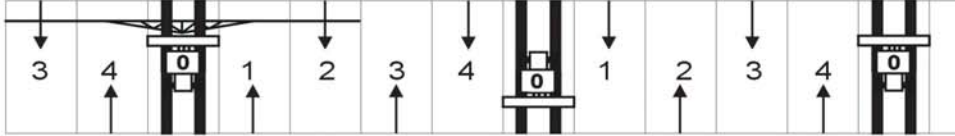
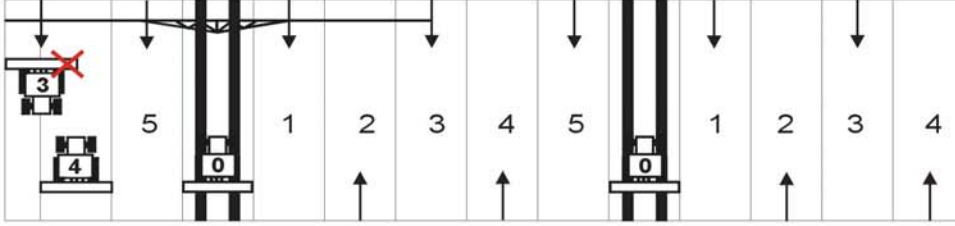
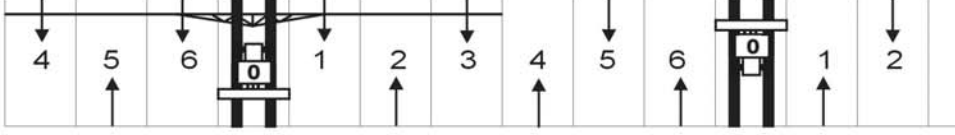
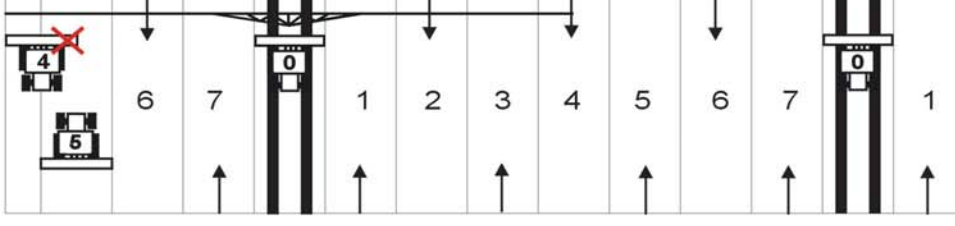
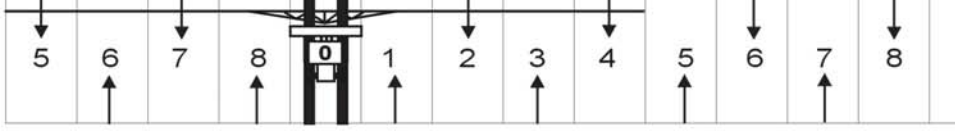

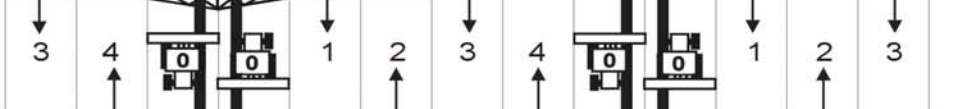
A	B	C	D
START DÉPART			
3,0 m 4,0 m 6,0 m	9 m 12 m 18 m	3	
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m	10 m 12 m 16 m 18 m 24 m	4	
3,0 m 4,0 m 6,0 m	15 m 20 m 30 m	5	
2,5 m 3,0 m 4,0 m 4,5 m	15 m 18 m 24 m 27 m	6	
3,0 m 4,0 m	21 m 28 m	7	
2,5 m 3,0 m 4,0 m	20 m 24 m 32 m	8	
3,0 m	27 m	9	
2,5 m 3,0 m 4,0 m 4,5 m	10 m 12 m 16 m 18 m	2	
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m	15 m 18 m 24 m 27 m 36 m	6 plus	

Fig. 15.5

15.2 Hints for creating tramlines with 4-, 6- and 8-fold switching rhythm

Fig. 15.5 illustrates examples for creating tramlines with 4-, 6- and 8fold switching rhythms. The seed drill operates with half its working width during the first run in the field. Necessary for this is the insert (Fig. 15.6/1) for the half-side shut-off of the outlets inside the distributor head which is available as special option.

However, the first run in the field may also start by creating a tramline (see Fig. 15.7). If the operation is started with full working width and creating a tramline

- the fertiliser spreaders spread to one side with the aid of a border spreading disc or a border spreading device during the first run in the field.
- on field sprayers one boom is switched off during the first run in the field.

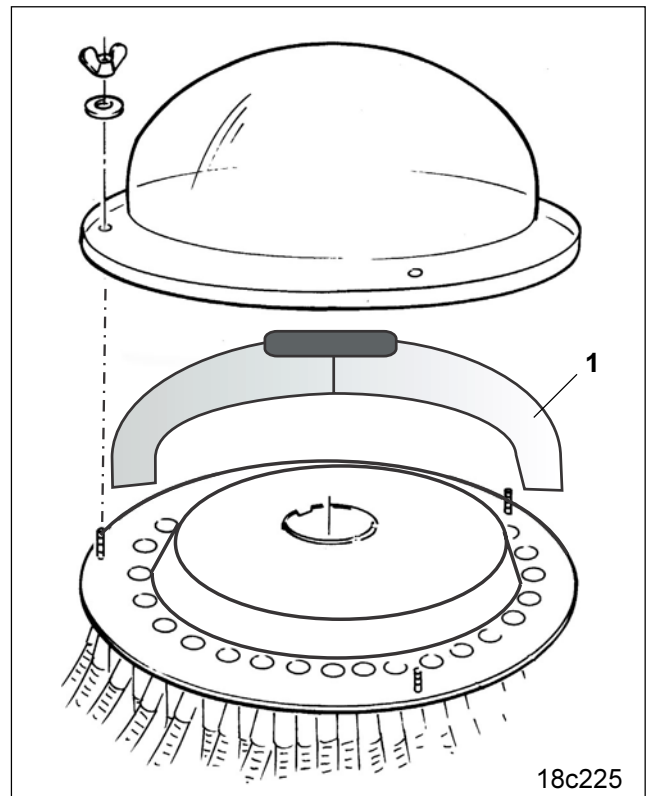


Fig. 15.6

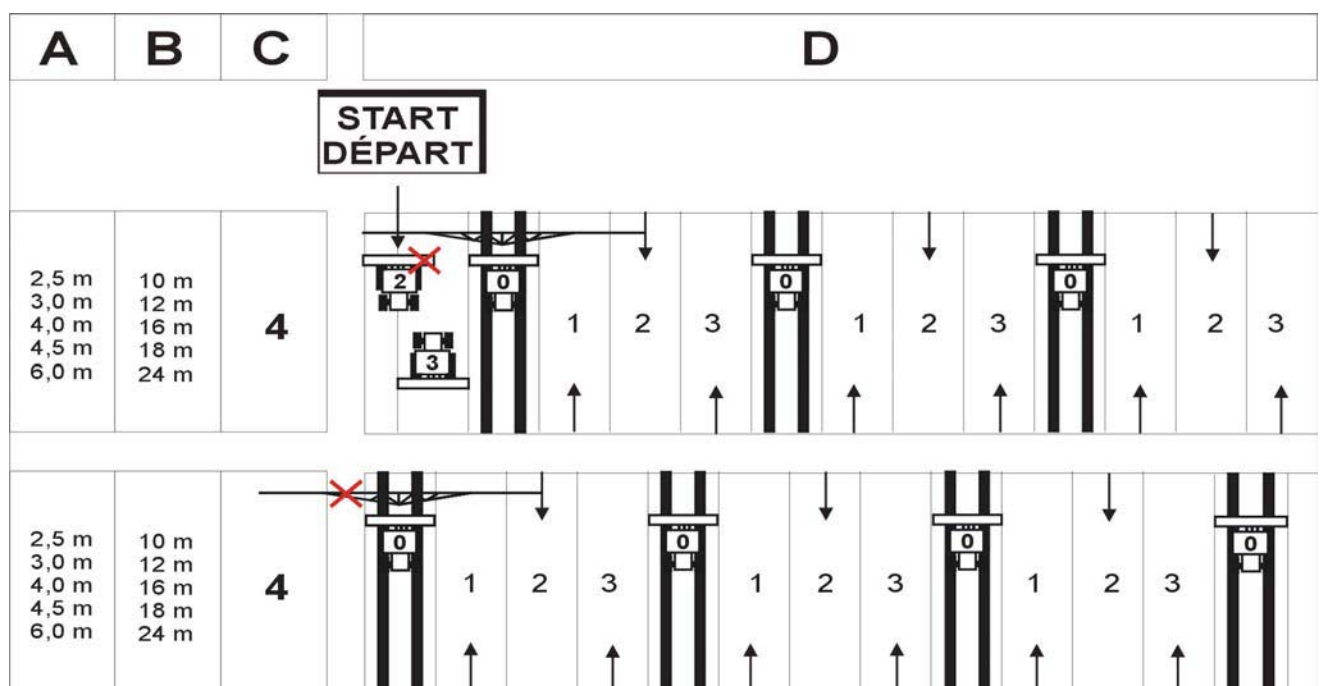


Fig. 15.7

15.3 Hints for creating tramlines with 2-fold and 6-plus switching rhythms

Tramlines with 2-fold and 6-plus switching rhythms (see Fig. 15.8) are created during one travel in the field to and fro.

The flow of the seed to the tramline coulters must only be interrupted on seed drills

- 2-fold switching rhythm on the right hand side of the seed drill
- 6-plus switching rhythm on the left hand side of the seed drill

The operation has always to start on the right hand side of the field.

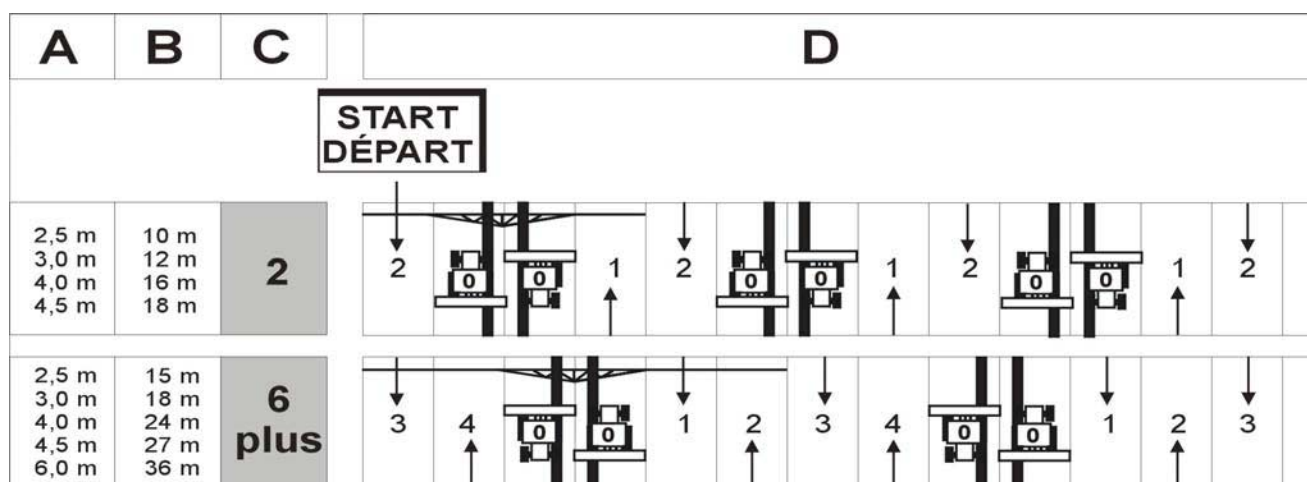


Fig. 15.8

15.4 Setting the tramline to the wheel marks of the husbandry tractor

Tramlines are marks in which no seed is sown. The spacing of the marks corresponds to the track width of the husbandry tractor. On supply of the seed drill the tramline kit has been set to the wheel marks of your husbandry tractor. Should it be necessary, e. g. when purchasing a new husbandry tractor, to set your tramline system onto the wheel marks of the new tractor, the seed tubes (Fig. 15.9/1) on the coulter frame have to be interchanged.



Seed drills with 2-fold switching rhythm have to be equipped with tramline coulters only on the right hand side of the seed drill (see para. 15.3).



Seed drills with 6-plus switching rhythm have to be equipped with tramline coulters only on the left hand side of the seed drill (see para. 15.3).



If your seed drill is equipped with a pre-emergence marker kit, adjust the marker discs accordingly..

15.5 Matching with the tyre width

If the number of tramline coulters should be changed, activate or deactivate flaps inside the tramline flap box (Fig. 15.10/1) according to the required tramline coulters (please also refer to para. 15.0).

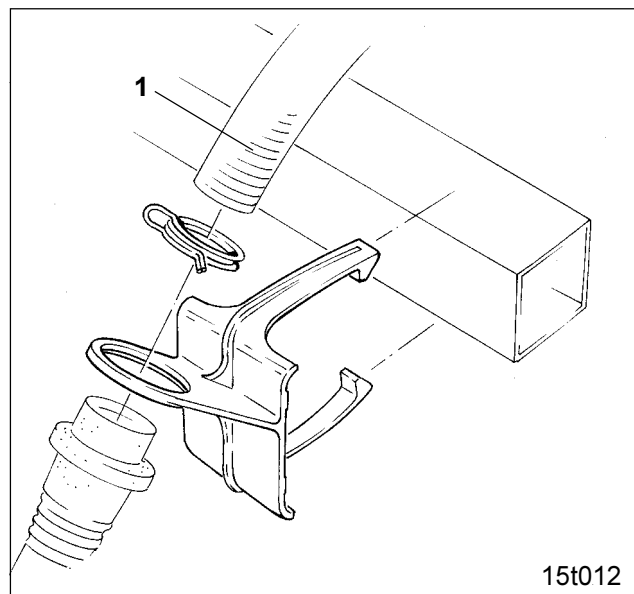


Fig. 15.9

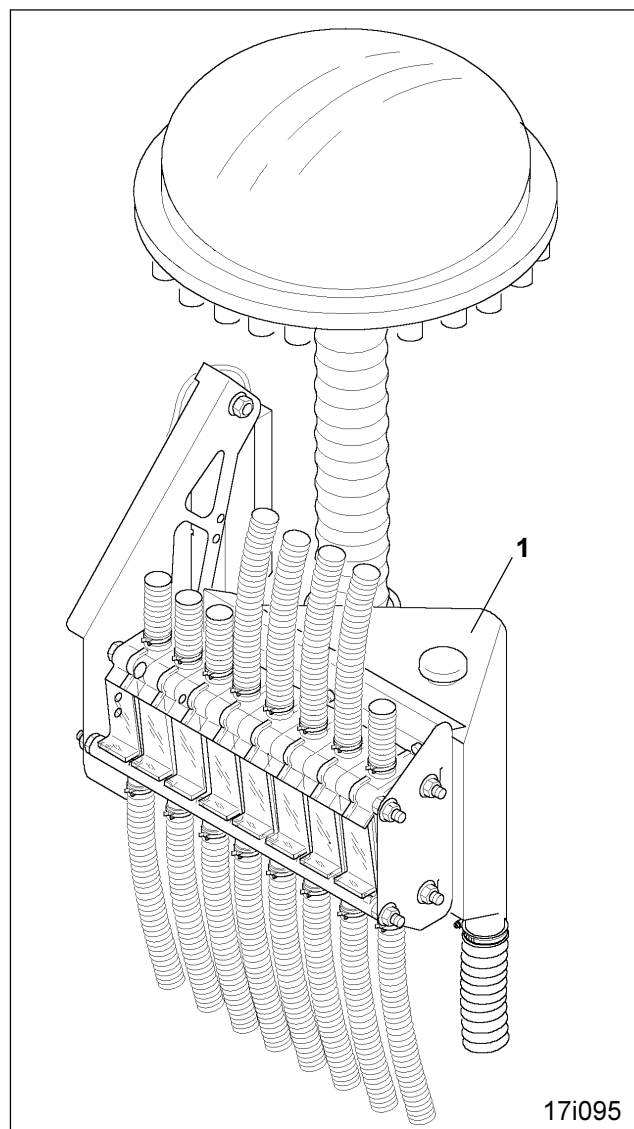


Fig. 15.10

Activate flap (for tramline coultter)

Every individual flap (Fig. 15.11/1) can be activated inside the flap box. In order to reach the flap, remove the relevant fitting window (Fig. 15.11/2). For this, push the fitting window upwards and remove it to the front.

Affix the flap to be activated (Fig. 15.11/1) with the inner hex. bolt (Fig. 15.11/3) on the shaft. When tightening the bolt, AMADOS/AMALOG or the switch box must not be in position "0" and the flap must be pressed – e. g. with your finger as shown in Fig. 15.12, against the stop (Fig. 15.12/5). Do not tighten the bolt too firmly so that the flap will not be strained.

Drive in the fixing bolt (Fig. 15.11/4) free of strain so that the flap may easily pass the bolt head.

Shut the fitting window.

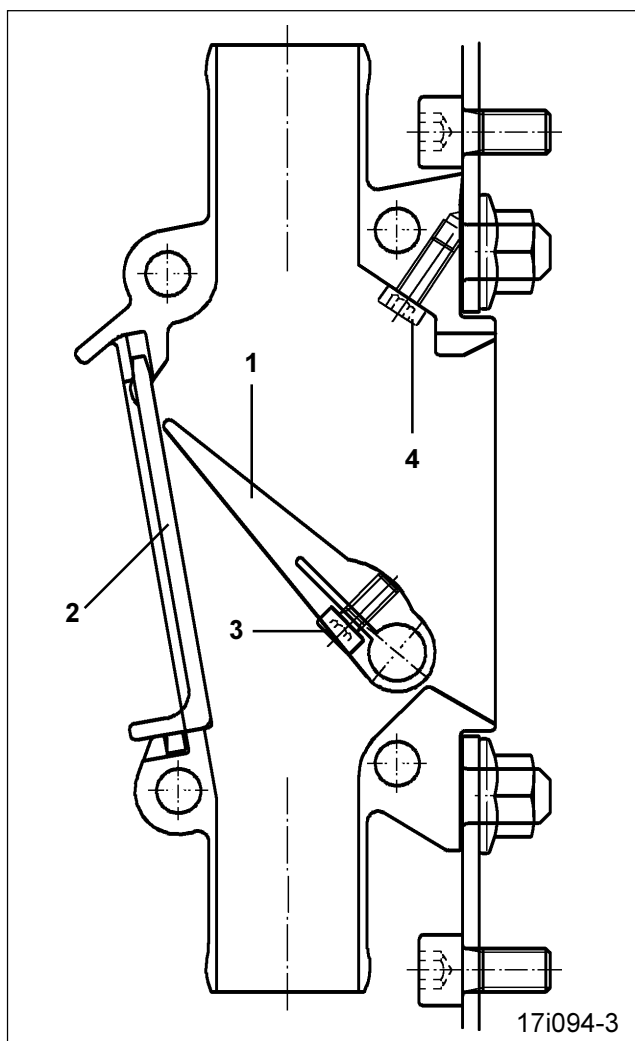


Fig. 15.11

Deactivate flap (for a normal sowing coultter)

Every individual flap may be deactivated (Fig. 15.12/1). In order to reach the flap, remove the relevant fitting window (Fig. 15.12/2). For this, push the fitting window upwards and remove it to the front.

AMADOS/AMALOG or the flap box may not be in switching position "0". Press the flap, e. g. with your finger, as illustrated in Fig. 15.12 against the stop (Fig. 15.12/5) and slacken the inner hex. bolt (Fig. 15.12/3) with which the flap to be deactivated is fixed onto the shaft until the flap can be moved freely on the shaft.

Turn out fixing bolt (Fig. 15.12/4) for approx. 5mm so that the deactivated flap cannot open and the opening towards the seed box remains shut.

Shut the fitting window.

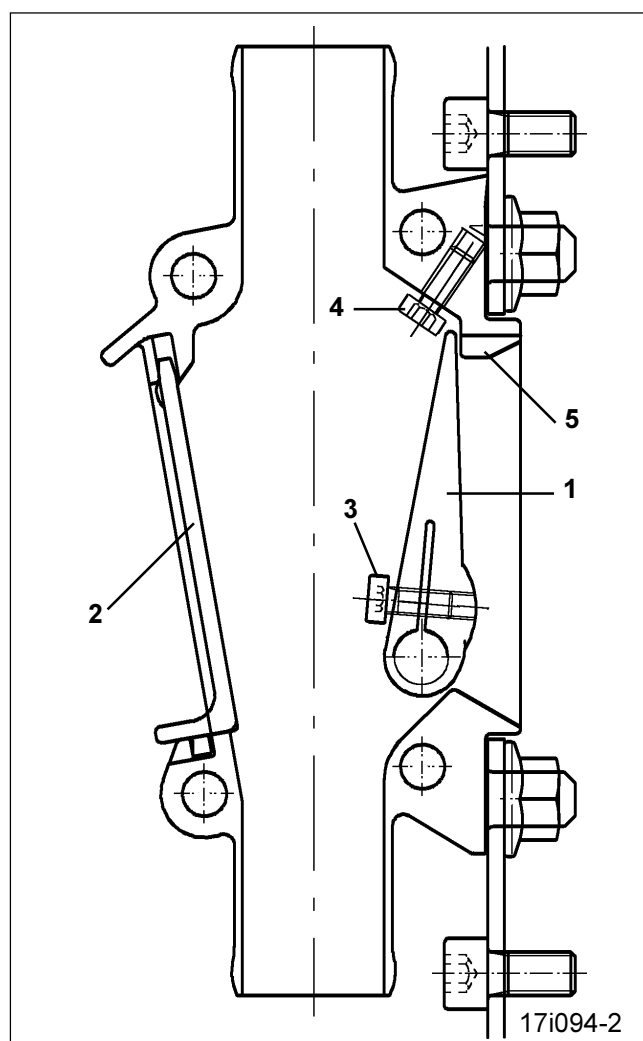


Fig. 15.12

16.0 Pre-emergence marker (special option)

With the aid of the tramlining control, during sowing operation, tramlines are created with determined spacings in which later on fertiliser broadcasters or field sprayers may travel. The marker discs (Fig. 16.1/1) of the pre-emergence marker mark these tramlines. The tramlines are visible in the field prior to the seed emergence. After sowing, it is then possible to travel along the tramlines which are not yet visible by the seed, e.g. for pre-emergence spraying.

If whilst creating tramlines the tramline coulters do not deliver any seed, both marker discs (Fig. 16.1/1) of the pre-emergence marker drop into work, marking the soil and creating tramlines.

The marker discs (Fig. 16.2/1) of the pre-emergence marker are lifted out of work when no new tramlines are created.



The hydraulically actuated pre-emergence marker, the electrically actuated shutters inside the distributor head and the hydraulically actuated track markers are coupled together (please refer to hydraulic circuit diagram at the beginning of this instruction manual). Connect the hydraulic rams on the tractor with a single acting control spool valve.



Before actuating the control spool valve, advise people to leave the danger area. Danger of injury from moving parts.

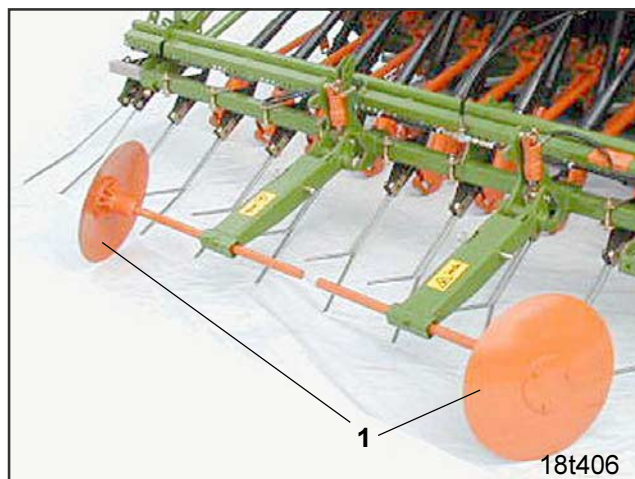


Fig. 16.1

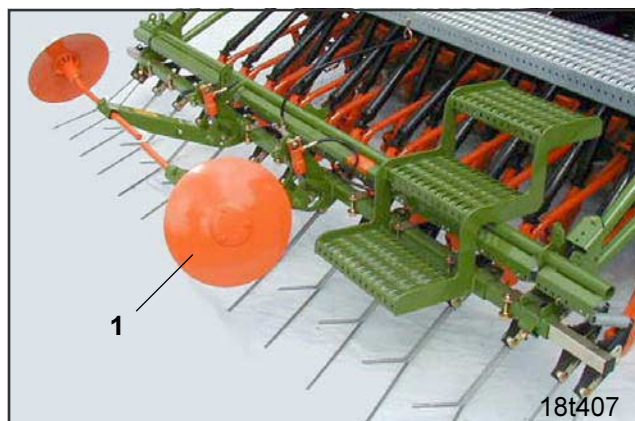


Fig. 16.2

16.1 Fitting

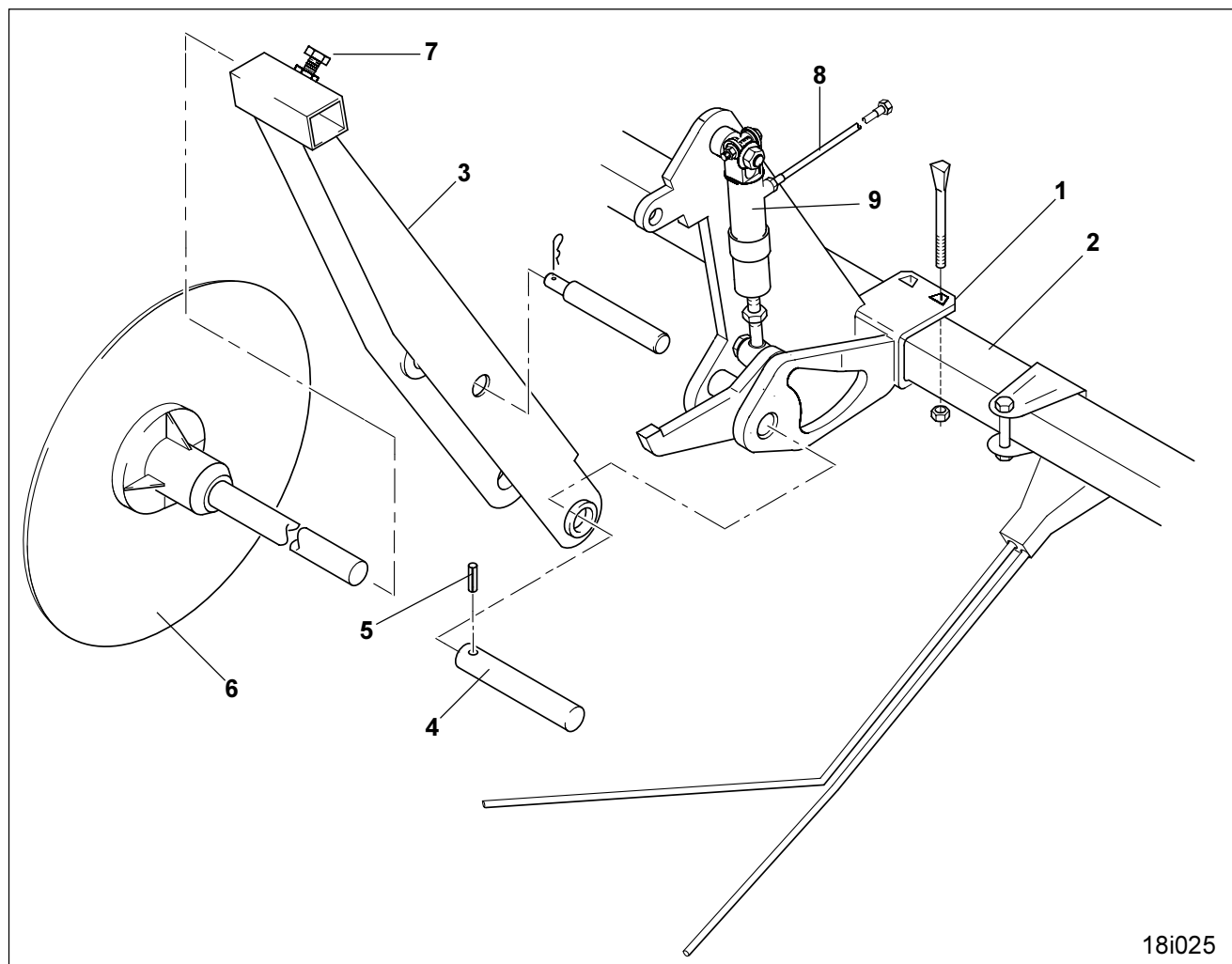
The pre-emergence marker unit is delivered pre-assembled by the factory

- Attach the extra coverage following harrow
- Attach two fixing brackets (Fig. 16.3/1) to the extra coverage following harrow
- Mount the marker disc carrier arm (Fig. 16.3/3) by means of the pins (Fig. 16.3/4) and expansion pin (Fig. 16.3/5) and secure.
- Insert the marker discs (Fig. 16.3/6) into the marker disc carriers (Fig. 16.3/3) and clamp by using hex. bolts (Fig. 16.3/7).
- Connect the hydraulic hoses (Fig. 16.3/8) to both hydraulic rams (Fig. 16.3/9) and connect together with the hydraulic ram for the tramline shutter inside the distributor head with the electr.-hydraulic valve (see circuit diagram para. 2).



Guide the hydraulic hoses in such a way that they will not be torn off or damaged by the movement of the extra coverage following harrow.

- Connect hydraulic rams on the tractor to a single acting control spool valve.
- Check hydraulic hoses for leakage.



18i025

Fig. 16.3

16.2 Setting the marker discs

The marker discs (Fig. 16.4/1) trace the tramlines created by the tramlining control unit and have to be set to the correct track width:

- Slacken hex. bolts (Fig. 16.4/2)
- Move the marker discs (Fig. 16.4/1) in the marker disc carrier arm corresponding to the track width of the tramlines.
- Set the discs in such a way that they run on light soils about parallel to the operating direction and angle them aggressively (on grip) on heavier soils.
- Firmly retighten hex. bolts (Fig. 16.4/2).

Hints

for 2-bout switching rhythm and 6-plus switching rhythm

Tramlining control units with 2-bout switching rhythm or 6-plus switching rhythm are equipped in such a way that the track width of the husbandry tractor is traced when once driving up and down in the field. Therefore only fit one of the two marker discs (Fig. 16.4/1) when using these switching rhythms.

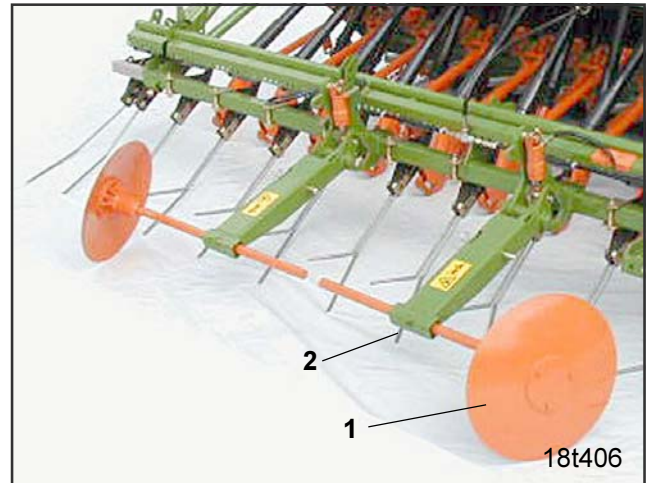


Fig. 16.4

16.3 Transport on public roads

For transport the marker disc carriers (Fig. 16.5/1) should be locked on the fitting brackets (Fig. 16.5/2) by pins (Fig. 16.5/3) and secured by using clip pins (Fig. 16.5/4). The marker disc carriers (Fig. 16.5/1) are then completely folded upwards and are positioned with the marker discs vertically above the extra coverage following harrow. If the seed drill shall be transported on public roads, remove the marker discs (Fig. 16.5/5).



Before any transport on public roads remove the marker discs (Fig. 16.5/5) from the marker disc carriers (Fig. 16.5/1).

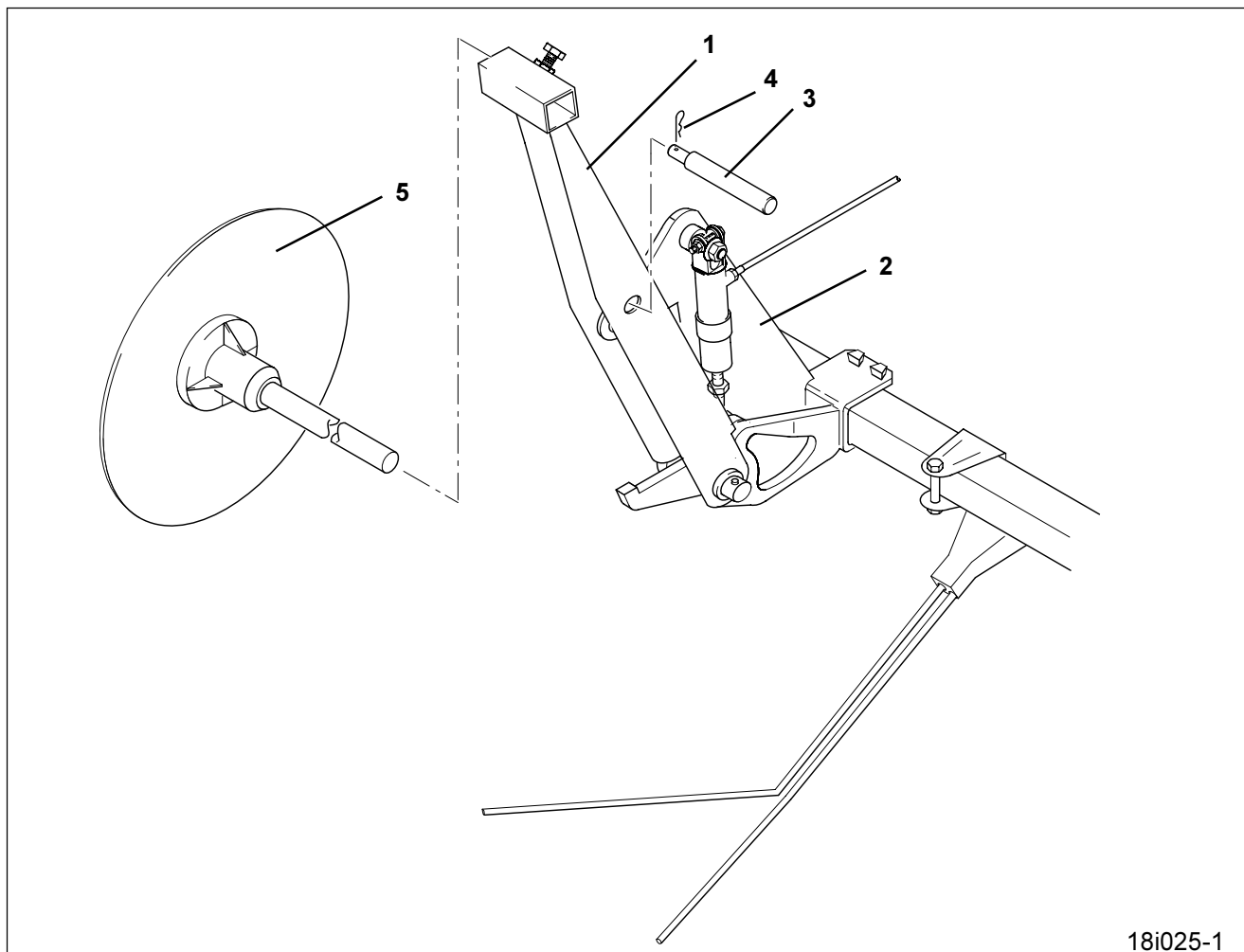


Fig. 16.5

17.0 Transport on public roads



When travelling on public roads and ways the execution of tractor and machinery should correspond to the national road transport and traffic rules. Both, the vehicle owner and the operator, are responsible for adhering to the legal traffic rules.

When travelling on public roads and ways, the following advice should be followed:

Standing

on the seed drill during travel is prohibited.

Transport width

The transport width of 3 m must not be exceeded..

Track markers

Bring the track markers into transport position (see para. track markers).

Pre-emergence marker

Remove marker discs from the marker arms (see para. pre-emergence marker).

Traffic lights

Equip your seed drill with the legally required traffic lights (option) and check for function before travelling.

Attach traffic lights and red/white striped warning plates in direction of travel (Fig. 17.1/1) and at the rear (Fig. 17.1/1).

Extra coverage following harrow

Remove the outer harrow elements of the 3 m extra coverage following harrow (see para. Extra coverage following harrow). Cover all tines of the extra coverage following harrow protruding to the rear with the traffic safety board (Fig. 17.2/2, special option). Attach a second set of traffic lights (Fig. 17.2/3) onto the quadrant tube of the extra coverage following harrow (not necessary with the firmly attached traffic light kit).

Transport height

For transport of the seed drill ensure that the following measurements are not exceeded:

- Distance of rear light upper edge from the road max. 1550 mm.
- Distance of the rear reflector from the road max. 900 mm.

In transport position the maximum transport width of 3.0 m may not be exceeded. Before transport bring the star



Fig. 17.1

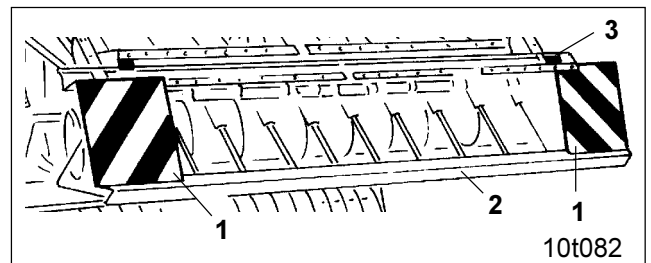


Fig. 17.2

wheel in transport position (Fig. 17.3).

Briefly lift the star wheel, push towards the implement's centre and secure by using a lynch pin (Fig. 17.4/1). During operation insert the lynch pin into the second hole (Fig. 17.5/1).

Soil tillage implement

Also the soil tillage implement must correspond to the national legal traffic rules. For further details, please refer to the instruction manual of your soil tillage implement.

Tractor axle loads / Total weight

The permissible tractor rear axle load, the permissible total weight of the tractor and the permissible load capacity of the tractor tyres must not be exceeded (empty seed box).

When lifting the seed drill for transport 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 maintained. Otherwise, the tractor's stability and steering will be affected. If necessary, use front axle weights.

Observing these hints helps to prevent accidents in public road traffic.



Fig. 17.3



Fig. 17.4



Fig. 17.5

18.0 Maintenance and care



Observe the general safety and accident prevention advice when carrying out maintenance and care.

18.1 Check bolted connections

All bolted connections of the implement should be checked after the first 10 hours of operation and tightened if necessary.

18.2 Cleaning the implement

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



In case you wish to use air pressure to clean the seed box, please be reminded that the dust of seed dressing is poisonous and must not be inhaled.



Regularly remove seed residue from the metering unit. Beforehand empty seed box. Swollen or germinated seed residues in the metering units may affect the seed rate or block the moving of the seed wheels and lead to their breakage.

For cleaning the metering unit, open

- the transparent plastic flap (Fig. 18.1/1)
- the injector sluice flap (Fig. 18.1/2) and
- the emptying flap.

For opening the emptying flap behind the metering unit, press lever (Fig. 18.1/3) downwards and arrest.

Empty metering wheels by some turns on the calibration crank.

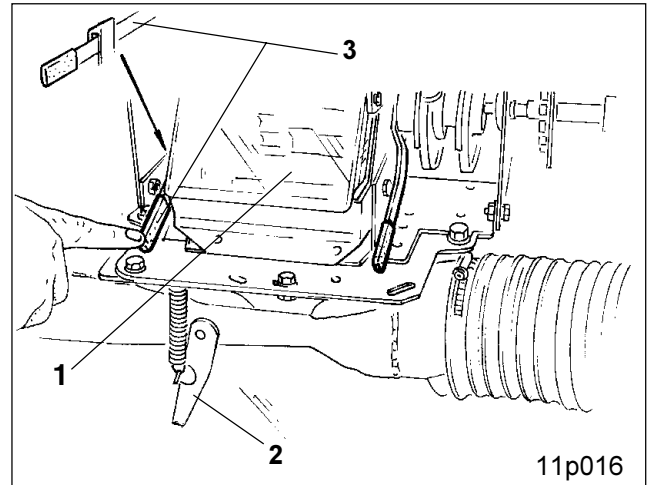


Fig. 18.1

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18.3 Checking the oil level in the gear-box

The oil level inside the gearbox should be checked at the oil gauge window (Fig. 18.2/1) at the implement in horizontal position. It is not necessary to change the gearbox oil.

For refilling oil, the cover of the gearbox (Fig. 18.2/2) must be taken off:

Filling quantity: 0,9 litres

Use only the following kinds of oil:

Manufacturer: Messrs. Wintershall
Kind of oil: Wintal UG 22 WTL-HM

or

Manufacturer: Messrs. Fuchs
Kind of oil: Renolin MR 5 VG 22.

18.4 Greasing

Grease the PTO shafts according to the lubricating chart of the PTO shaft manufacturer.

Carefully clean greasing nipples and grease gun before greasing.

18.5 Exchanging the WS-coulter tip or sabre coulter tip

Worn coulter tips (Fig. 18.3/1) on WS(Suffolk) coulters or sabre coulters can be exchanged. It is not necessary to remove the coulter support (Fig. 18.3/2). However, pull the funnel (Fig. 18.3/3) out of the coulter unit. To do this, press the two naps (Fig. 18.3/4) of the funnel into the coulter unit. When fitting ensure that the naps catch into the location slots (Fig. 18.3/5).

Remove Allen screw (Fig. 18.3/6), remove the coulter tip (Fig. 18.3/1) from its bracing and affix the new coulter tip in reverse order.



Fig. 18.2

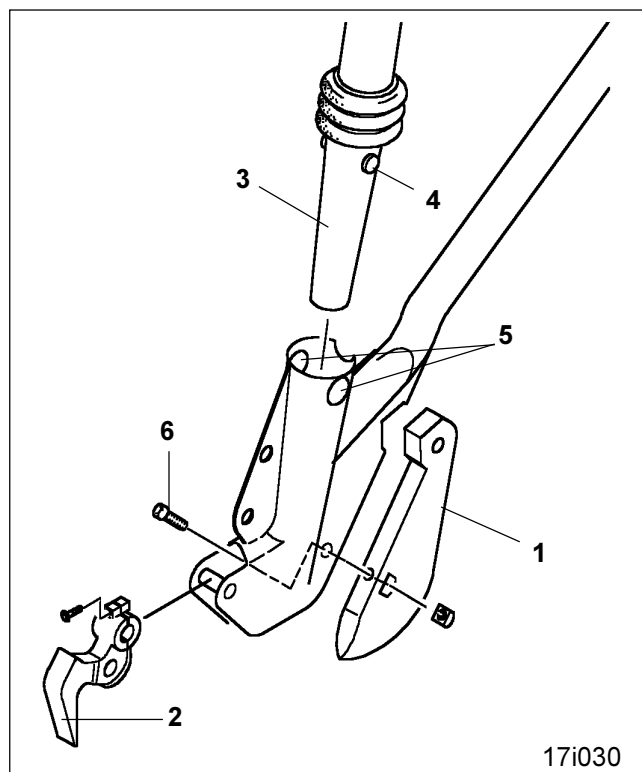


Fig. 18.3

18.6 Checking the distributor head for cleanliness

During operation regularly check from the tractor cab the distributor head for cleanliness by looking through the translucent distributor head hood and after operation from outside. Immediately remove dirt and seed residue. Swollen or germinating seed residues may cause blockages.

For cleaning the distributor head:

- Relieve the hydraulic system from pressure
- Remove the distributor outer hood (Fig. 18.4/1).

18.7 Hydraulic hoses

18.7.1 Checking when starting and during operation

The ordinary condition of the hoses should be checked before starting operation and then in regular intervals (see below) by a skilled person.

If the hoses are found defective in any way, exchange them immediately

The maintenance of the checking intervals should be recorded by the operator.

Checking intervals

- for the first time when putting to operation
- thereafter at least once a year.

Checking points

- Check hose casing for damage (kinks, cuts and abrasion, trapping, rubbing points).
- Check whether the hose casing is brittle.
- Check hose for deformation (bubbles, buckling, squeezing, separation of layers).
- Check for leakage
- Check the appropriate fitting of the hoses.
- Check the hose for firm seating in the armature.
- Check connecting armature for damage and deformation.
- Check for corrosion between connecting armature and hose.
- Do not exceed the permissible period of use.

18.7.2 Exchange intervals

The period of use of any hydraulic hose circuit should not exceed 6 years (including a possible storing period of two years maximum).

18.7.3 Marking

Hydraulic hoses are marked as follows:

- Name of the manufacturer
- Date of production
- Maximum dynamic operational pressure.

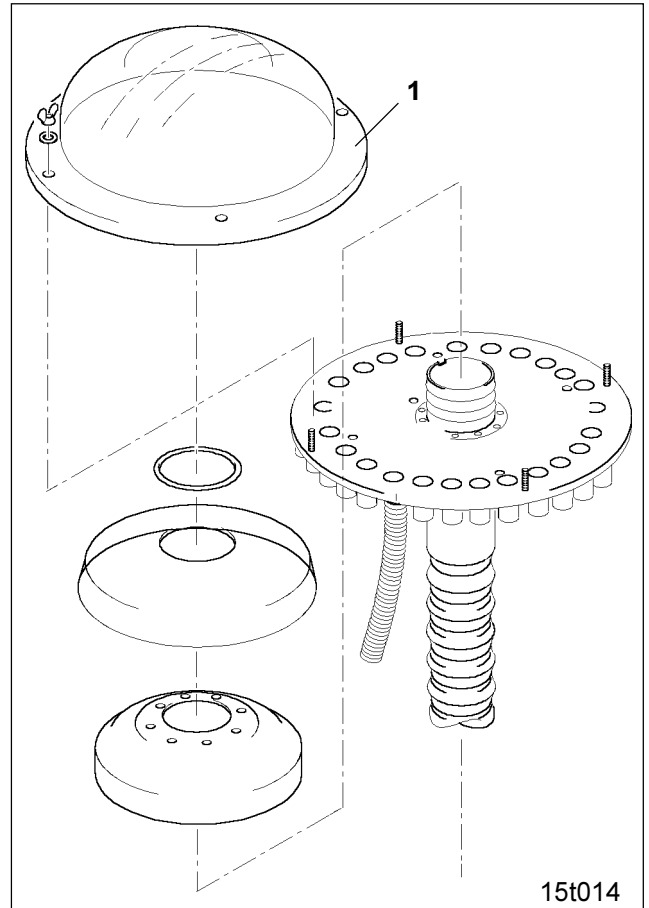


Fig. 18.4

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18.7.4 Please observe when fitting and removing



Before working on the hydraulics, please read and adhere to para. 3.6.4.

Affix the hydraulic hoses on the fixing points given by the manufacturer.

- Always ensure that hydraulic parts and connections are clean
- The hoses have to be fitted in such a way that their natural placement and movement are not hindered
- During operation the hoses should not be under tension, twisted or strained by external forces
- The permissible bending radius must be observed
- The hoses should not be painted

18.7.5 Fitting the hose armatures with O-Ring seal and clamping nut



The joints with O-ring seals may not be tightened as firmly as the former cutting ring seals.

Fasten the clamping nuts by hand and then tighten them with the spanner by min. 1/4 and max. 1/2 turn.

If this joint is tightened more firmly the tapered joints (especially the welding pivot on the hydraulic rams) may burst.





AMAZONEN-WERKE **H.DREYER**
GmbH & Co. KG

D-49202 Hasbergen-Gaste
Tel.: Hasbergen (0 54 05) *501-0
Fax: (0 54 05) 50 11 93

<http://www.amazone.de>

D-27794 Hude/Oldbg.
Tel.: Hude (0 44 08) *927-0
Fax: (0 44 08) 92 73 99

email: amazone@amazone.de

AMAZONE-Machines Agricoles S.A.
F- 57602 Forbach/France . rue de la Verrerie
Tél.: (0033) 38 78 46 57 0
Fax: (0033) 38 78 46 57 1

