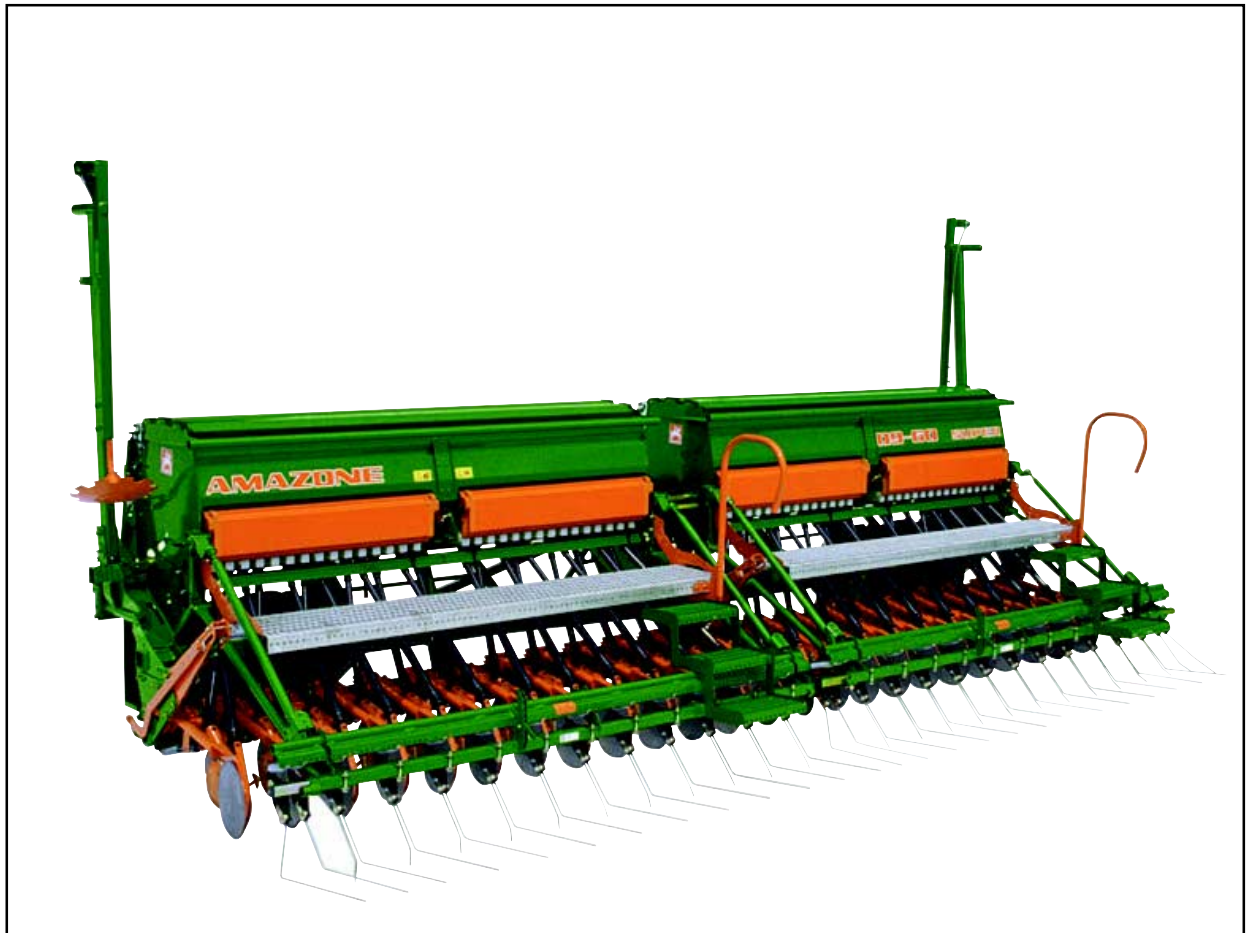


Instruction manual

AMAZONE Seed Drill D9-60 SUPER



MG 722
DB 2006 GB 09.01
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 seed drill D9 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 to 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.

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

AMAZONEN-Werke
H. Dreyer GmbH & Co. KG

Hints for this instruction manual

Keep this instruction manual so that it is always to hand. Also in the event of sale you can 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 liability to existing users, past or present machines.

Symbols in this instruction manual

In this instruction manual many warning and precautionary hints are given by the use of symbols. The identification and explanations for these symbols are given in the following.



General warning pictographs (DIN 4844-W9)

The warning pictographs indicate dangerous points on the machine. Observing these pictographs means safety for all persons using this machine.



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 Range of application

The seed drill is suited for containing within it's hopper seeds which are then metered out for sowing. The drill is constructed for the application of all commercially available arable seeds.

2.2 Manufacturer

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

2.3 Conformity declaration

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

2.4 Details when making enquiries and ordering

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

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

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



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

Original AMAZONE spare parts and options have been especially designed for your machine and have been checked. In cases where spare parts, and / or options have been fitted, which have not been approved by AMAZONE as well as any other arbitrary technical changes made to the machine, no liability will be accepted by AMAZONE for consequential losses or resulting damage!

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 D9

Serial-No.:

2.6 Technical data

AMAZONE Seed drill	D9-60 SUPER
Working width	6,0 m
WS-coulters:	
Number of rows	60
Row spacing	10,0 cm
RoTeC-coulters:	
Number of rows	48
Row spacing	12,5 cm
Capacity of seed box	1200 l
Capacity of seed box with extension	1720 l
Height of seed box without extension	1,28 m
Weight without extension	ca. 1000 kg
Tyres	31 x 15,5 / 15 Mitas Twin tyres on request
Air pressure	0,8 bar

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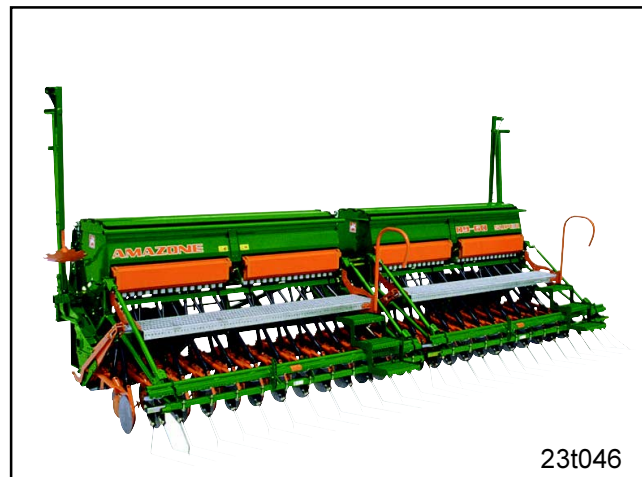


Fig. 2.1

AMAZONE seed drills D9 must be used:

- on the three point linkage of a tractor
- or in combination with a pto shaft driven soil tillage implement with packer roller
- behind a trailed soil tillage implement.

We recommend that you use your seed drill

- with WS-coulters after the plough or on soils with little organic matter on the surface
- with RoTeC-disc coulters on soils with or without organic matter on the surface.

2.7 Delivery

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.

2.8 AMAZONE WS-coulter Suffolk coulter with replaceable points

The AMAZONE WS-coulter (Fig. 2.2) is equipped with an exchangeable coulter point (Fig. 2.2/1) made from cast iron. Due to its high wear resistance, cast iron is a proven coulter point material. However, wear cannot be avoided during operation on aggressive, sandy and sharp edged soils. Worn coulter points can be exchanged after taking off an Allen key bolt.

The coulter is equipped with a pivoting guard flap (Fig. 2.2/2), which prevents blockage of the coulter outlet when the machine is lowered onto soft soil. During operation the coulter guard flap swivels back ensuring the free flow of seed. Hardly any wear can be observed on the coulter point. The coulter flap can easily be exchanged.

The coulter unit contains a plastic guide hopper (Fig. 2.2/3) which guides the seed directly behind the coulter point. 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 the 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 likelihood of blockage during mulch sowing because the dragging coulters hardly rake up any straw or other organic matter in the furrow.

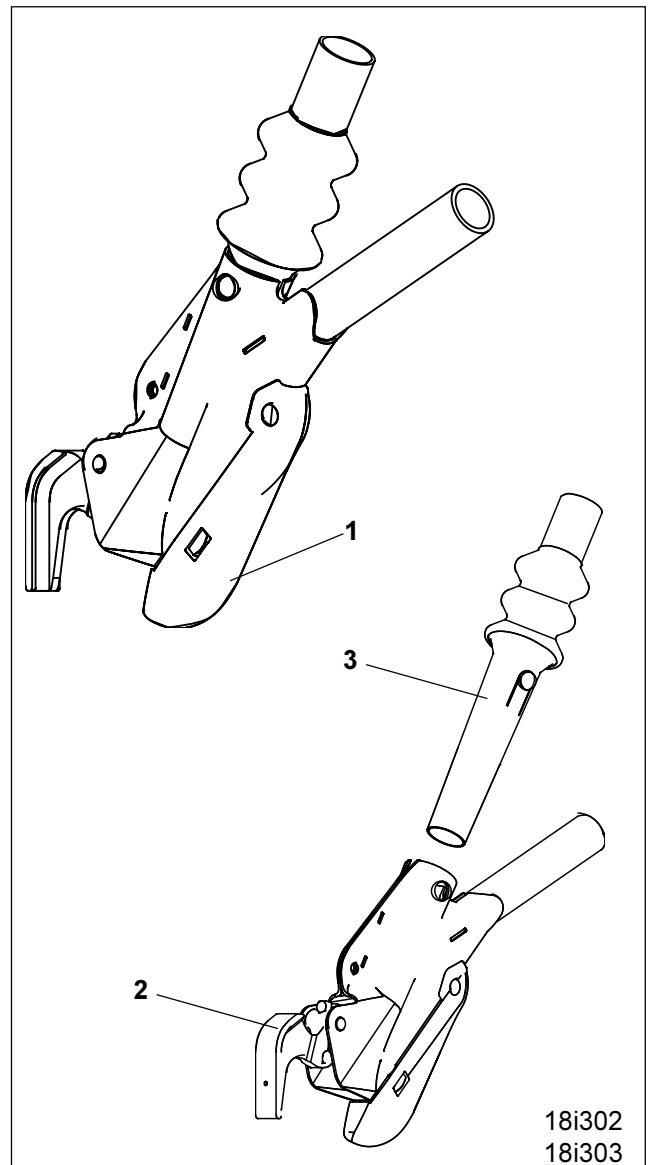


Fig. 2.2

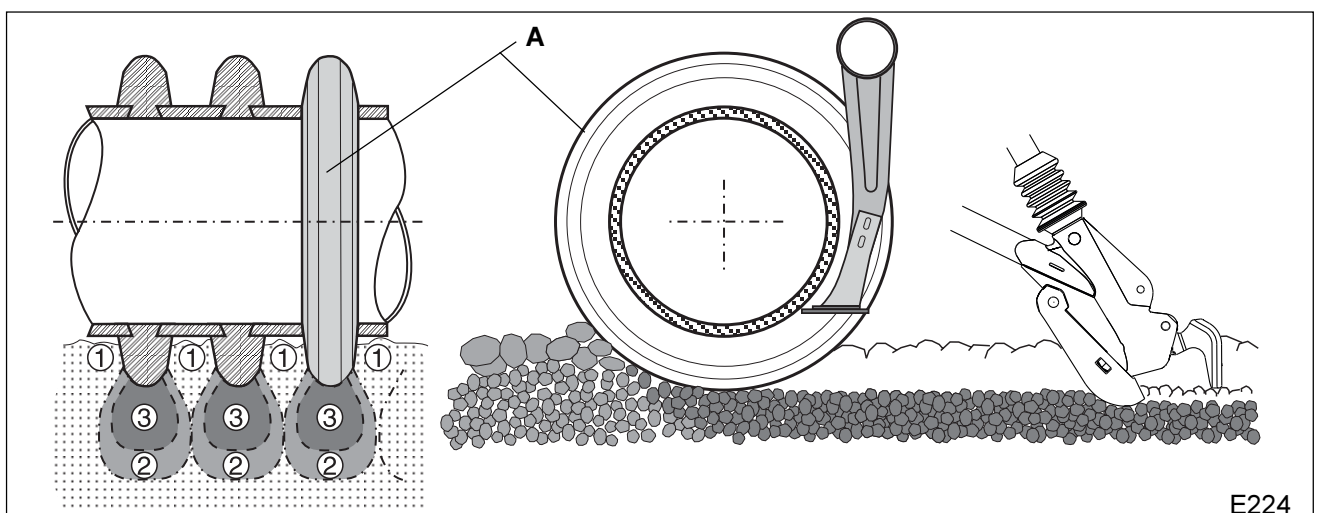


Fig. 2.3

E224

2.9 AMAZONE RoTeC-coulter

The AMAZONE RoTeC-disc coulter (Fig. 2.4) optimises the sowing accuracy, area efficiency, and life time when sowing after the plough and mulch sowing.

The steel disc (Fig. 2.4/1) 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. 2.4/2) which is attached to the steel disc carefully cleans the back of the disc. The molded lugs of the PU disc (Fig. 2.4/3) provide additional drive.

The PU-disc (Fig. 2.4/2) 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. 2.5, Item 1 – 3).

For deep sowing greater than 4 cm (Fig. 2.5, 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 non-corrosive steel disc and the PU-disc operate almost free from wear. The cast iron long life shoe can easily be exchanged by the removal of one Allen key bolt.

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

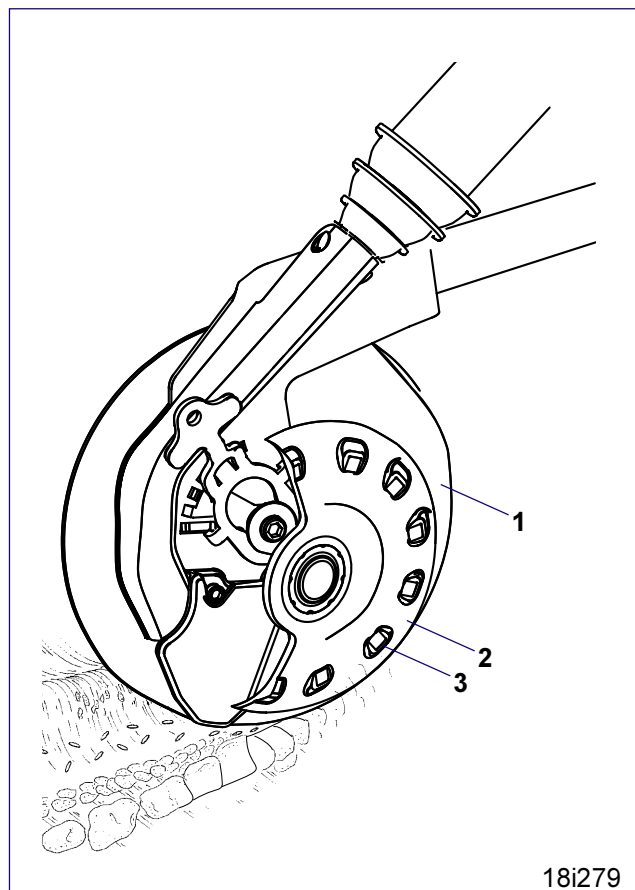


Fig. 2.4

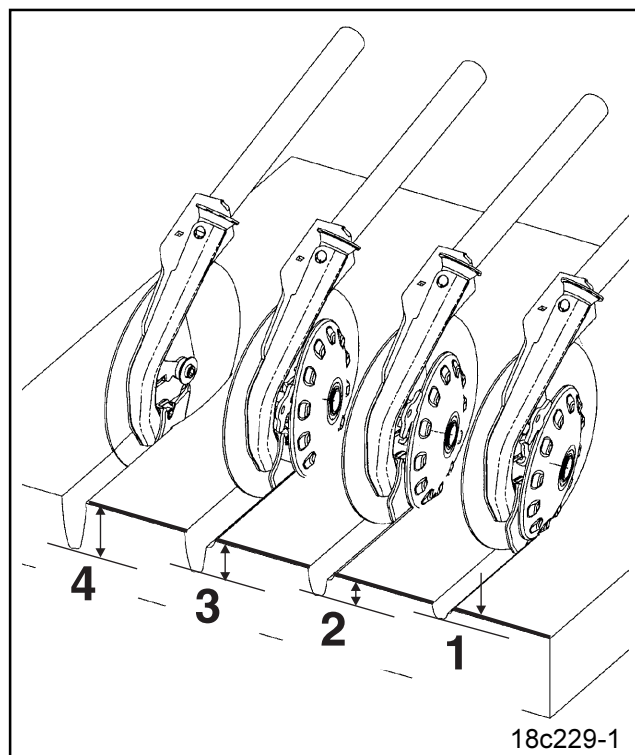


Fig. 2.5

2.10 Hydraulic circuit diagram D9

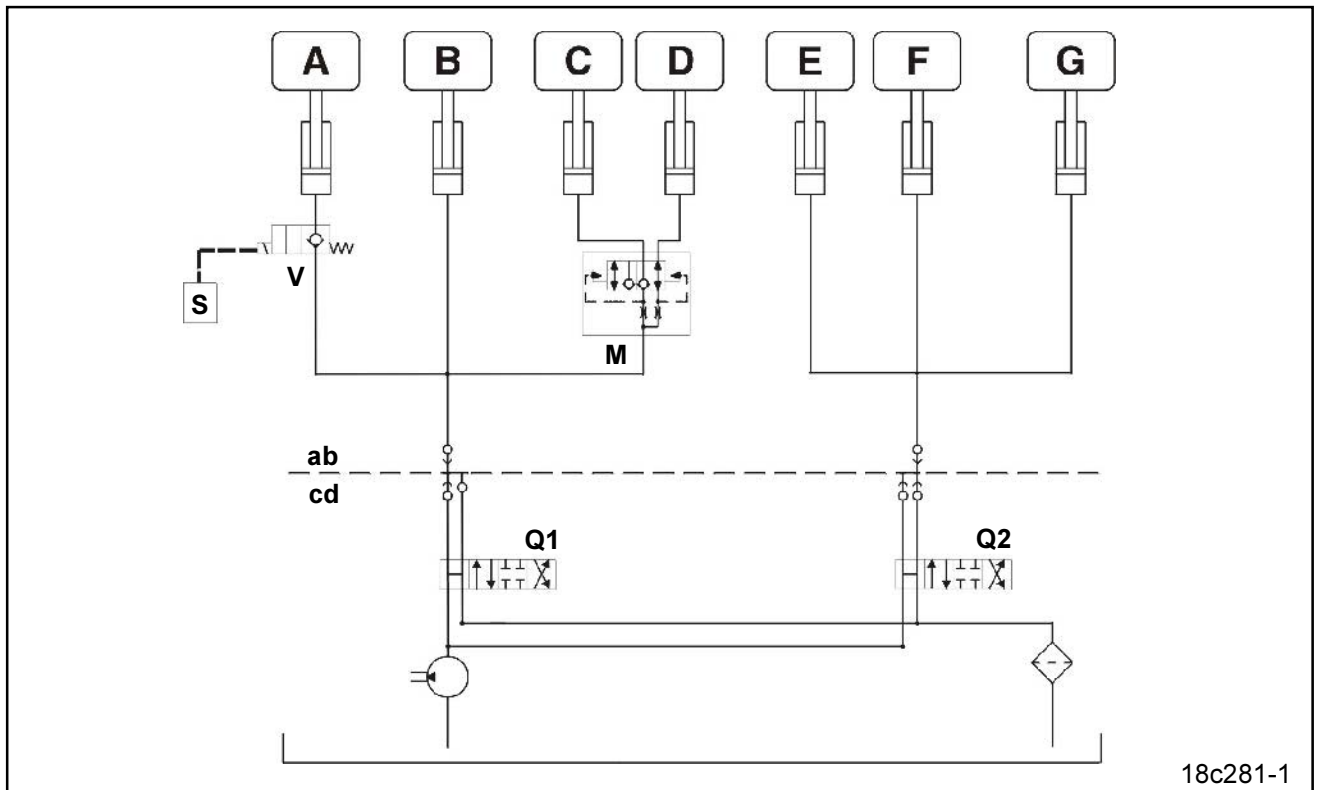


Fig. 2.6

Description

- ab = implement side
- cd = tractor side
- S = switch box

Hydraulic ram on tractor control valve Q1:

- A = tramline marker unit
- B = switch box
- C = track marker left hand side
- D = track marker right hand side

Hydraulic ram on tractor control valve Q2:

- E = coulter pressure adjustment
- F = extra coverage harrow adjustment
- G = seed rate remote control

Valves

- Q1, Q2 = 2 tractor control valves, illustrated in position "operation"
- M = track marker shuttle valve
- V = tramline marker 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's hydraulics!



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

2.11 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 vehicle used.



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

2.12 Declined use of the machine

The AMAZONE-seed drill D9 has been exclusively designed for the drilling of arable crop seeds commonly used in agriculture.

Any use other than that stipulated is no longer considered as designed use. Therefore the manufacturer will not, and does not accept any responsibility for damage resulting from unaccepted use. The operator himself will carry the full risk.

Under "designed use" the operator must adhere to the manufacturer's prescribed operation maintenance and repair conditions, and exclusively use original AMAZONE spare parts

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.



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

AMAZONE machines have been manufactured with great care, however, certain deviations from the seed rate or even a total failure of individual rows cannot totally be excluded.

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 bout
- 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
- incorrect drive R.P.M. and travelling speed
- incorrect setting of the machine (incorrect mounting, incorrect determination of the gearbox position).

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 safe operation under varying operational 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 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 affects.
- Danger to persons or to the environment by leaking hydraulic oil.

3.2 Qualification of operator

The machine described in this instruction manual 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.



General danger symbol (DIN 4844-W9)

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.



Attention symbol

The attention advice in this operation manual which may cause dangers for the machine and it's 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.

The machine's fixing points for the warning pictographs and hint signs are illustrated in Fig. 3.3 and Fig. 3.4. 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 place. (Picture-No. = Order-No.).

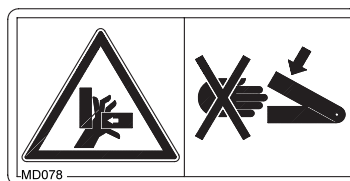


Fig. 3.1

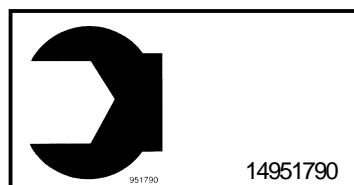


Fig. 3.2

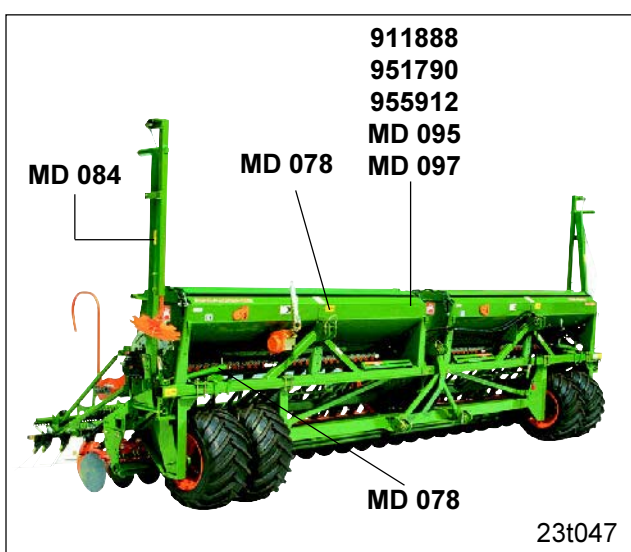


Fig. 3.3

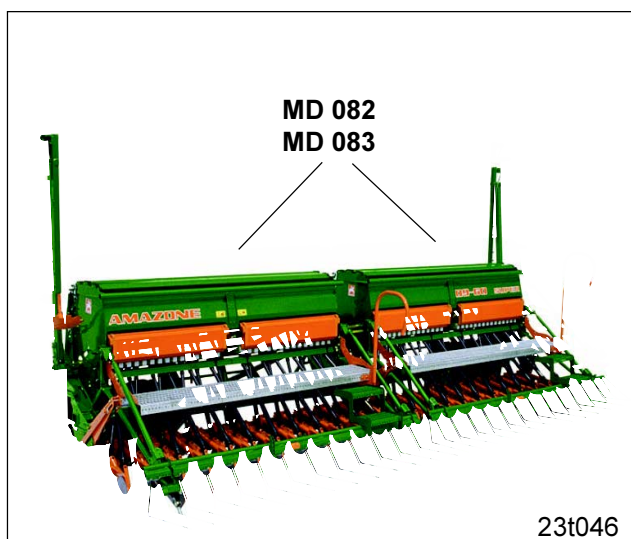
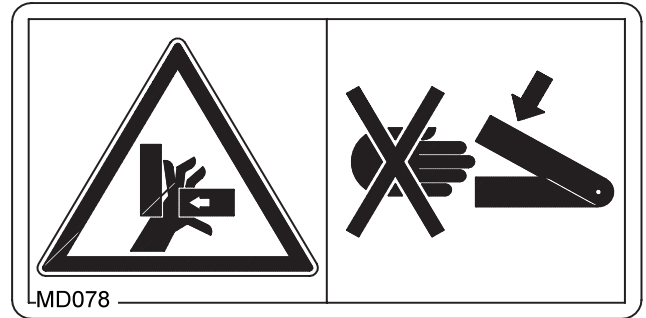


Fig. 3.4

Picture No.: MD 078
Explanation

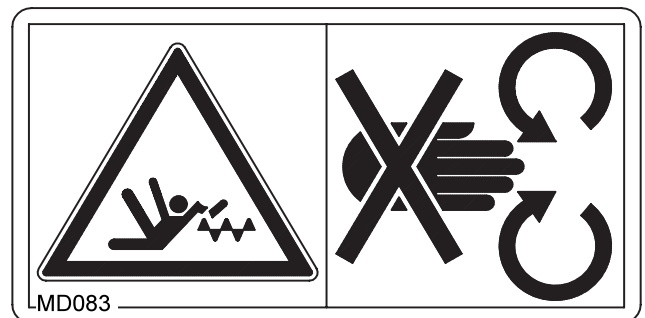
Never reach into the zone . There is danger of bruising as long as parts are still moving!
Advise persons to leave the danger zone!


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!

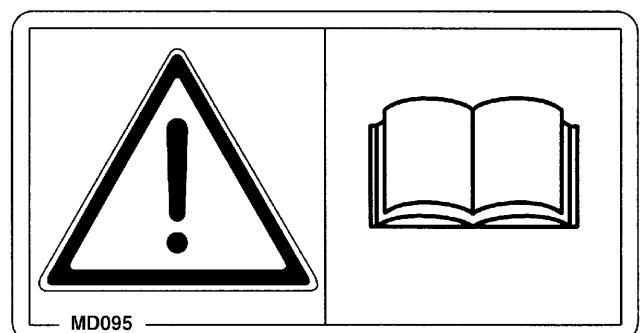


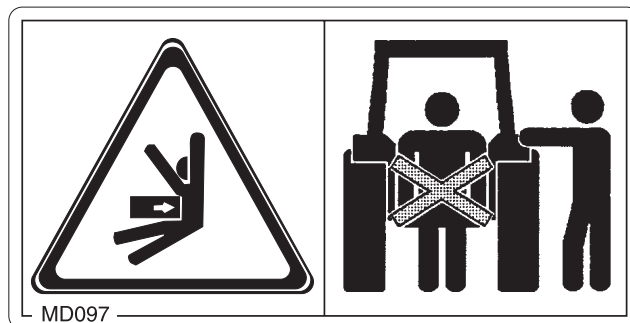
Bild-Nr.: MD 097

Explanation

Danger of bruising while standing between tractor and implement!

When coupling the combination to the tractor no persons may stay between tractor and machine.

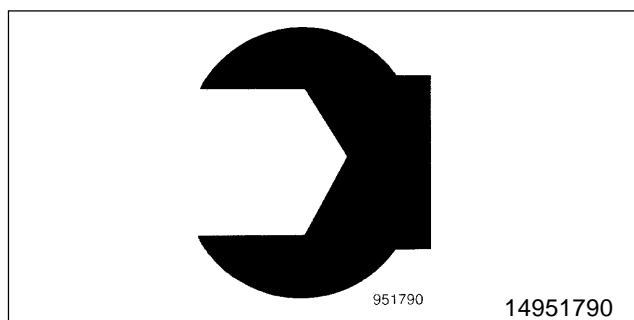
Do not stay between tractor and implement while actuating the three point linkage outside the tractor cab!



Picture No.: 951790

Explanation

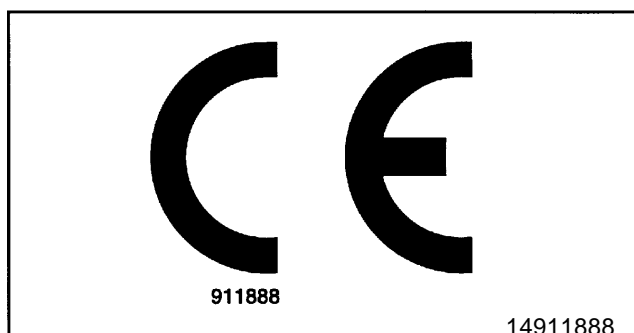
Retighten bolts after some hours of operation!



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!



Picture No.: 955912

Explanation:

The operational pressure of the hydraulic system must not exceed 200 bar!



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.

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 preventive 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 swiveling 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. 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 pressureless 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) 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 implement to the ground, switch off the engine, 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. Even 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 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!

3.6.6 General safety and accident prevention advice when retrofitting electric and electronic devices and/or components

The implement can be fitted with electronic components the function of which creates electro-magnetic transmittance during normal use. This may affect other implements. Such transmittance effects may cause danger for other people, when the following safety advice is not adhered to:

When retrofitting electric devices and/or components to the implement with connection to the on-board power supply, the user has to check for himself whether the installation may cause failure of the vehicle's electronic components or on other associated components.

Special attention has to be paid in order to ensure that the retrofitted electric and/or electronic parts correspond to the EMV-guide line 89/336/EEG in its valid edition and that the CE-sign is displayed.

4.0 Preparing for machine operation

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

When delivered the agitator drive shaft has been disconnected, to avoid damage to agitator shaft or drive line. The agitator shaft must not be connected with the drive when the rape insert is fitted inside the seed box. No other parts may be placed inside the seed box.

When supplied, the clip pin (Fig. 4.1/1), which creates the connection between drive and agitator shaft, is fixed in a hole of the auxiliary shaft on the outside of the gearbox (Fig. 4.1/2). Insert the clip pin (Fig. 4.2/1) into the gearbox hollow shaft (Fig. 4.2/2). Lift the machine via the tractors hydraulic three point linkage and turn the wheel until the clip pin can be inserted. Then the agitator shaft is connected with the drive.

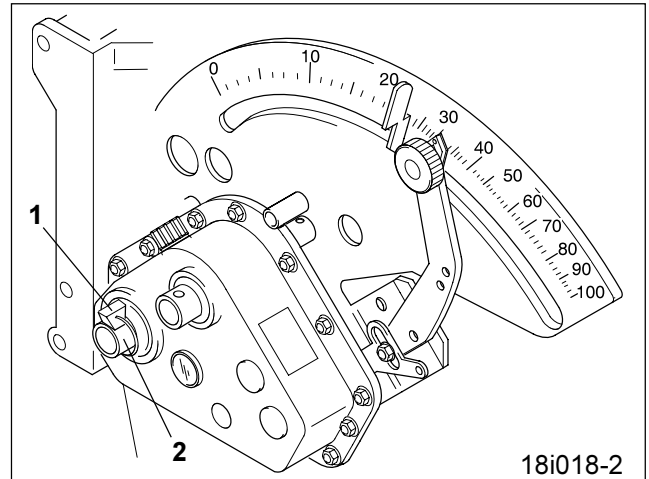


Fig. 4.1

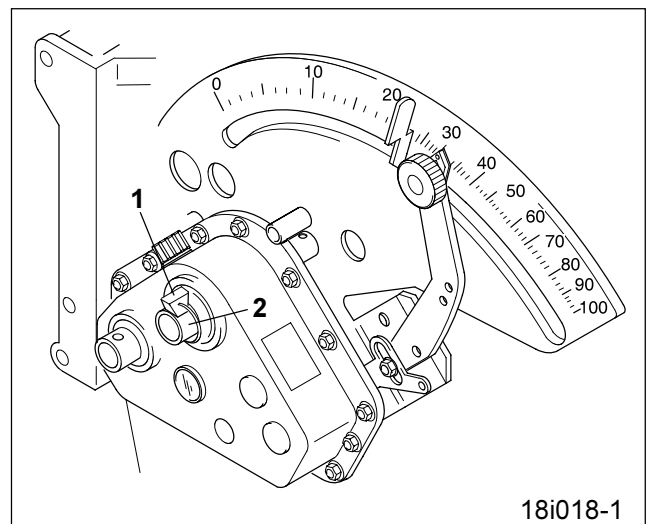


Fig. 4.2



Do not reach with your hands into the seed box! Danger of injury by moving parts!
The agitator shaft is also driven at gearbox position "0" or may also rotate when the clip pin (Fig. 4.2/1) had been pulled off the gearbox hollow shaft (Fig. 4.2/2)!



Never place any parts inside the seed box, as the agitator and the metering units may be damaged!
Danger of injury!

4.1 First fitting

Fit the loosely supplied parts to your seed drill:

- Extra coverage following harrow according to para. 14.1
- Loading board according to para. 15.1.

As standard the seed drill is equipped with tyres 31x15.50-15 (Mitas) (see Fig. 4.4). At random each axle can be equipped with two tyres of this size (see Fig. 4.5).

4.2 Preparing the seed drill for operation

- Coupling the seed drill to the tractor (please refer to para. 5.1).
- Check tyre air pressure (see para. 26.2)
- Connect coupling (Fig. 4.3/1), to which also the track marker shuttle valve is connected (Fig. 4.3/3) to a single acting control valve of your tractor. Together with the track marker shuttle valve (Fig. 4.3/3) the following hydraulic valves (if existing) are connected:
 - for actuating the track marker
 - inside the switch box of the tramlinign control
 - of the tramline marker unit.



Observe the safety advice according to para. 3.6.4!

Only actuate the control valve inside the tractor cab!

When actuating the control valves, the hydraulic rams for actuating the track markers, the switch box of the tramlinign control and the tramline marker unit are pressurised, depending on the switching position.

Ask people to leave the danger area!

Danger of injury from moving parts!

- Connect coupling (Fig. 4.3/2) of connecting unit II to a single acting control valve of your tractor. Connected are (if existing) the hydraulic rams for
 - the extra coverage following harrow pressure adjustment
 - the coulter pressure adjustment
 - the seed rate remote control.



Observe the safety advice according to para. 3.6.4!

Only actuate the control valve inside the tractor cab!

When actuating the control valve, the

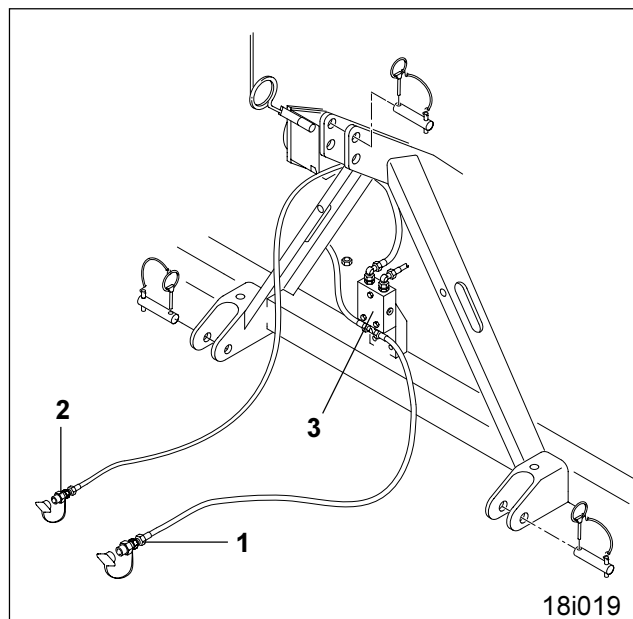


Fig. 4.3



Fig. 4.4



Fig. 4.5

hydraulic rams (if fitted) for
- **the extra coverage following harrow pressure adjustment**
- **the coulter pressure adjustment, and**
- **the seed rate remote control**
are pressurised simultaneously!
Advise persons to leave the danger area!
Danger of injury from moving parts!

- Filling the seed box (see para. 9.1)
- Set your seed drill according to the seed to be sown
(see para. 10.0)
- Determine the gearbox setting position for the desired seed rate (see Para. 11.0).



Check the hydraulic hoses before and during operation according to para. 26.8.1.

4.3 Setting up the machine in the field

- Bring markers into operating position (see Para. 12.2.).
- Set track markers to the correct length (see para. 12.4)
- Bring tractor wheel mark eradicators (special option) into operation position (see para. 23.1).
- Travel with your seed drill approx. 30 m in the field in the later forward speed and check the following settings:
 - Seed placement depth, readjust if necessary (see Para. 13.0)
 - Bring extra coverage following harrow into operation position and check settings (see Para. 14.2 ff)
 - Check working intensity of the marker discs, readjust if necessary.
 - Check working intensity of the wheel mark eradicators (special option), readjust if necessary.
- Set the markers in such a way that they mark on the correct side
- Set the metering wheel tramlining control to the correct figure in the switch box.
- Set hectare meter (special option) to "zero" (see separate instructions).

4.4 During operation

The seed level indicator (Fig. 4.6/1) shows the amount of seed remaining inside the seed box when the seed box lid is closed. If the seed level indicator approaches the "0"-mark, the seed box must be refilled.



Refill seed box in good time!

Never empty the seed box completely, otherwise differing sowing rates may result due to uneven seed distribution inside the seed box.



Fig. 4.6



Do not remain in the danger area between machine and the tractor. This is prohibited. Pay attention to the large protrusion of the track markers! Danger of injury

4.5 After the first 10 hours of operation

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

5.0 Coupling and uncoupling the seed drill



Couple your seed drill to the tractor before filling the seed box and only uncouple the seed drill with the seed box empty!



The maximum permissible tractor rear axle load, together with the maximum permissible total weight of the tractor must not exceed the tractor tyres maximum weight rating with a full seed box!
The front axle load of the tractor must be at least 20 % of the tractor net weight. Otherwise the tractor's stability and steering will not be sufficiently safe.

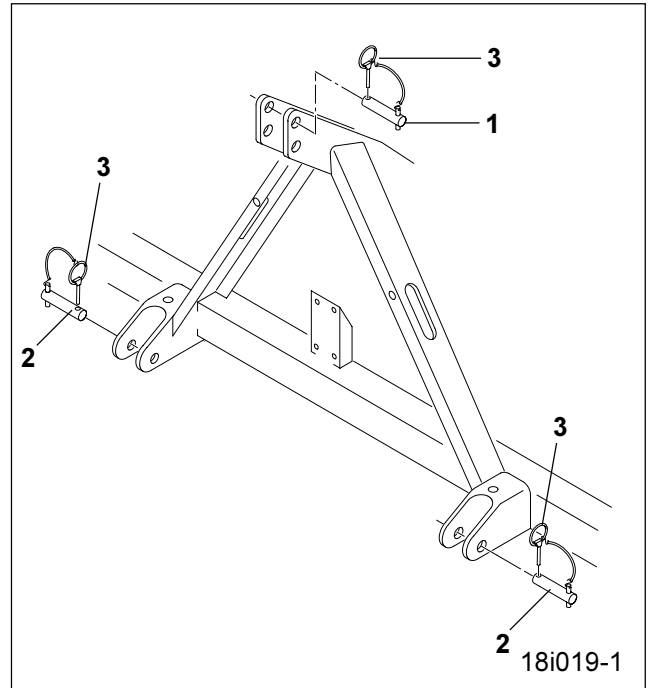


Fig. 5.1



Danger of being trapped and/or squeezed when working or reaching between tractor and implement!

When coupling the implement to the tractor do not allow anybody to stand between tractor and implement!

When actuating the three point linkage outside the tractor cab, do not stand between tractor and implement!

The warning pictograph attached to the implement (Fig. 5.2) illustrates the danger when working or standing between tractor and implement!

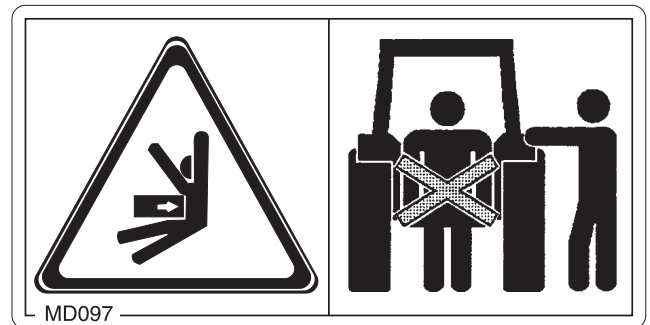


Fig. 5.2

5.1 Coupling the seed drill

Couple the seed drill to the tractor as usual or attach it with suited coupling parts to a pto-driven soil tillage implement or a trailed soil tillage implement.



Observe the safety advice for mounting implements to the tractor's three point hydraulic linkage according to para. 3.6.2!

Seed drills are equipped with top link pins (Fig. 5.1/1) and lower link pins (Fig. 5.1/2) of the cat. II type. The pins should be secured by clip pins (Fig. 5.1/3).

First set the length of the top link arm so that the seed drill will be level with the ground. The final setting of the top links length will be set in the field when setting the extra coverage following harrow.



The lower link arms of the tractor may only have a slight lateral play in order that the seed drill always travels centrally behind the tractor and does not sway to and fro in the raised position when turning at the headlands.

5.2 Uncoupling the seed drill

Before uncoupling the seed drill, empty the seed box.



Park your seed drill only with an empty seed box!

After uncoupling the seed drill, it rests on its coulters.

9.0 Seed box filling and emptying



Before filling the seed box, couple the seed drill to the soil tillage implement or tractor!



First empty the seed box before uncoupling the seed drill!

9.1 Filling the seed box

The seed box is filled from the rear of the seed drill. Open the seed box lid on its grip (Fig. 9.1/1).

If the seed drill is equipped with a loading board (special option), the seed box can easily be filled from the loading board.



When the seed box lid is opened, the floating ball (Fig. 9.2/1) of the seed level indicator (Fig. 9.2/2) is lifted. When filling the seed box, please note that no heavy items are placed on the floating ball of the seed level indicator.

Note during operation

The seed level indicator (Fig. 9.2/2) at the front wall of the seed box indicates the seed level inside the seed box with seed box lid shut. If the seed level indicator is nearing the "0" mark the seed box should be refilled.



The seed box should never be emptied completely as this may result in differing seed rates due to uneven distribution inside the seed box.



Fig. 9.1

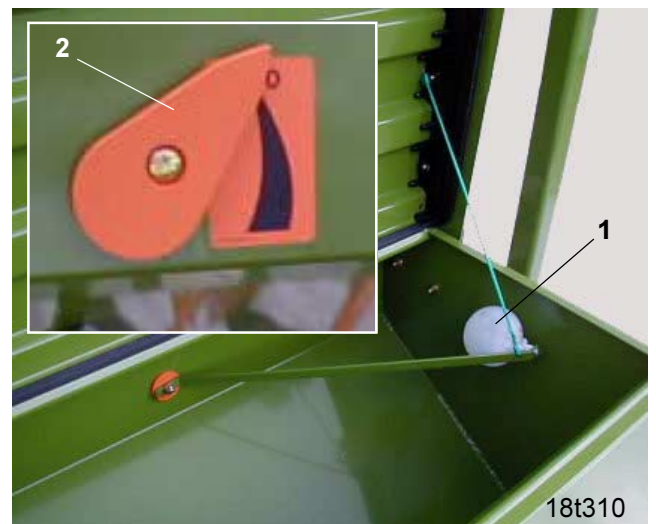


Fig. 9.2

9.2 Emptying the seed box

For emptying the seed box

- lower the coulter tube feed rail(s) (Fig. 9.3/1):
Every coulter tube feed rail is equipped with two levers (Fig. 9.3/2). Press them upwards to disengage the rails and then lower the coulter tube feed rail (Fig. 9.4).

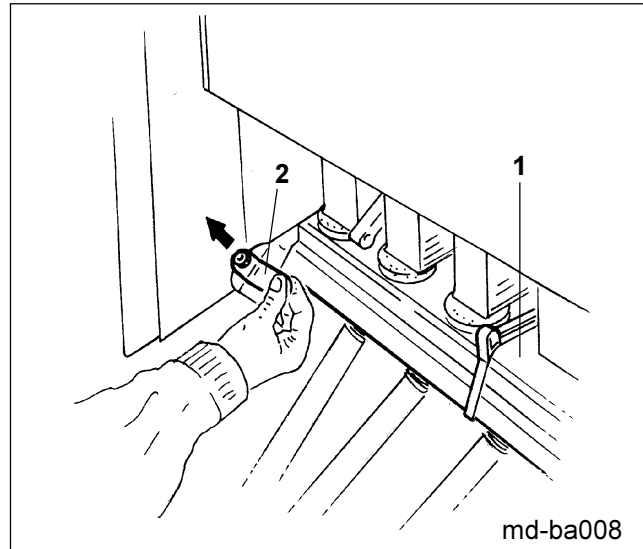


Fig. 9.3

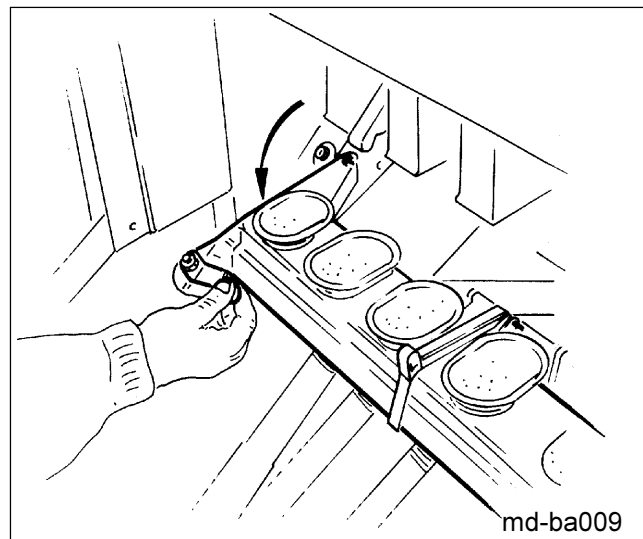


Fig. 9.4

- Pull the calibration trays (Fig. 9.5) upwards off their sliding retainers.
- Place the calibration trays (Fig. 9.6) on top of the coulter tube feed rail(s).
- Bring all shutter slides (Fig. 9.7/3) into position "open" (see para. 10.2) and swivel the bottom flap setting lever (Fig. 9.7/2) according to para. 10.3 by passing the quadrant plate lever downwards. Then the remaining seed will flow into the calibration trays. If the calibration trays are filled, close again the bottom flaps (Fig. 9.7/1) with the aid of the bottom flap setting lever (Fig. 9.7/2) and empty the calibration trays. Repeat this procedure until the seed box is empty.



Fig. 9.5



Fig. 9.6

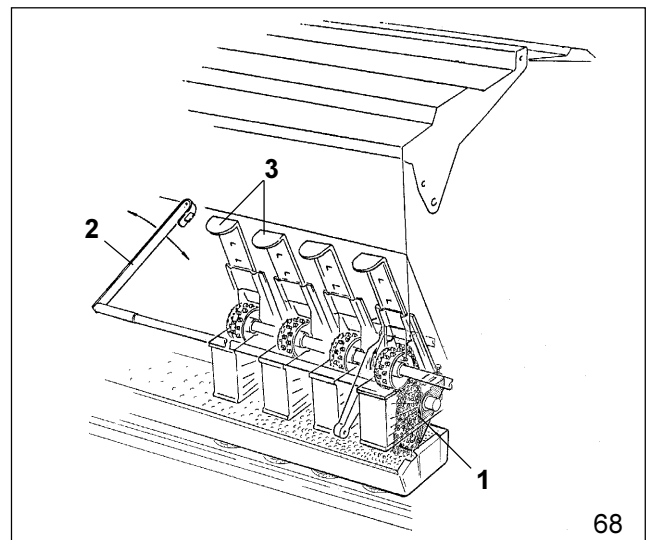


Fig. 9.7

10.0 Setting the seed drill for a particular seed

In the table (Fig. 10.1) you will find all setting values for the particular type of seed.

Seed	Elite-metering wheel	Shutter slide position	Bottom flap position		Agitator shaft
			TGW less than	TGW more than	
			6g (rape) 50g (grain)		
Rye	Normal metering wheel	open	1	2	driving
Triticale	Normal metering wheel	open	1	2	driving
Barley	Normal metering wheel	open	1	2	driving
Wheat	Normal metering wheel	open	1	2	driving
Dinkel	Normal metering wheel	open	2		driving
Oats	Normal metering wheel	open	2		driving
Rape	Fine seed metering wheel	$\frac{3}{4}$ open	1	2	disengaged
Mustard/oil radish	Fine seed metering wheel	$\frac{3}{4}$ open	1		disengaged
Phacelia	Normal metering wheel	$\frac{3}{4}$ open	1		driving
Phacelia	Fine seed metering wheel	$\frac{3}{4}$ open	1		driving
Stubble turnip	Fine seed metering wheel	$\frac{3}{4}$ open	1		disengaged
Grass	Normal metering wheel	open	2		driving
Beans small (TGW up to 400g)	Normal metering wheel	$\frac{3}{4}$ open	4		driving
Beans, large (TGW up to 600g)	Bean metering wheel	$\frac{3}{4}$ open	3		driving
Beans, large (TGW more than 600g)	Bean metering wheel	$\frac{3}{4}$ open	4		driving
Peas	Normal metering wheel	$\frac{3}{4}$ open	4		driving
Flax (dressed)	Normal metering wheel	$\frac{3}{4}$ open	1		driving
Millet	Normal metering wheel	$\frac{3}{4}$ open	1		driven
Lupine	Normal metering wheel	$\frac{3}{4}$ open	4		driven
Lucerne	Normal metering wheel	$\frac{3}{4}$ open	1		driven
Lucerne	Fine seed metering wheel	$\frac{3}{4}$ open	1		driven
Oil linen (Linseed) (dressed moist)	Normal metering wheel	$\frac{3}{4}$ open	1		disengaged
Oil linen (Linseed) (dressed moist)	Fine seed metering wheel	$\frac{3}{4}$ open	1		disengaged
Red clover	Fine seed metering wheel	$\frac{3}{4}$ open	1		disengaged
Soya	Normal metering wheel	$\frac{3}{4}$ open	4		driven
Sunflowers	Normal metering wheel	$\frac{3}{4}$ open	2		driven
Vetches	Normal metering wheel	$\frac{3}{4}$ open	2		driven

Fig. 10.1

t189gb01



For some seeds two setting values are given for the bottom flap setting levers, i. e. seeds with a 1000 grain weight (TGW) up to 50 g and of more than 50 g!



For seeds which have not been mentioned in the table, please refer to a seed with a similar grain size.

10.1 Elite-metering wheels

As standard AMAZONE-seed drills are equipped with Elite-metering wheels (Fig. 10.2) Elite-metering wheels are composed of the main seed metering wheel (Fig. 10.2/1) and the fine seed metering wheel (Fig. 10.2/2).



Please take the required seed metering wheel from the table (Fig. 10.1).

10.1.1 Sowing with main seed metering wheels

For sowing with main seed metering wheels, the main seed metering wheel and the fine seed metering wheel are combined. Both rotate.

If, after having sown with the fine seed metering wheels, it is desired to use the main seed metering wheels again, proceed as follows:

- Turn the main seed metering wheel (Fig. 10.2/1) on the seed shaft until the pin in the metering wheel can be seen.
- Press at every seed metering wheel the pin against the fine seed metering wheel as illustrated in Fig. 10.3. Then check for correct connection by attempting to rotate one half against the other!

10.1.2 Sowing with the fine seed metering wheel

For sowing with the fine seed metering wheels, slacken the connection of main seed metering wheel and fine seed metering wheel at every seed metering wheel:

- Move the gearbox setting lever (Fig. 11.1/2) repeatedly up and down until the holes (Fig. 10.4/1) of the fine seed metering wheels are visible.
- At every seed metering wheel press the pin behind the hole until the stop into the main seed metering wheel until the main seed metering wheel can rotate freely on the seed shaft. Then check free wheel drive!

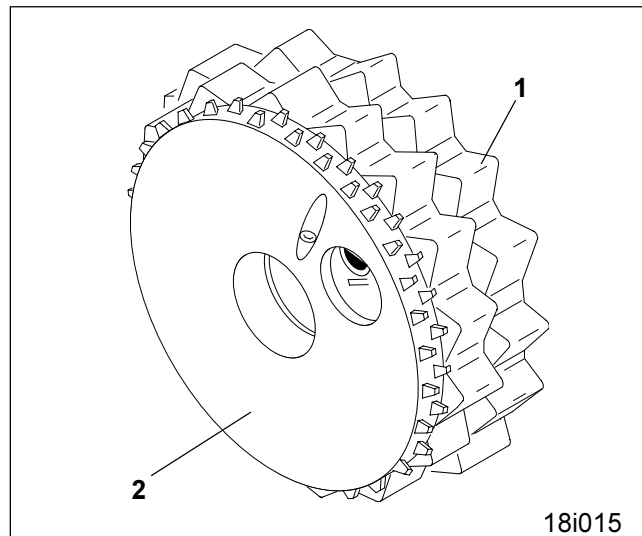


Fig. 10.2

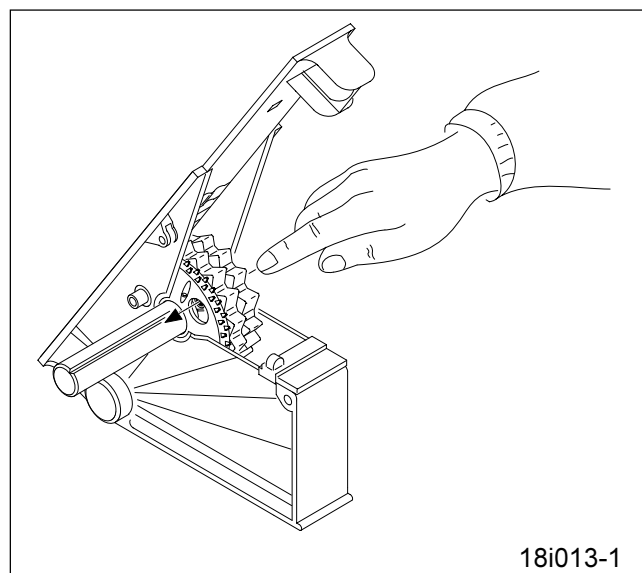


Fig. 10.3

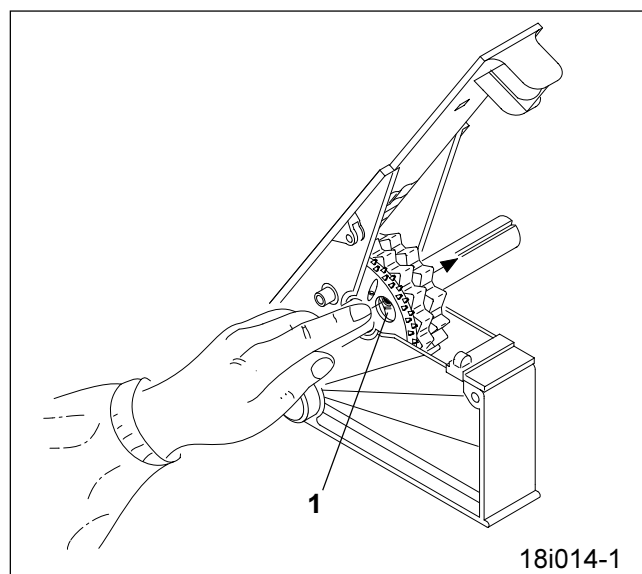


Fig. 10.4

10.2 Setting the shutter slide

The shutter slides of the seed housings can be brought into three positions (see Fig. 10.5):

- A = shut
- B = 3/4 open
- C = open



Take the required shutter slide position from the table and set the shutter slides accordingly!



Shut the shutter slides on the seed housings not needed!

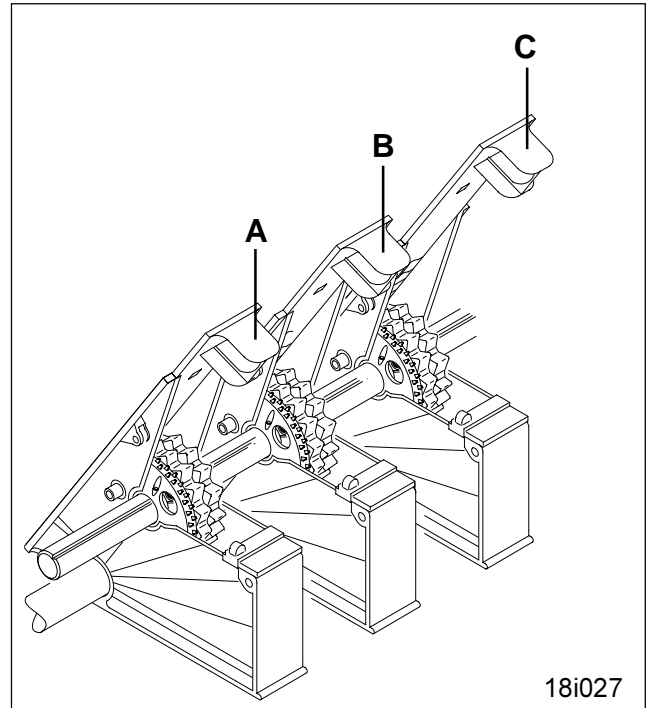


Fig. 10.5

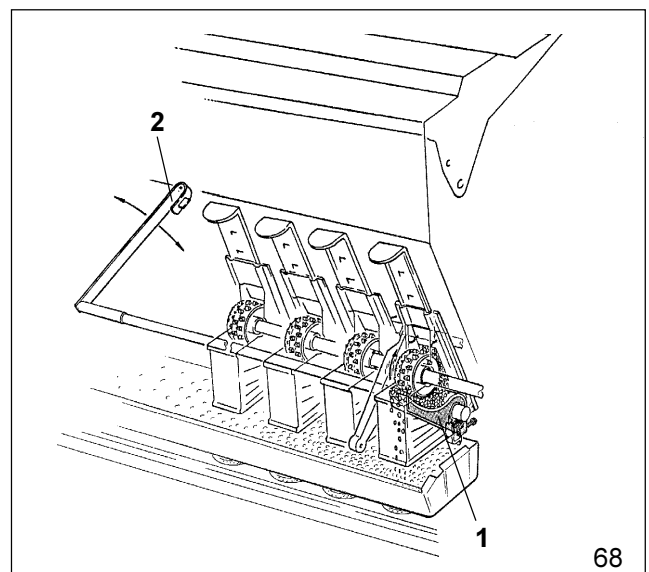


Fig. 10.6

10.3 Setting the bottom flaps

Set the bottom flaps (Fig. 10.6/1) centrally with the bottom flap setting lever (Fig. 10.6/2).

On seed drills with 3.0 m and 4.0 m working width the bottom flap setting lever (Fig. 10.7/1) can be found in the centre at the rear of the seed drill. The bottom flap setting lever can be set in 8 positions in a quadrant plate (Fig. 10.7/3). Secure every setting by using a clip pin (Fig. 107/2).



Take the required position of the bottom flap setting lever from the table (Fig. 10.1) and set the bottom flap setting lever accordingly.

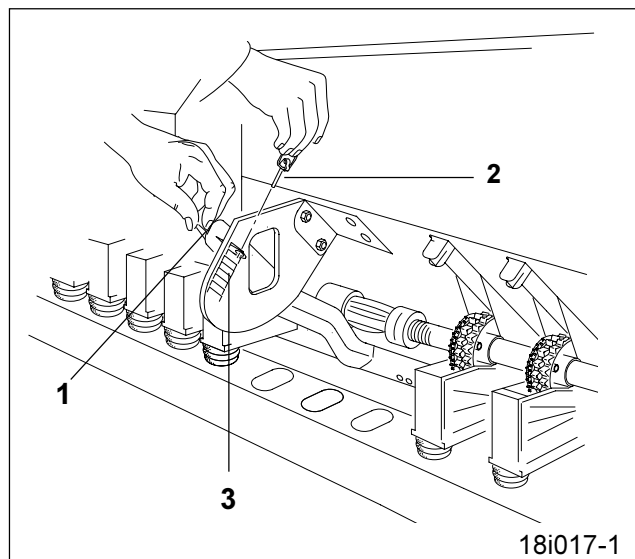


Fig. 10.7

10.4 Agitator shaft

The agitator shaft (Fig. 10.8/1) prevents seed blockages inside the seed box which may cause incorrect seed rates.

For sowing certain seeds, the agitator shaft should, however, be disengaged.

Especially when sowing rape the intensive agitation of the agitator shaft may cause seed damage, resulting in the rape seed sticking together. Therefore, when sowing e. g. rape or similar small seed, the drive of the agitator shaft should be disengaged (see below).



Please take from the table (Fig. 10.1), which seeds should be sown with the agitator shaft disengaged and set the agitator shaft accordingly.



Fig. 10.8

10.4.1 Disengagement of agitator shaft drive

Pull the clip pin (Fig. 10.9/1) out of the gearbox tubular shaft (Fig. 10.9/2) and insert into the hole of the auxiliary shaft as illustrated. Hereby the drive of the agitator shaft is disengaged.



After sowing do not forget to re-engage the agitator shaft. Otherwise seed rate errors may occur, especially when sowing seeds which are not free flowing.

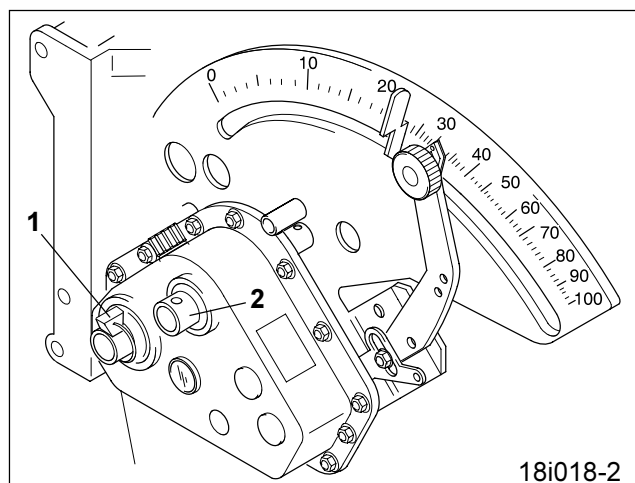


Fig. 10.9

10.4.2 Connect the agitator shaft with the drive

The agitator shaft will be driven when the clip pin (Fig. 10.10/1) is inserted in the gearbox tubular shaft as illustrated. Turn the drive wheel with your seed drill slightly lifted until the clip pin can be inserted.

10.5 Sowing peas

Sowing round, easily flowing peas.

Peas having the shape and size as illustrated in Fig. 10.11 can be sown with the main metering wheels. In general, these peas flow well. Therefore we recommend to disengage the agitator shaft.

Sowing "square", not free flowing peas

"Square" peas having the shape and size as illustrated in Fig. 10.12 can be sown with the main seed metering wheels. As these peas do not flow well and tend to bridge inside the seed box, the agitator shaft should be engaged during the sowing operation.

10.5.1 Advice for sowing peas

Peas can be sown using normal seed wheels without any problems.

The cam shape of the normal seed wheels is designed in such a way that the peas easily drop out of the seed wheel even at high seed rates and fast forward speed.

When sowing peas of an unfavourable shape which have been treated with special kinds of seed dressers it may happen that they are not dropping out of the seed wheel but return into the seed box. this may result in damage on seed housings and seed wheels. This danger is remedied by fitting fine seed wheel brushes (Fig. 10.13) on all seed housings.



We therefore recommend to equip all seed housings with fine seed wheel brushes!

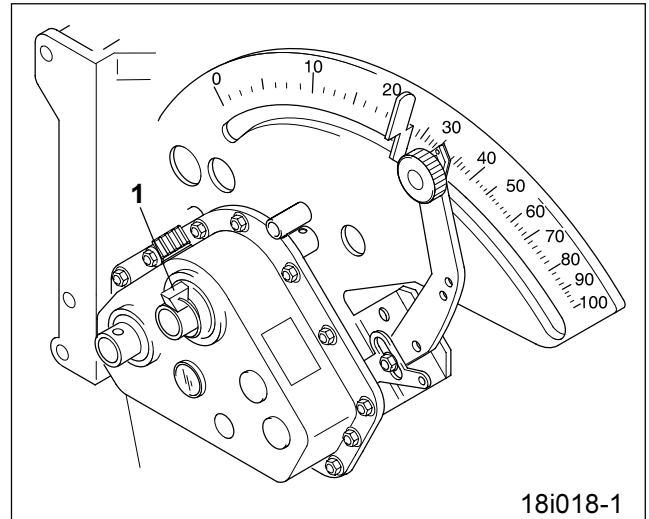


Fig. 10.10

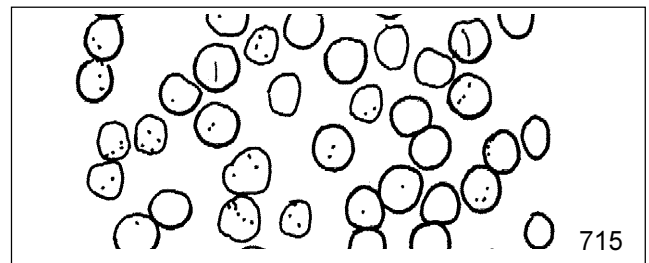


Fig. 10.11

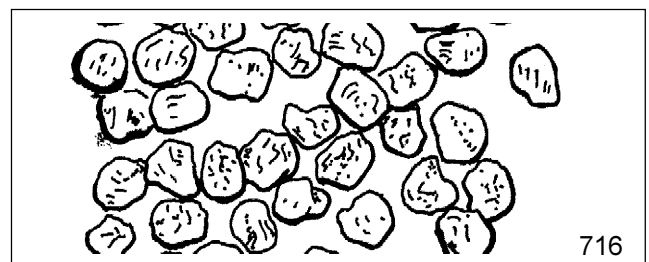


Fig. 10.12

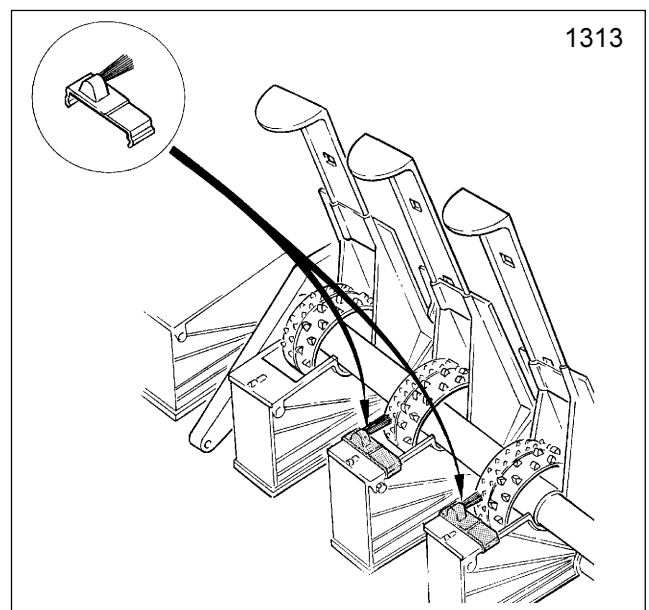


Fig. 10.13

10.6 Sowing beans with AMAZONE-seed drills D9/AD03

Sowing beans

up to a thousand grain weight (TGW) of about 400 g

Beans up to a 1000 grain weight (TGW) of about 400 g which have the shape and size as illustrated (Fig. 10.15) may be sown without any problems with the normal metering wheel. The agitator shaft must rotate when sowing these beans.

Sowing beans

of a thousand grain weight (TGW) above 400g
with bean seed metering wheels (optional)

To avoid damage on seed metering housings and normal seed metering wheels large beans (TGW above 400 g) with shape and size as illustrated in Figure (Fig. 10.16) may only be sown with bean seed metering wheels (Fig. 10.14). The flexible wings of the bean metering wheels provide an even seed delivery and convey the beans very carefully. Whilst sowing the agitator shaft must be engaged.

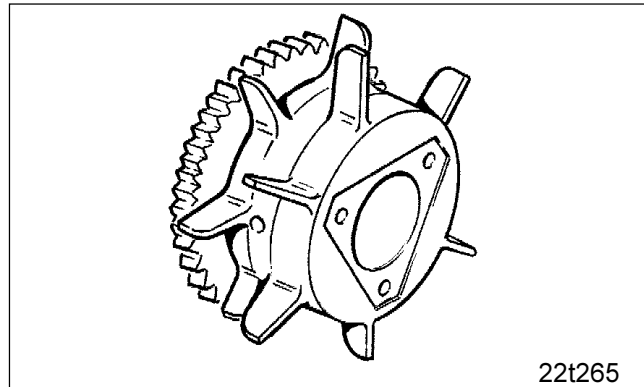


Fig. 10.14



Fig. 10.15

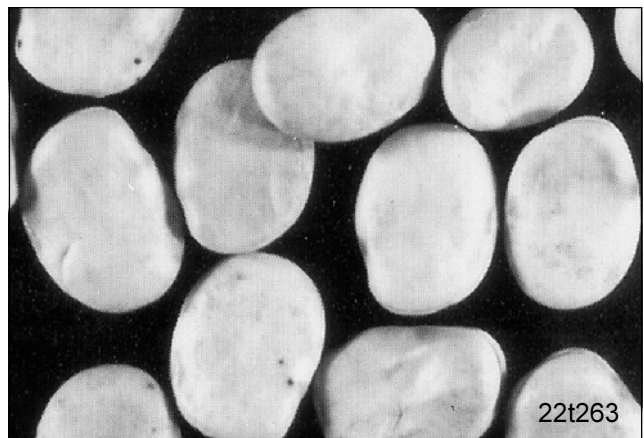


Fig. 10.16

10.6.1 Fitting the bean seed metering shaft

The bean seed metering wheels can be piece by piece exchanged for the normal seed metering wheels. However, it is of advantage to pre-assemble the bean seed metering wheels to a second seed shaft. Then only the seed shafts must be exchanged. The centrally split seed shafts allow a quick exchange.

- Remove the calibration tray carrier (Fig. 10.17/1)
- slacken the tensioning springs (Fig. 10.18/1) and fold down the counter shaft of the seed wheel tramline control (if existent) together with the swivel bearings (see Fig. 10.19).

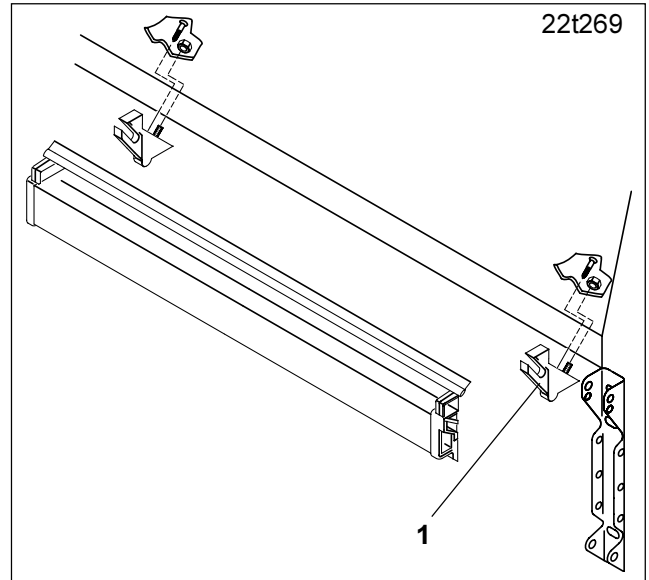


Fig. 10.17

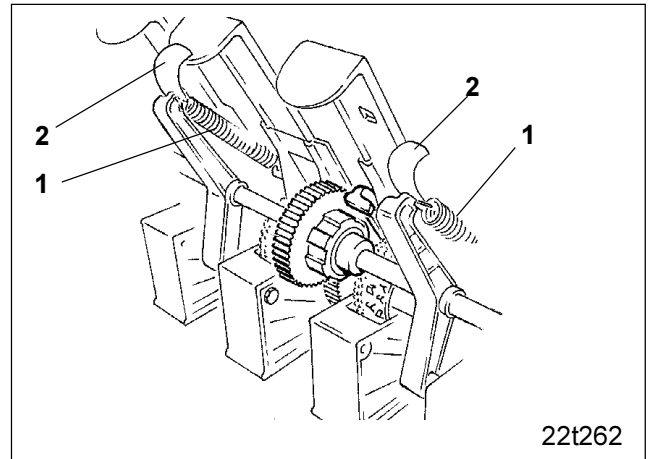


Fig. 10.18

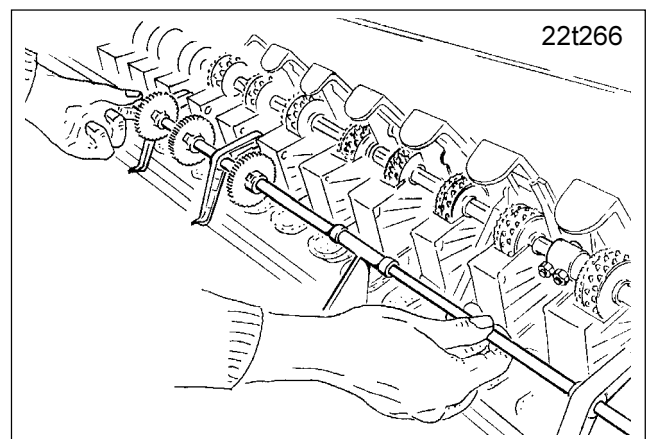


Fig. 10.19

- A bracket (Fig. 10.20/1) which axially secures the counter shaft catches into a gap on the metering wheel housing. This bracket is pulled out of the gap when folding down the counter shaft.
- Slacken the tensioning springs and remove the pressure bearings (Fig. 10.21/1).
- Slacken the hex. bolts and move the connection bushes (Fig. 10.22/1) on the seed shaft. Disengage the seed shaft clutch and remove the seed shaft with the seed metering wheels starting on the right hand seed shaft half (Fig. 10.23).

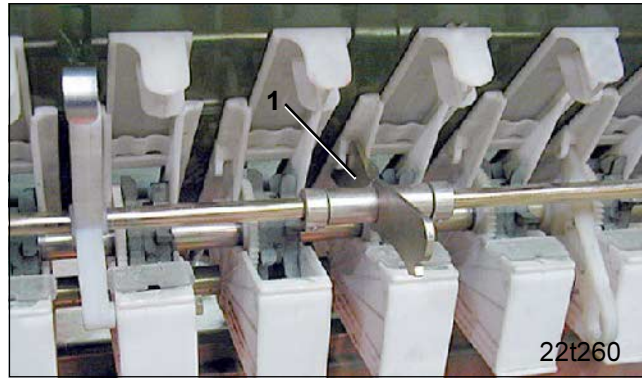


Fig. 10.20



Do not remove the notched plate for the bottom flap!

- Fitting the been seed metering shaft is done in vice versa order.

If no tramlines shall be created, the counter shaft (Fig. 10.19, if existent) may not be folded upwards and shall not catch.

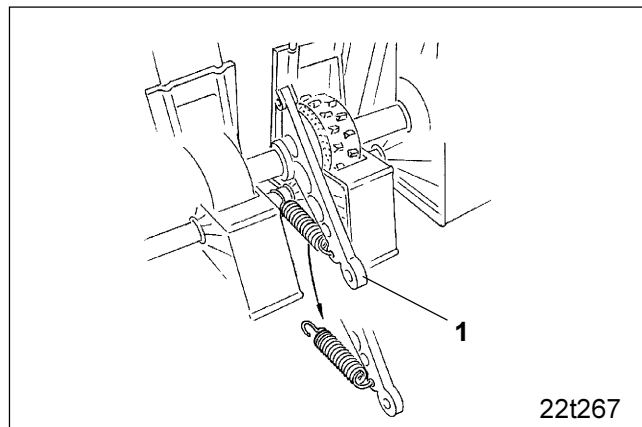


Fig. 10.21

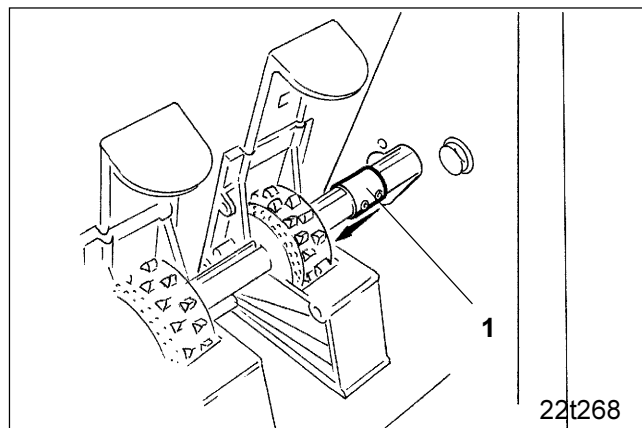


Fig. 10.22

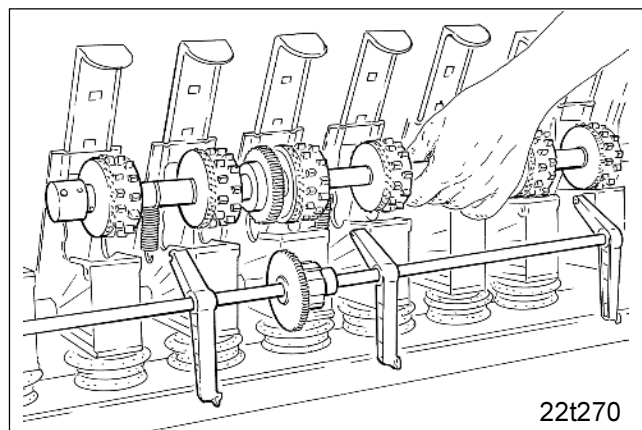


Fig. 10.23

10.6.2 Creating tramlines with bean seed metering wheels

If it is intended to create tramlines with the seed drill equipped with bean seed metering wheels,

- mount the supplied chain wheel (Fig. 10.24/1) on the bean seed metering shaft before attaching the bean seed metering wheel.
- remove the three square driver of the bean seed metering wheels which catch into the gaps of the seed shaft on such bean seed metering wheels which will later on be disengaged for creating tramlines.
- turn the axial securing (Fig. 10.25/1) so that the short arm rests in the gap of the seed housing.

If the seed drill is reset to normal seed metering wheels reverse the axial securing and insert the long arm (Fig. 10.25/23) into the gap of the seed metering housing.

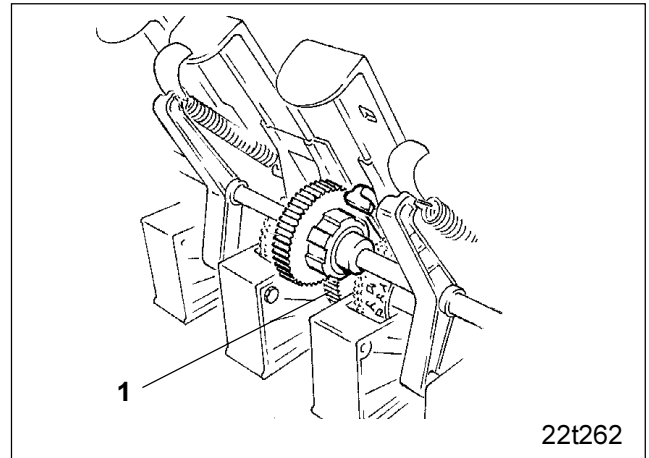


Fig. 10.24

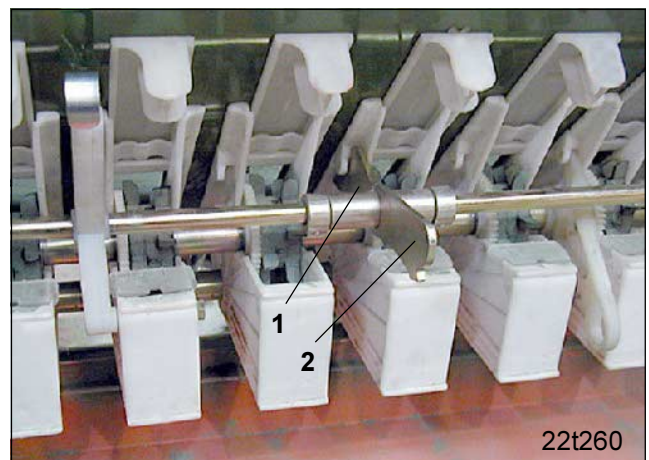


Fig. 10.25

11.0 Determining the gearbox setting for the desired seed rate (Calibration test)

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 steplessly. 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 alteration to the gearbox setting lever a calibration test should be carried out to confirm that the seed drill is sowing the desired seed rate

This calibration test should also be re-checked

- when the setting of the shutter slides had been changed
- when the setting of the bottom flap is changed
- when changing from normal seed metering wheels to fine seed metering wheel or vice versa.
- when the agitator shaft is disengaged or engaged again.
- before sowing a new supply of seed (reason: deviations in grain size, grain shape, bulk density and dressing agent).

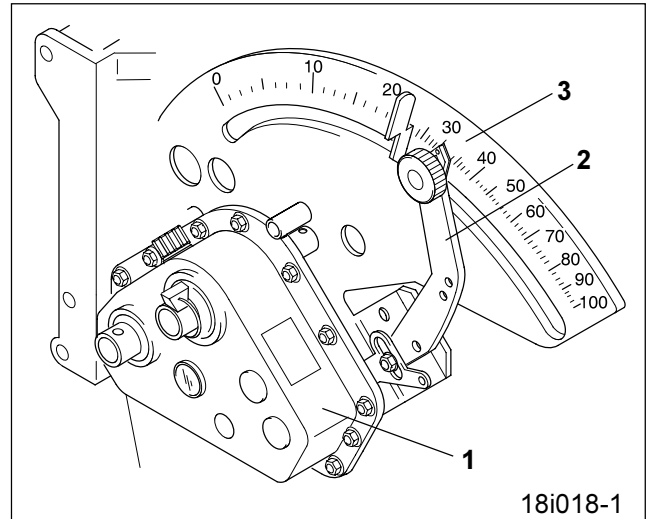


Fig. 11.1

Set your seed drill according to para. 10.0.

Add at least half the capacity of the seed hopper with seed.

Lower the seed funnel chute(s) (Fig. 11.2/1):

For a short moment pull out the two, spring loaded locking levers (Fig. 11.2/2) with which every seed funnel chute is equipped and lower the seed funnel chute (Fig. 11.3).

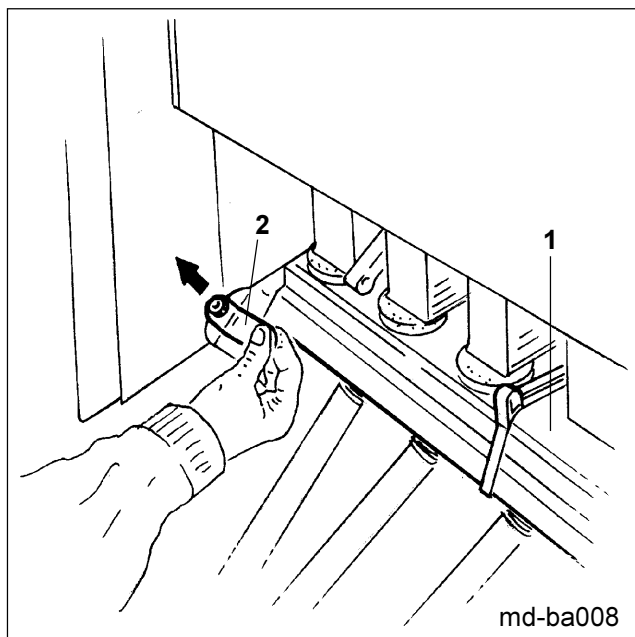


Fig. 11.2

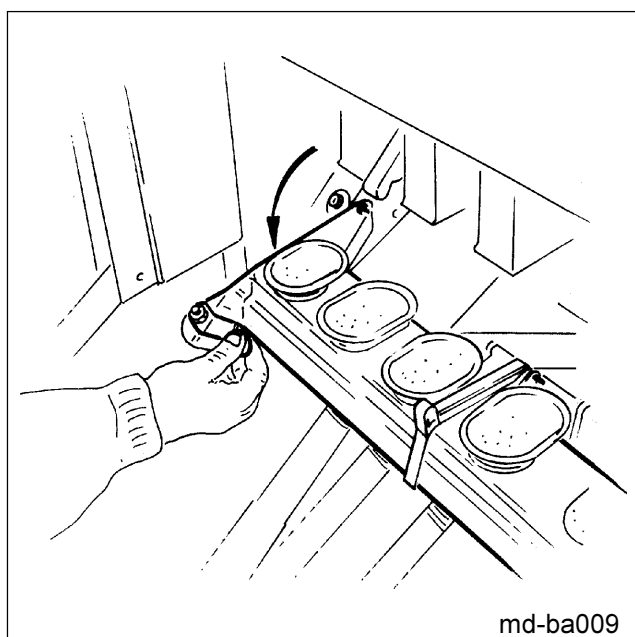


Fig. 11.3

Pull calibration trays (Fig. 11.4/1) in upward direction out of the retainers.

Place calibration trays (Fig. 11.5) on the seed funnel chute(s).



Before carrying out the calibration test, ensure that the tramline device (if fitted, see para. 18) (Fig. 11.6/1) shows any figure but ZERO. If ZERO ("0") is showing, advance the system to indicate "1", otherwise no seed will be delivered by the tramline seed wheels.



Fig. 11.4



If your seed drill is equipped with the hydraulic seed rate remote control, set the seed rate as described in para. "hydraulic seed rate remote control".



Fig. 11.5

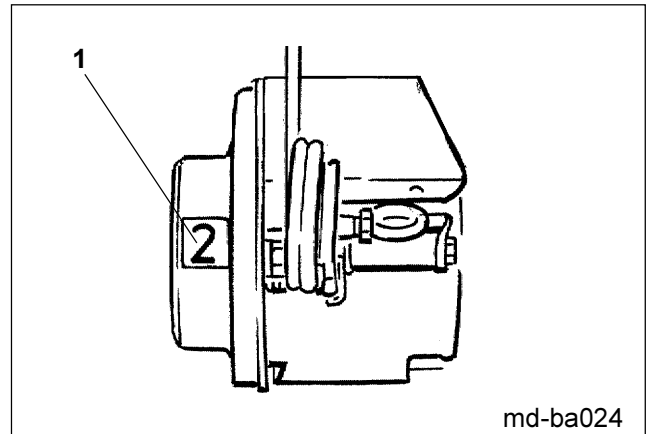


Fig. 11.6

Slacken the star knob (Fig. 11.7/1) on the gearbox setting lever.

Slide the gearbox setting lever (Fig. 11.7/2) from below to the following gearbox setting:

**For sowing
with normal metering wheels:
gearbox setting "50"**

**For sowing
with fine seed metering wheels:
gearbox setting "15"**

Firmly tighten star knob (Fig. 11.7/1).

Take the calibration crank in your hand. You will find the calibration crank (Fig. 11.8/1) in a retainer (Fig. 11.8/2) on the front right hand side below the seed box.

Raise your seed drill, e. g. with the tractor hydraulics, until the wheels can rotate freely. Insert the calibration crank (Fig. 11.9/1) into the square tube on the right hand wheel.

Residues of dressing agents on bottom flaps (Fig. 11.10/1) and seed metering wheels (Fig. 11.10/2) may affect the flowing properties of the seed and thus may change the seed rate. To ensure that the setting of the seed rate will be carried out in similar conditions as the actual sowing, these residues should already exist before calibrating and setting the seed rate.

To do this, crank the seed drill wheel units until the seed flows from all seed housings (Fig. 11.10/3) into the calibration trays (Fig. 11.10/4).

Fill the calibration trays (Fig. 11.10/4) fully once by turning the calibration handle (Fig. 11.9/1) (for fine seeds 200 crank turns will be sufficient).

Empty the calibration trays (Fig. 11.10/4) into the seed box and replace on the seed funnel chute(s) (Fig. 11.10/5).

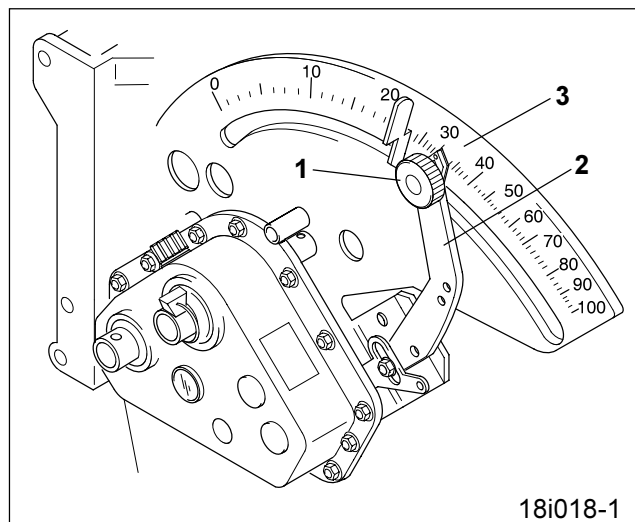


Fig. 11.7

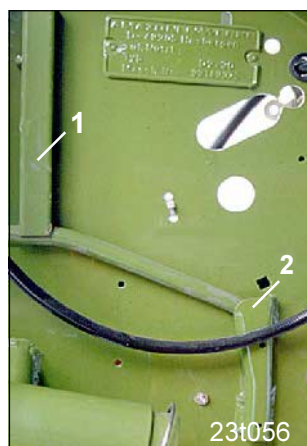


Fig. 11.8



Fig. 11.9

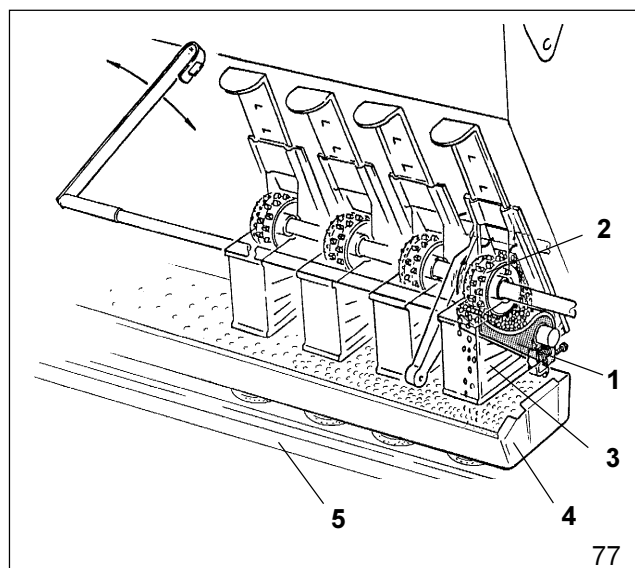


Fig. 11.10

Turn the seed drill wheel (Fig. 11.11) with the number of crank turns indicated in table (Fig. 11.12) in clockwise direction.

The number of crank turns depends on the working width and tyre size with which your seed drill has been equipped.

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

All the seed charts are calculated in the number of crank turns for 1/40 ha. In case of very small seed rates, e. g. for rape or when using balances with wide increment scale, it is recommended to conduct the crank turn for 1/10 ha.



Fig. 11.11

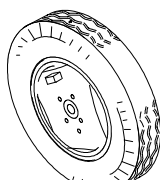

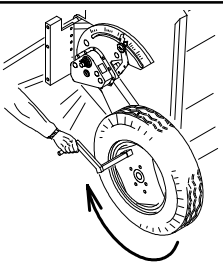
958948  Tyres	 Working width	 Number of crank turns on the wheel	
		1/40 ha	1/10 ha
5.00 - 16	2,5 m	49,5	197,0
	3,0 m	41,0	164,0
6.00 - 16	2,5 m	46,0	185,0
	3,0 m	38,5	154,0
10.0/75-15	3,0 m	37,0	149,0
	4,0 m	28,0	112,0
31x15.50-15 - MITAS -	3,0 m	37,0	149,0
	4,0 m	28,0	112,0
	6,0 m	18,5	74,5

Fig. 11.12

t2006gb02

Weigh the seed collected in the calibration tray (Fig. 11.13/1) (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 rate [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 rate 3,2 kg

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



The desired seed rate usually is not obtained after the first calibration test. However, with the aid of the disc rule according to para. 11.1 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.



When your seed drill is equipped with the hydraulic seed rate remote control, determine the gearbox setting with the aid of a pressurised hydraulic ram for an increased seed rate.

When you have determined the correct gearbox setting

- Insert the calibration crank (Fig. 11.8/1) into the retainer
- Fix the calibration tray(s) (Fig. 11.4/1) to the seed box
- Slide the funnel chute(s) (Fig. 11.2/1) upwards until it (they) catch(es) audibly.
- Bring land drive star wheel into working position.

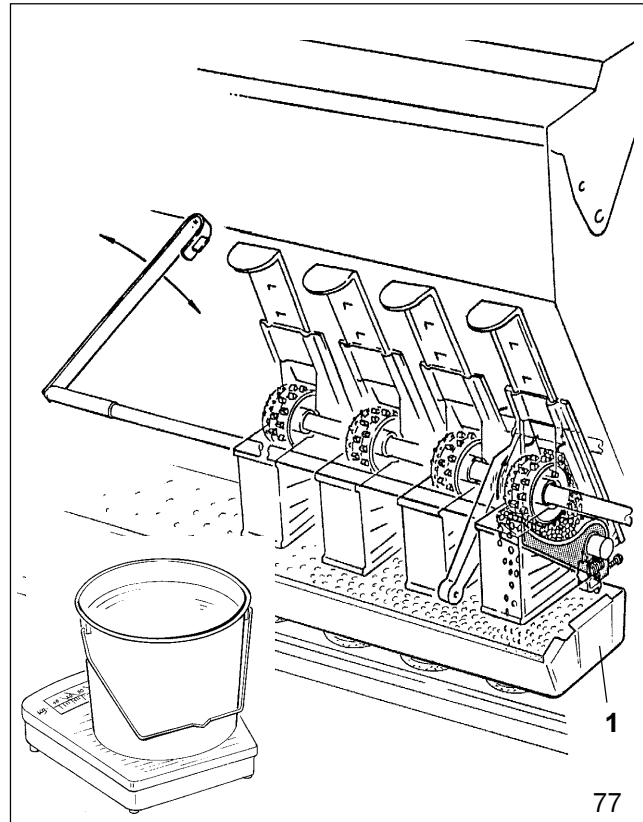


Fig. 11.13

11.1 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. 11.14/1) for all seed rates above 30 kg/ha and an inner white scale (Fig. 11.14/2) for all seed rates below 30 kg/ha. The central, coloured scale (Fig. 11.14/3) shows the gearbox settings from 1 until 100.

Example:

Desired seed rate 125 kg/ha.

- For the first setting set the gearbox setting lever to "gearbox setting figure 70" (you may also choose other settings). A seed rate of 175 kg/ha is being calculated.
- Take the disc rule and align the seed rate 175 kg/ha (Fig. 11.14/A) and the "gearbox setting figure 70" (Fig. 11.14/B).
- Now read off the disc rule the gearbox setting for the required seed rate of 125 kg/ha (Fig. 11.14/C). In our example this is the "gearbox setting figure 50" (Fig. 11.14/D).
- Check the gearbox setting figure which you have determined by recalibrating the drill as in para. 11.0.

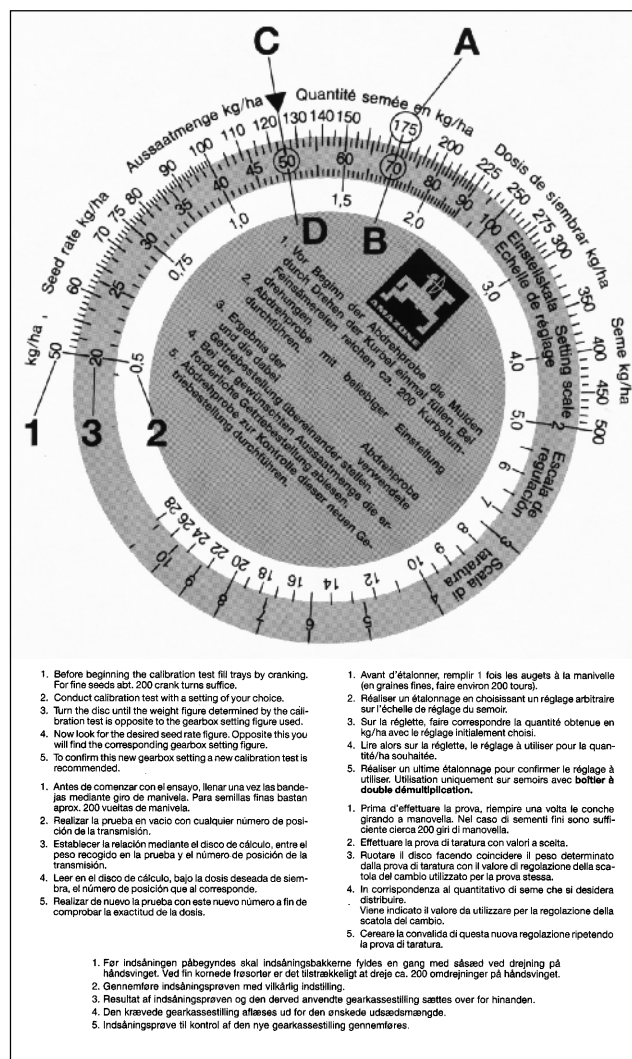


Fig. 11.14



11.2 Seed rate deviations between the setting and sowing para. 11.0.

To avoid deviations between the calibration of the seed rate and the drilling seed rate, please note the following hints:

For the first operation

of the seed drill the seed rate should be rechecked after approx. 1 ha according to para. 11.0. On new machines the surfaces of the seed housings are changed by seed dressing agent residues and this may affect the flowing property of the seed and therefore the seed rate.

When sowing dressed seeds

check the seed rate after two to three seed box fillings according to para. 11.0. Residues of seed dressing agents on bottom flaps and seed metering wheels may affect the flowing property of the seed and consequentially the seed rate. After two or three seed box fillings the dressing agent residues stick to the bottom flaps and seed metering wheels and a balance is achieved. Thereafter, the seed rate will not change any more.

When sowing moist dressed seed

the seed should "age" at least for one week (preferably two weeks) between seed dressing and sowing to avoid deviations between the calibration test and the drilled seed rate.

Incorrect setting of the bottom flaps

may cause uncontrolled flowing of seed (excessive seed rates) during the sowing operation. Therefore, the basic setting of the bottom flaps should be checked every six months and before any sowing season according to para. 26.4.

In case of wheel slip

the drive wheel for the metering units turns on very light and loose soils less than at a same distance on very firm cloddy soils. In such cases of high wheel slippage the number of crank turns for determining the gearbox setting should be checked in the following manner.

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

2,50 m working width	=	100,0 m	travelled distance
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 wheel rotations is then counted when travelling the measured distance. With this number of wheel rotations the seed drill wheel has to be cranked when determining the gearbox setting according to

12.0 Track markers

The seed drill is equipped with track markers (Fig. 12.1) for marking a trace in the soil in line with the tractor's centre.

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

After turning at the headlands the tractor follows the centrally marked trace when travelling the next bout.

When driving to and fro in the field both track markers are operated one after the other. One track marker (Fig. 12.2/1) is always hold closely to the side part of the seed drill.

The track markers are lifted by two hydraulic (Fig. 12.3/1).

The hydraulic rams are connected with the track marker shuttle valve (Fig. 12.4/1) (please also refer to para. 2.10).

Actuate the track marker shuttle valve only from the tractor cab by using a single acting control spool valve. When pressurising the track marker shuttle valve the operating track marker is raised, when in "float" position the second track marker is lowered.

If both track markers are lifted and the tractor control spool valve is actuated four times:

1. the first track marker is brought into operating field position
2. the first track marker is lifted
3. the second track marker is brought into the operating field position.
4. the second track marker is lifted.

Raise both track markers

- before turning at the headlands
- at obstacles in the field
- before transport.



Staying in the operating area of the track marker arm is prohibited!

Only actuate the control spool valves from the tractor cab!

When the control spool valves are actuated several hydraulic rams may simultaneously start to operate, depending on their switching position!

Ask people to leave the danger area!

Danger of injury from moving parts!



Fig. 12.1

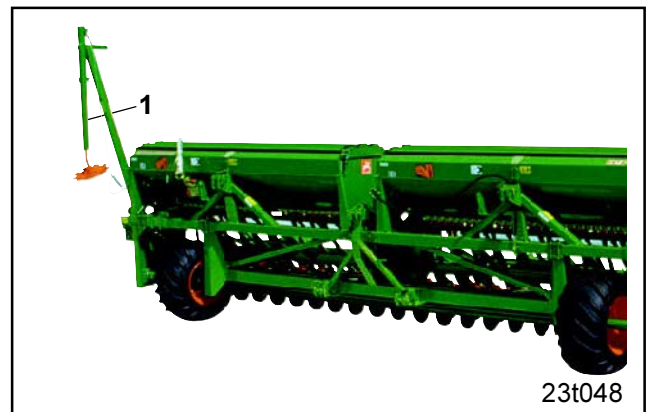


Fig. 12.2

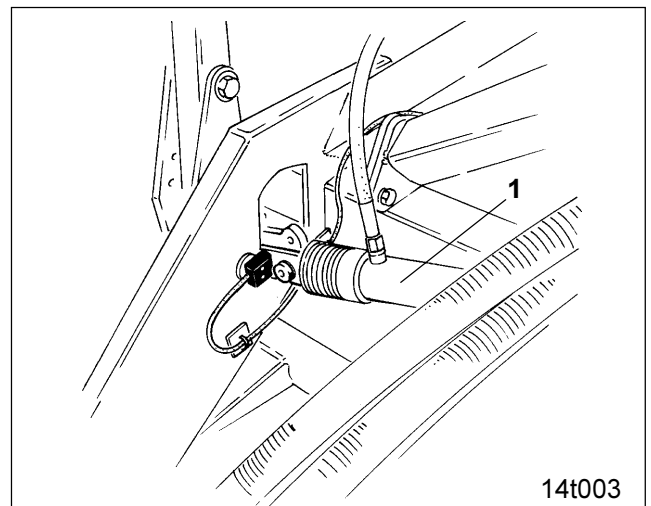


Fig. 12.3

12.1 Fitting the track marker arms

Fit the loosely supplied track marker arms as follows:

Affix the hydraulic ram (Fig. 12.5/1) on the bracket (Fig. 12.5/2) in the short slotted hole (Fig. 12.5/3). If necessary re-bolt the bracket (Fig. 12.5/2).

Bolt on the track marker arm (Fig. 12.5/4) by using:

- one hex. bolt M6 x 90, 8.8 DIN 931 (Fig. 12.5/5),
- two washers 6,4 x 18 x 1,6 DIN 9021 (Fig. 12.5/6) and
- one lock nut M6, 8 DIN 980V (Fig. 12.5/7).
- one hex bolt M14 x 100, 8.8 DIN 931 (Fig. 12.5/8),
- two tensioning washers 14 DIN 6796 (Fig. 12.5/9) and
- one lock nut M14, 8 DIN 980V (Fig. 12.5/10).

Affix track marker pendulum tube (Fig. 12.6/1) on the track marker arm and secure with washer 36 x 50 x 2 (Fig. 12.6/2) and expansion pin 10 x 50 DIN 1481 (Fig. 12.6/3).

Affix wire cable (Fig. 12.6/4) by using a tensioning spring.

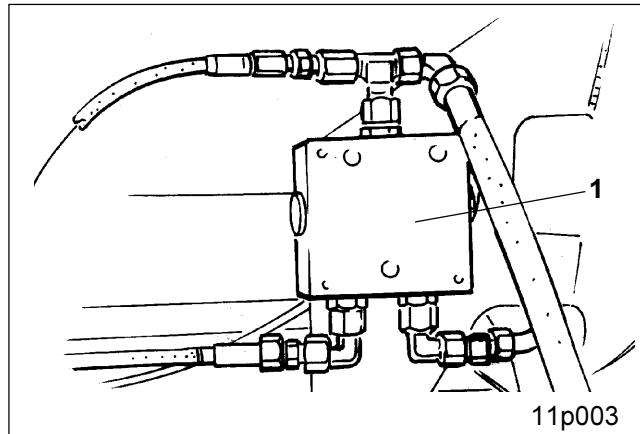


Fig. 12.4

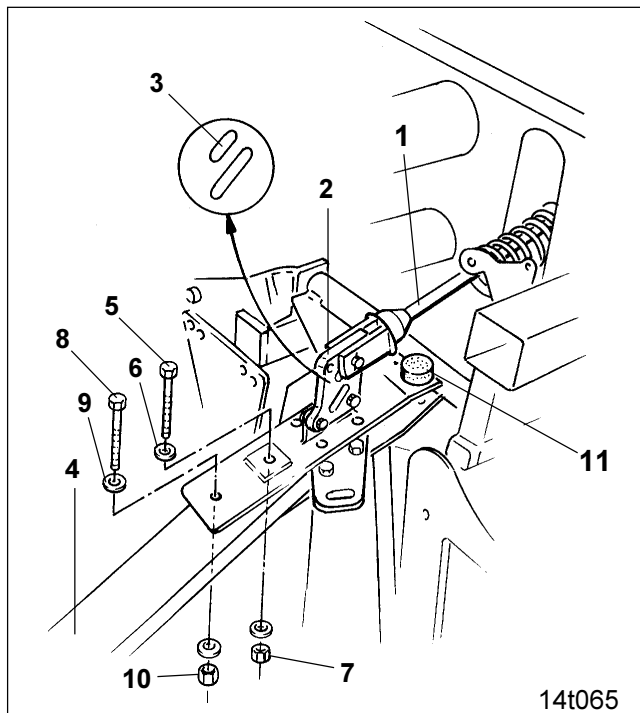


Fig. 12.5

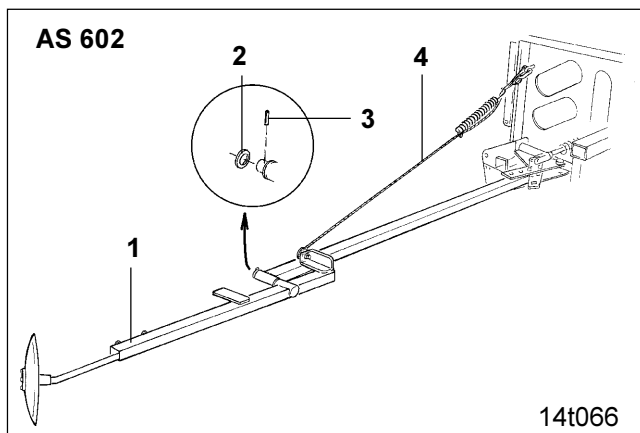


Fig. 12.6

Lock the track marker discs by using two hex bolts (Fig. 12.7/1).

12.2 Bring markers into operating position

Only immediately prior to the operation in the field

- hold track marker arm (Fig. 12.8/1) and remove clip pin (Fig. 12.8/2) (required for transport)
- When not needed, insert the clip pin (Fig. 12.8/2) into the bracket (Fig. 12.8/3) into the bracket (Fig. 12.8/3)



After removal of the clip pin (Fig. 12.10 bzw. Fig. 12.8) the marker arm is moved out slightly to the side.



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.

12.3 Bring markers into transport position

Before transport the marker arms must be fixed to the seed drill in reverse order as described in para. 12.2, and secured with clip pins.



Danger of injury!
Before travelling on not public and public roads the track markers must be secured by using clip pins against unintended lowering.

This also applies when changing from one field to the other.



The buffer blocks (Fig. 12.5/11) may never be removed and when worn must be replaced!

The buffer blocks prevent the operator from forgetting to lock the markers with clip pins into the transport position.

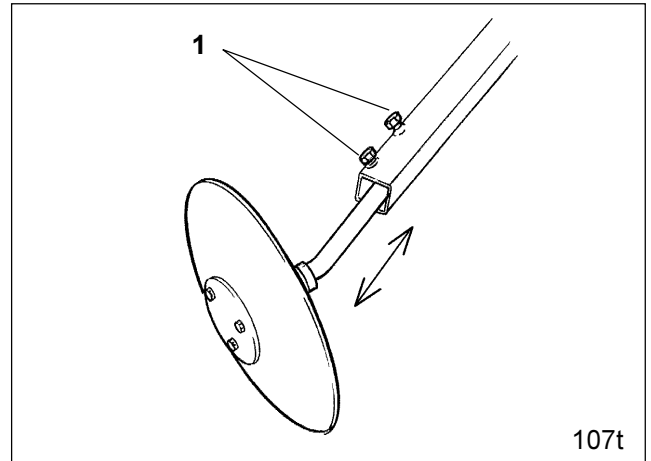


Fig. 12.7

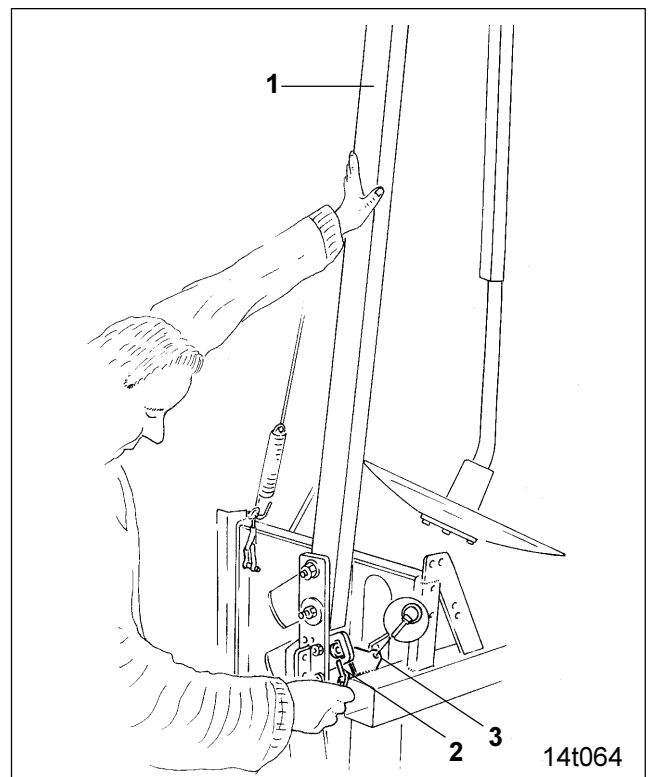


Fig. 12.8

12.4 Setting the markers 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.

Take the spacing "A" (Fig. 12.9) from track marker disc to machine's centre from the table (Fig. 12.10).

Prior to adjusting the marker discs (Fig. 12.11) in the track marker arms slacken the two hex. bolts (Fig. 12.11/1) and 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".

Affix the wire cable (Fig. 12.12/1) on the marker arm in such a way that the marker disc is set to a working depth of 60 to 80 mm.

In case due to the tensile force of the tensioning spring (Fig. 12.12/2) the marker trace in the soil is too deep, the tensioning spring must be released.

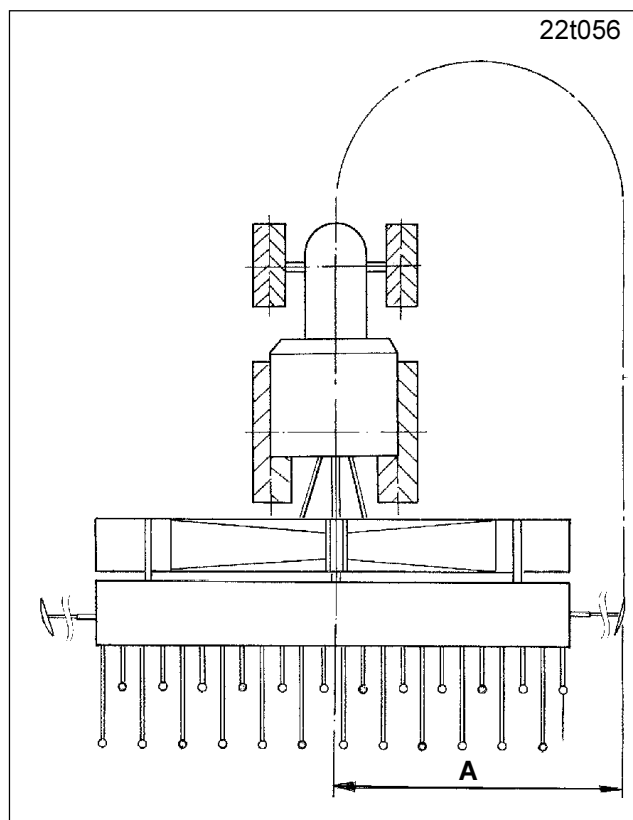


Fig. 12.9

working width	Spacing A
2,50 m	250,0 cm
3,0 m	300,0 cm
4,0 m	400,0 cm
4,50 m	450,0 cm
6,0 m	600,0 cm

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Fig. 12.10

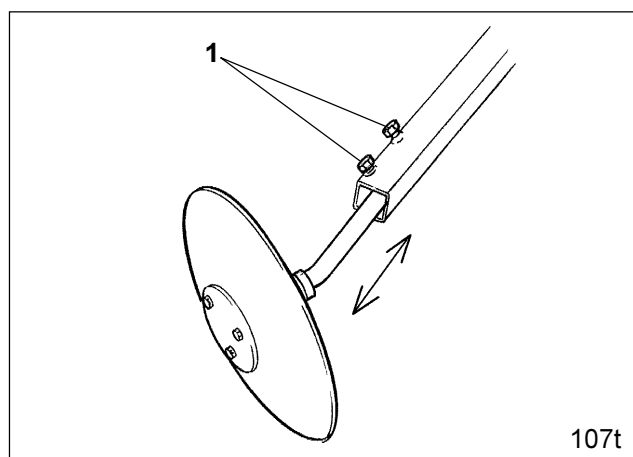


Fig. 12.11

12.5 Shear bolt safety

In order to avoid damage lift the track markers in front of an obstacle in the field.

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. shear bolt M6 x 90, 8.8 DIN 931 (Fig. 12.13/1) will shear off.

Affix the track marker arm as illustrated in figures (Fig. 12.5 and Fig. 12.6).

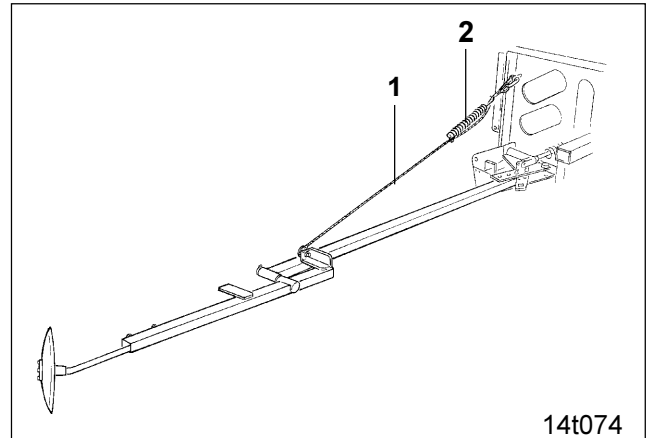


Fig. 12.12

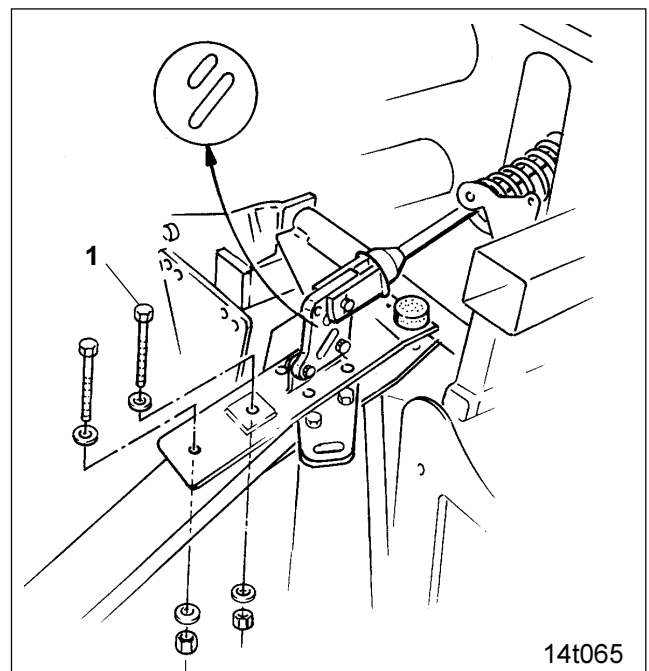


Fig. 12.13

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:

Travel with the seed drill on 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 by a hydraulic ram (Fig. 13.6, special 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, and the position read off an indicator scale (Fig. 13.2/1) which is visible from the tractor cab.

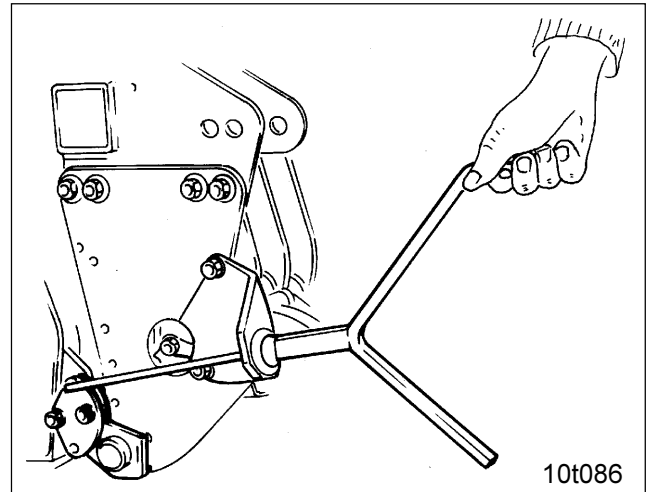


Fig. 13.1

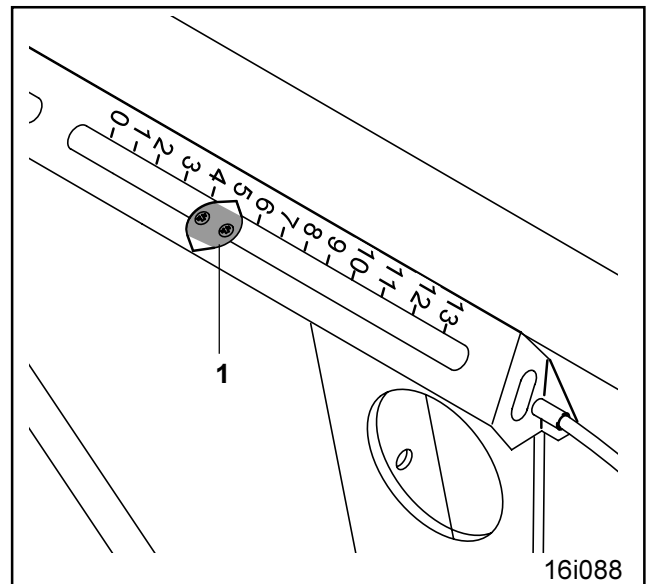


Fig. 13.2

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. 13.4/1) clockwise, by turning it counter clockwise it is reduced.

On drills that are fitted with RoTeC-disc coulters, the coulters are equipped with **depth limiters** (special option) and if the desired placement depth cannot be achieved by turning the adjustment spindle (Fig. 13.4/1), then all RoTeC disc coulter depth limiters can be readjusted according to para. 13.3.1.

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



The placement depth of the seed should be checked after every setting according to para. 13.0!

For actuating the adjustment spindle (Fig. 13.4/1) the crank (Fig. 13.4/2) has to be plugged onto the adjustment spindle.

The crank (Fig. 13.5/1) is placed in a retainer on the left hand frame part.

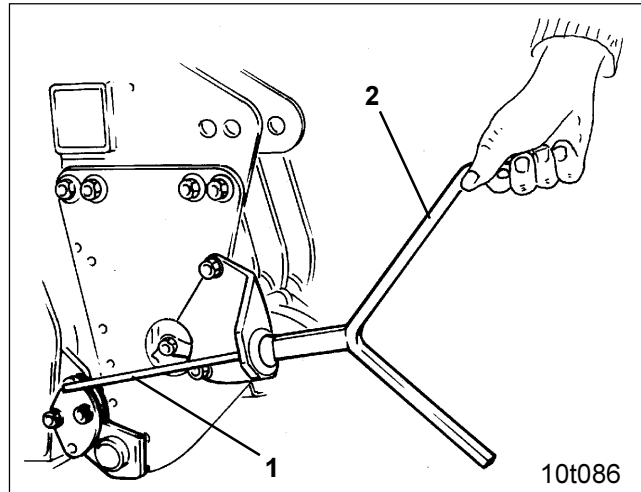


Fig. 13.4

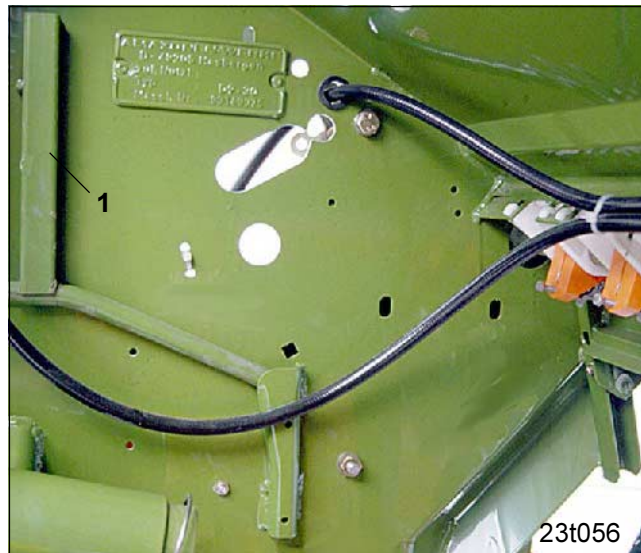


Fig. 13.5

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

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 valve (please refer to para. 3.6.4) 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 (if existing). If the coulter pressure is increased, the extra coverage following harrow pressure will be increased automatically.



When actuating the control spool valve the hydraulic rams of the coulter pressure adjustment and the extra coverage 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 (Fig. 13.7/3). Conversely, when pressure is applied to the ram it will stop at the position of the second top 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 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.

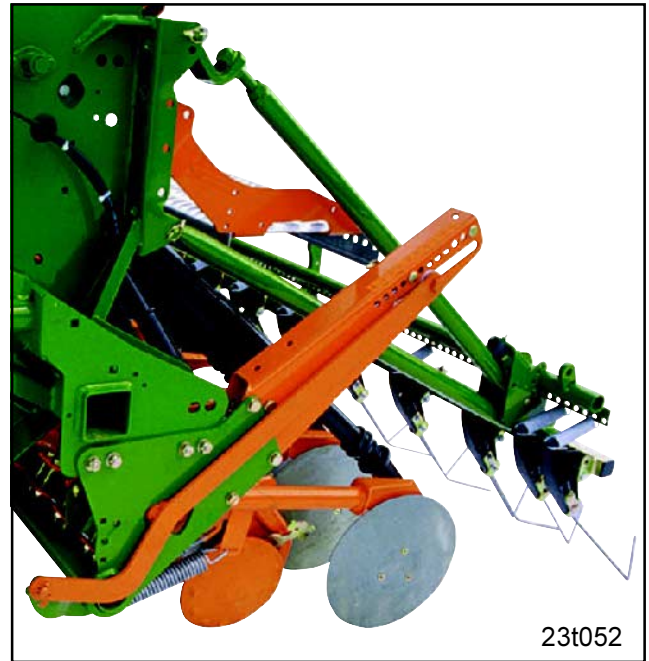


Fig. 13.6

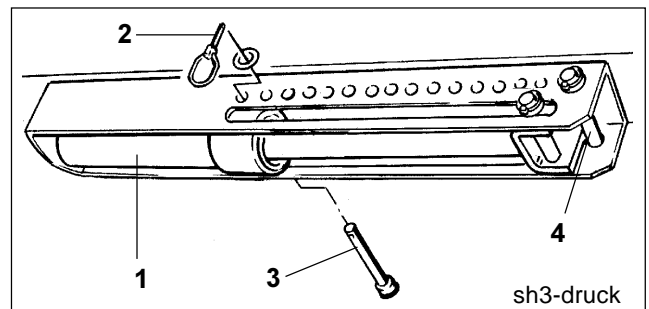


Fig. 13.7

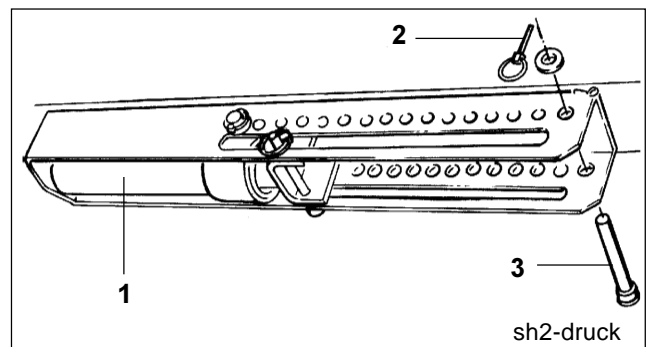


Fig. 13.8

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 the adjustment spindle.

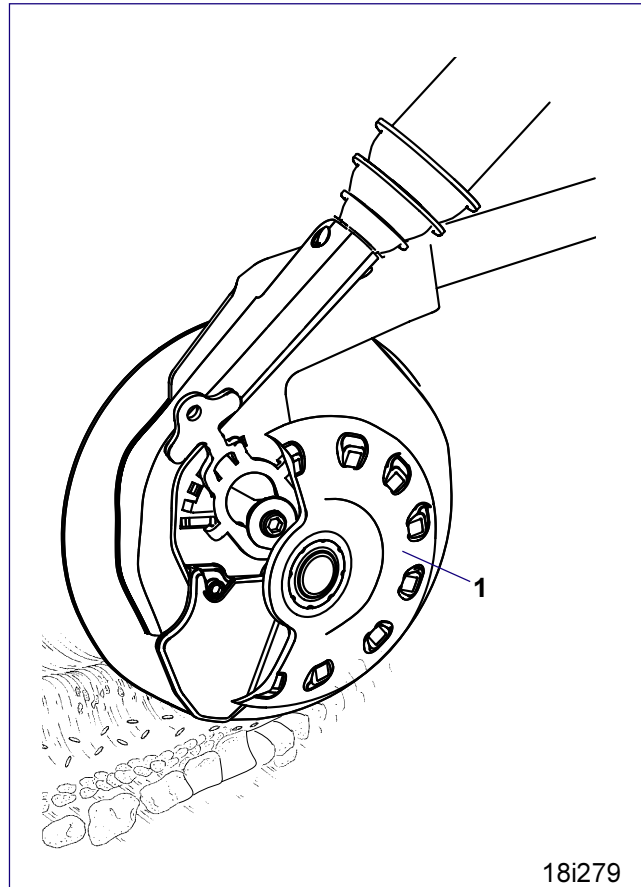


Check the seed placement depth always before starting the operation:
Travel with the seed drill on the field approx. 30 m at operational speed, check the placement depth of the seed and readjust if necessary.

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 (please refer to para. 13.3.1) for a placement depth of approx. 2 cm for medium heavy soils. For slightly increasing the placement depth the coulters pressure may be increased with the aid of the coulters 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.



18i279

Fig. 13.9

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. 13.1) over the locking pawl (Fig. 13.11/4)



Fig. 13.10

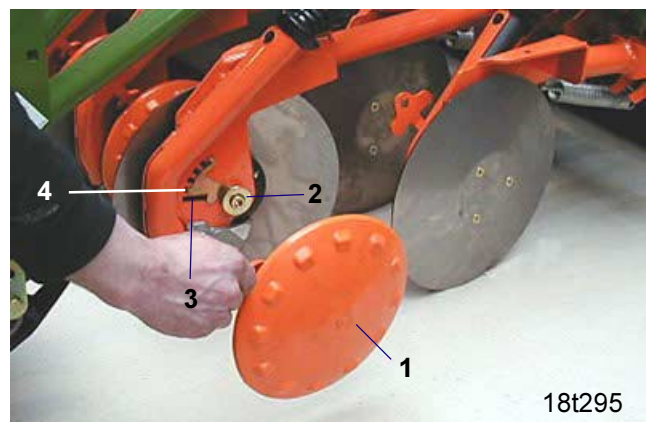


Fig. 13.11



Fig. 13.12

Setting the depth limiters

The RoTeC-depth limiting disc (Fig. 13.13/1) can be set in 4 positions. For medium soils the following placement depths (see Fig. 13.14) result:

Positionen 1:	placement depth approx. 2cm
Positionen 2:	placement depth approx. 3cm
Positionen 3:	placement depth approx. 4cm

without
depth limiting disc: placement depth > 4cm

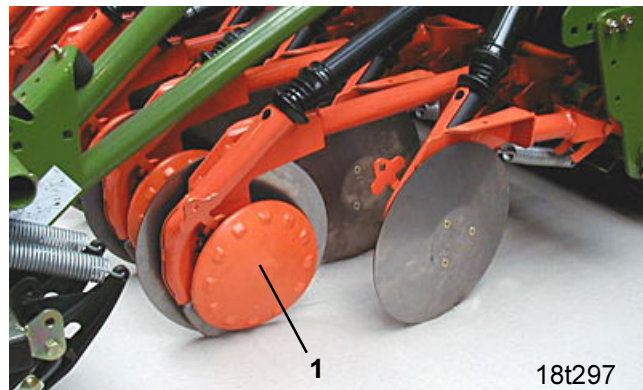


Fig. 13.13



Check the placement depth of the seed after every setting as described in para. 13.0!

Slight changes in the placement depth of the seed may then be set with the aid of the coulter pressure adjustment according to para. 13.1 or para. 13.2!

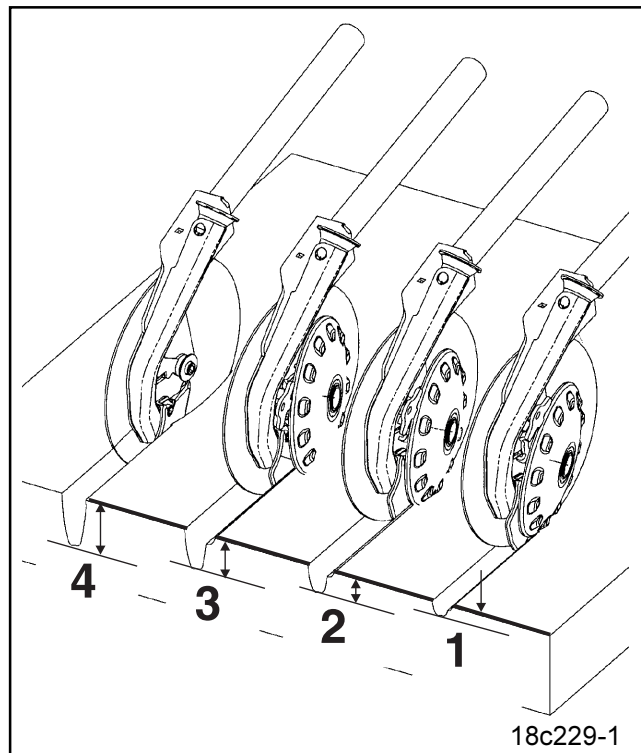


Fig. 13.14

14.0 Extra coverage following harrow (special 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 rubber buffer (Fig. 14.2/1).
- Locate fixing tubes (Fig. 14.2/2) with pins (Fig. 14.2/3) on the fixing brackets (Fig. 14.2/4) of the extra coverage following harrow and secure by using clip pins (Fig. 14.2/5).
- Locate fixing tubes (Fig. 14.2/2) with pins (Fig. 14.2/6) on the fixing brackets (Fig. 14.2/7) and secure by using clip pins (Fig. 14.2/8).

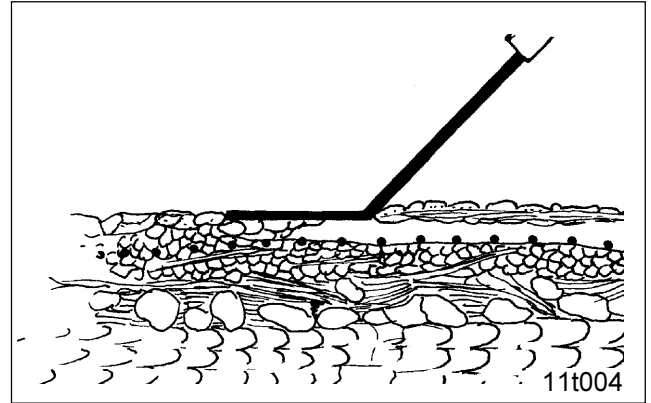


Fig. 14.1

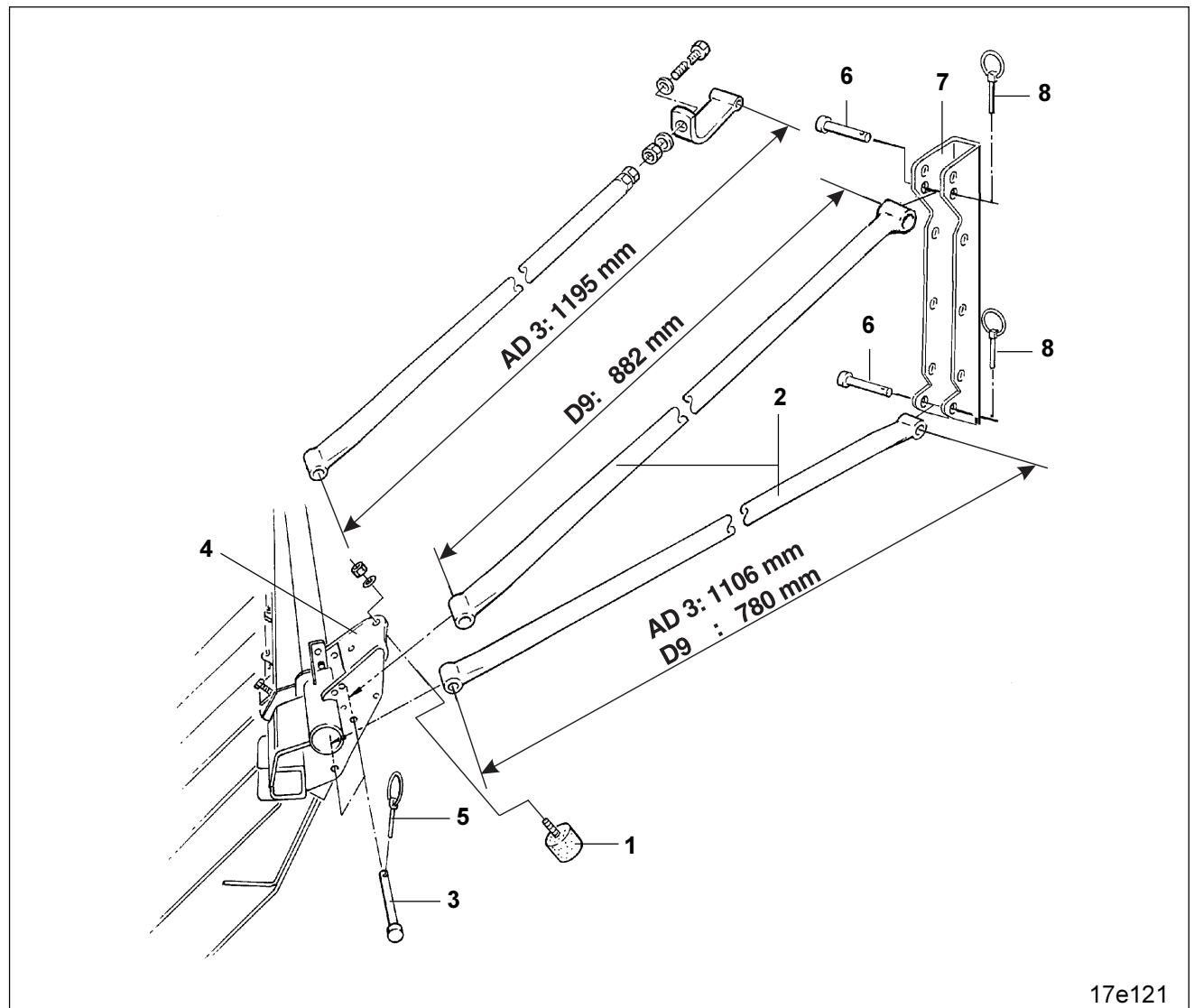


Fig. 14.2

14.1.1 Connecting hydraulic ram (special option)

When supplied the hydraulic ram (Fig. 14.3/1) is fitted to the extra coverage following harrow. Connect the hydraulic hose (Fig. 14.3/2) with the hydraulic ram (Fig. 14.3/1) and to the "cross piece connecting unit II" (Fig. 14.4/1), with which your seed drill has also been equipped.



Allow the hydraulic hose (Fig. 14.3/2) 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. 14.5/1) of the "connecting unit II" (Fig. 14.4/1) to a single acting control valve and actuate this spool control spool valve from the tractor's cab.



The hydraulic pressure adjustment of the extra coverage following harrow is coupled with the hydraulic coulter pressure adjustment and the hydraulic seed rate remote control (if fitted) and connected to the "cross piece connecting unit II" (Fig. 14.4/1). If the coulter pressure is increased, simultaneously the seed rate and the pressure on the extra coverage harrow tines will also be increased.



When actuating the control spool valve in the tractor cab, simultaneously the hydraulic rams of the coulter pressure adjustment, the pressure adjustment of the extra coverage following harrow and the seed rate remote control are pressurised!

**Ask people to leave the area of danger!
Danger of injury from moving parts!**

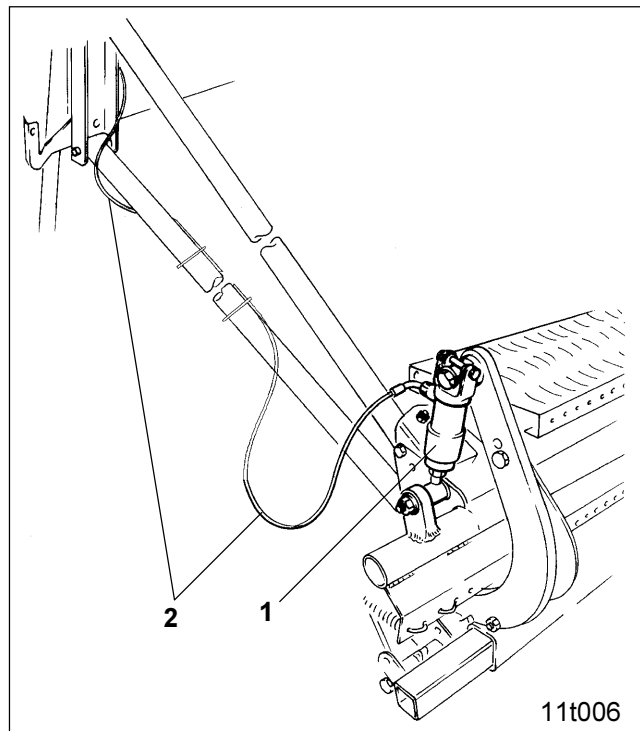


Fig. 14.3

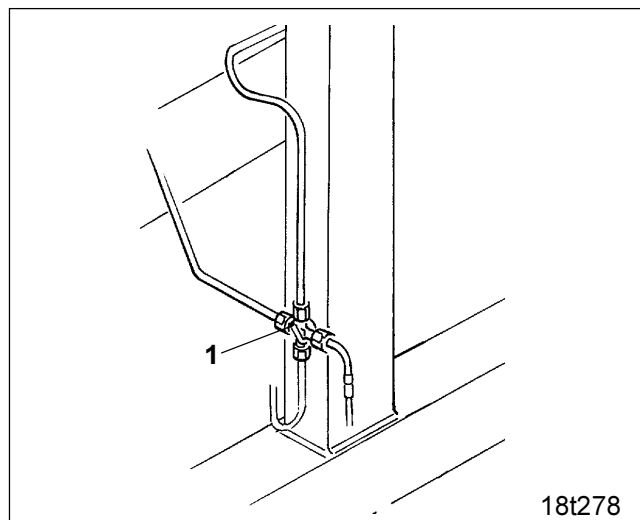


Fig. 14.4

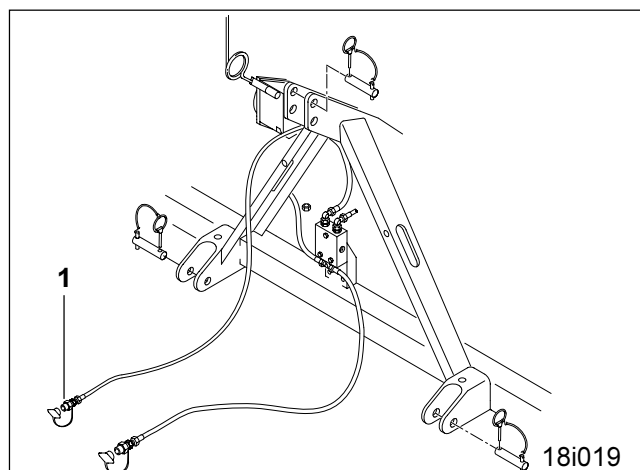


Fig. 14.5

14.2 Bring outer 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.

The outer following harrow tines (Fig. 14.6/1) have to be set 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. 14.6/2) with the outer harrow tines attached to it have to be moved outwards.

The square tubes with the outer harrow tines have to be locked into position after every alteration by clamping bolts (Fig. 14.6/3).



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 Position of harrow tines

The spring tines (Fig. 14.7) of the extra coverage following harrow have to be set in the field in such a way that they rest almost horizontally on the soil but still can move downwards by about 5 to 8 cm. The spacing between the soil and the square tube should then measure between 230 mm and 280 mm.

This setting is conducted by lengthening or shortening the top link arms (Fig. 14.8/1), with which your seed drill is attached to the soil tillage implement of the tractor.

A slight tilting of your seed drill to the front or to the rear does not affect the seed rate.

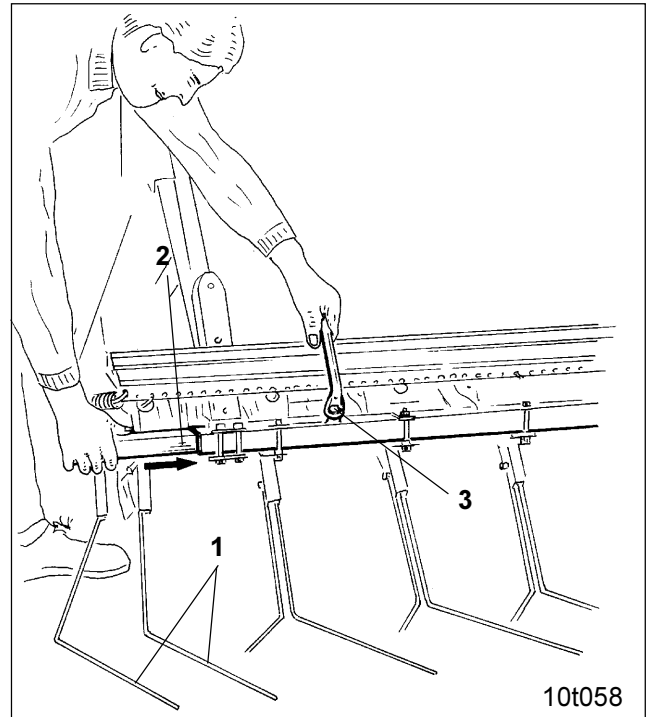


Fig. 14.6

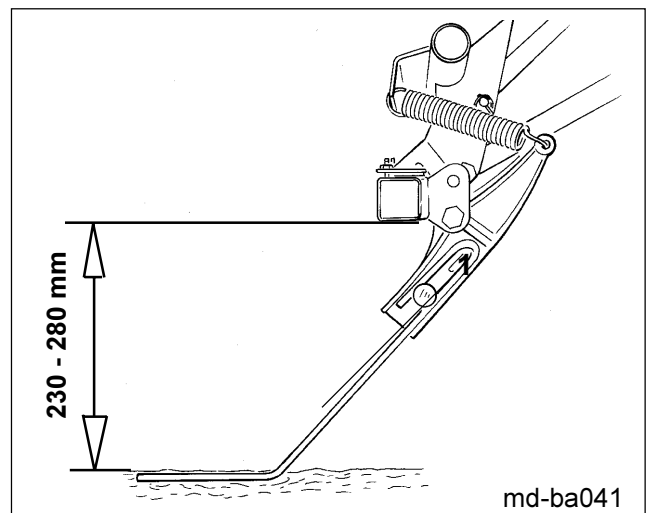


Fig. 14.7



Fig. 14.8

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

The pressure at which the spring tines (Fig. 14.9/1) 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. 14.9/2) upwards. Insert the pin (Fig. 14.9/3) into a hole below the stop lever (Fig. 14.9/2) and secure by using a clip pin (Fig. 14.9/4). 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. 14.9/2) is actuated with the coulter pressure adjustment crank (Fig. 14.9/5).

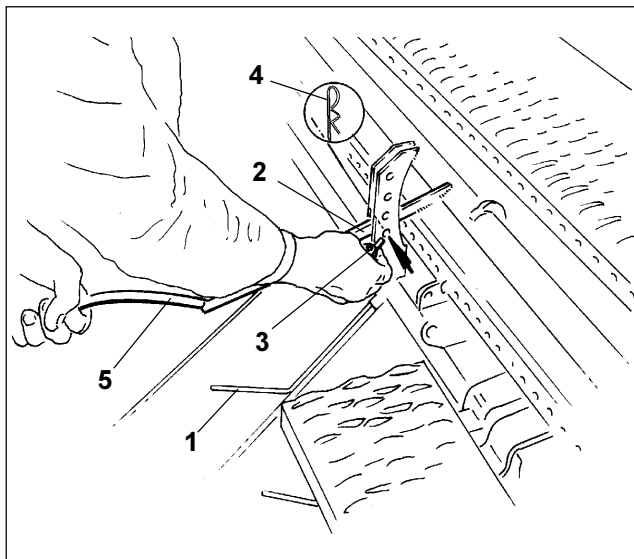


Fig. 14.9



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.

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

The pressure by which the spring tines (Fig. 14.9/1) of the extra coverage following harrow are pressing on to the soil should be set 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 harrow pressure adjustment.

When changing from normal soil to heavy soil or vice versa, the coulter pressure is readjusted by a hydraulic ram (Fig. 14.10/1).

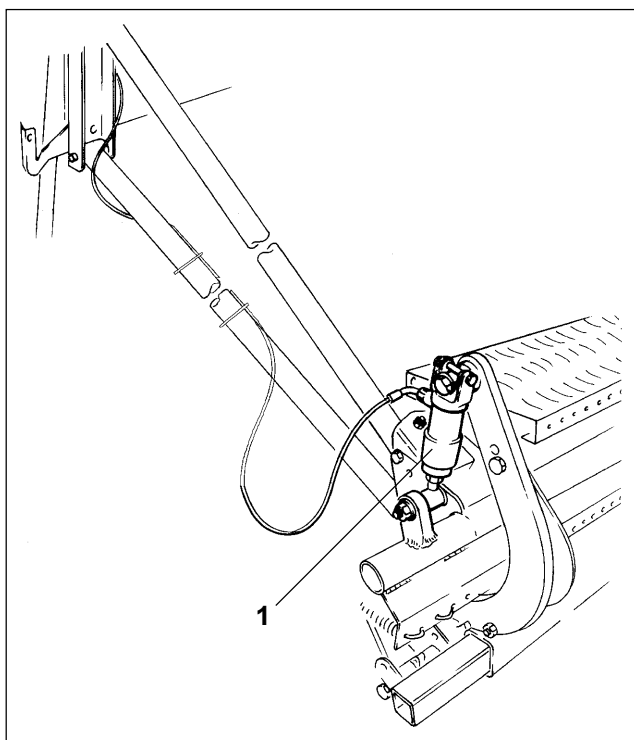


Fig. 14.10

Two pins (Fig. 14.11/1 and Fig. 14.11/2) are placed as a stop for the lever (Fig. 14.11/3) in the setting segment. The lever (Fig. 14.11/3) which is actuated by the hydraulic ram (Fig. 14.10/1) rests on the pin I (Fig. 14.11/1) when the hydraulic ram is without pressure and it stops on pin II (Fig. 14.11/2) when the hydraulic ram has been pressurised.

For setting the normal harrow pressure

- Pressurise hydraulic ram (Fig. 14.10/1).
- Insert pin I (Fig. 14.11/1) into a hole in the setting segment below the lever (Fig. 14.11/3) and secure by using a clip pin (Fig. 14.11/4).

For setting the increased harrow pressure

- Relieve the hydraulic ram (Fig. 14.10/1) from pressure.
- Insert pin II (Fig. 14.11/2) into a hole **above** the lever (Fig. 14.11/3) in the setting segment and secure by using a clip pin (Fig. 14.11/4).

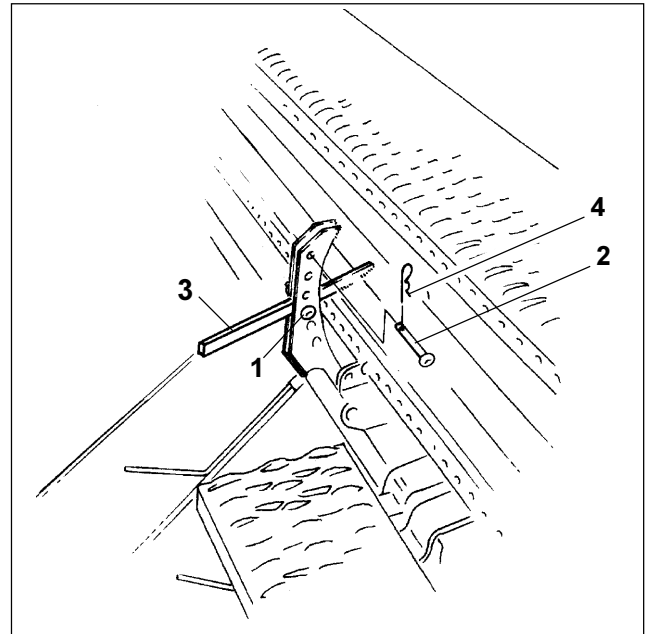


Fig. 14.11



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 at 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.

14.6 Road transport

For transport on public roads, the outer square tubes (Fig. 14.12/1) carrying the outer harrow tines (Fig. 14.12/2) should be slid back into the centre carrier tube. Before you can do this, slacken clamping bolt (Fig. 14.12/3) and retighten firmly afterwards.

In the field bring the outer harrow tines (Fig. 14.12/2) into operating position according to para. 14.2.



Before transport on public roads slide in the outer square tubes (Fig. 14.12/1) all the way to the stop and secure with clamping bolts.

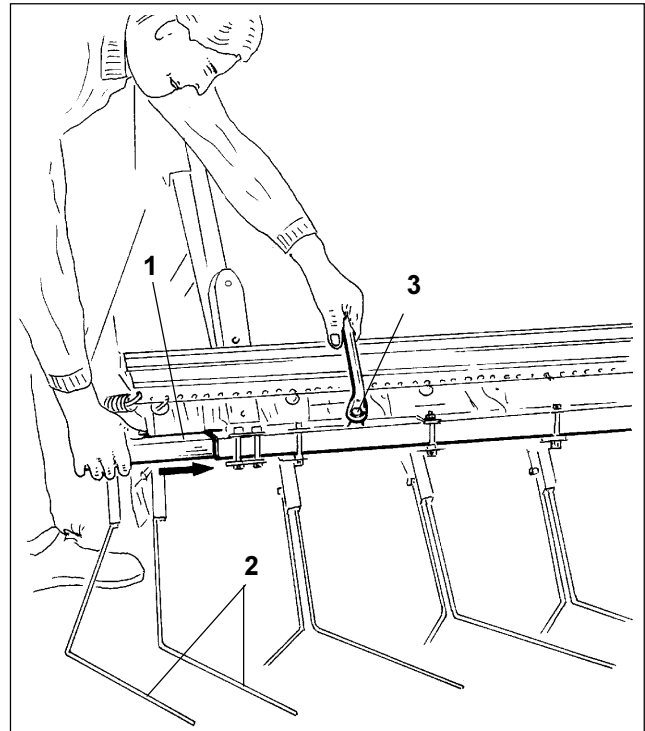


Fig. 14.12

15.0 Loading board (Special option)

For easier filling of the seed box from the rear of the seed drill the loading board can be fitted if your seed drill is equipped with the extra coverage following harrow.



**The loading board may only be used for filling seed drill!
Never allow any person to stay on it during travelling and while in operation!**



15.1 Fitting the loading board

Attach the loading board (Fig. 15.2/4) to the seed drill, and the steps (Fig. 15.2/15) to the extra coverage following harrows main tube.

 **Fitting the stair steps (Fig. 15.2/15) with 2 steps to seed drills D9 with 3 steps to seed drills AD 3!**

Fit the steps (Fig. 15.2/15) at random on the right hand or left hand side of the railing (Fig. 15.2/5).

The fitting of the loading board should be carried out according to Fig. 15.2. Please take the individual parts needed for fitting from the table (Fig. 15.1). The numbers shown in this table refer to a seed drill with 3 m working width.

 **Do not fit extension (Fig. 15.2/18) to seed drill of the type D9!**

Assembly parts for seed drills with 3 m working width		
No.	Description	Number
2	Carrier for loading board l.h.	1
3	Carrier for loading board r.h.	1
4	Securing slotted plate 2x75x360x2520	1
5	Railing for step	1
6	Bracing	1
7	Hex. bolt 933 12x 30 8.8 A2g	8
8	Hex. bolt 933 12x 25 8.8 A2g	1
9	Hex. bolt 933 8x 25 8.8 A2g	3
10	Securing nut 6927 M12 10 A2g	9
11	Securing nut 6927 M8 8 A2g	7
12	Olive No.32	4
13	Sunk bolt 7991 8x40 8.8 A2g	4
14	Washer 9021 8,5x 25x 2 St	4
15	Step	1
16	Wedge bolt10x83/33 8.8 A2g	2
17	Hex. nut 934 M10 8 A2g	2
18	Extension	2

Fig. 15.1 t162gb10

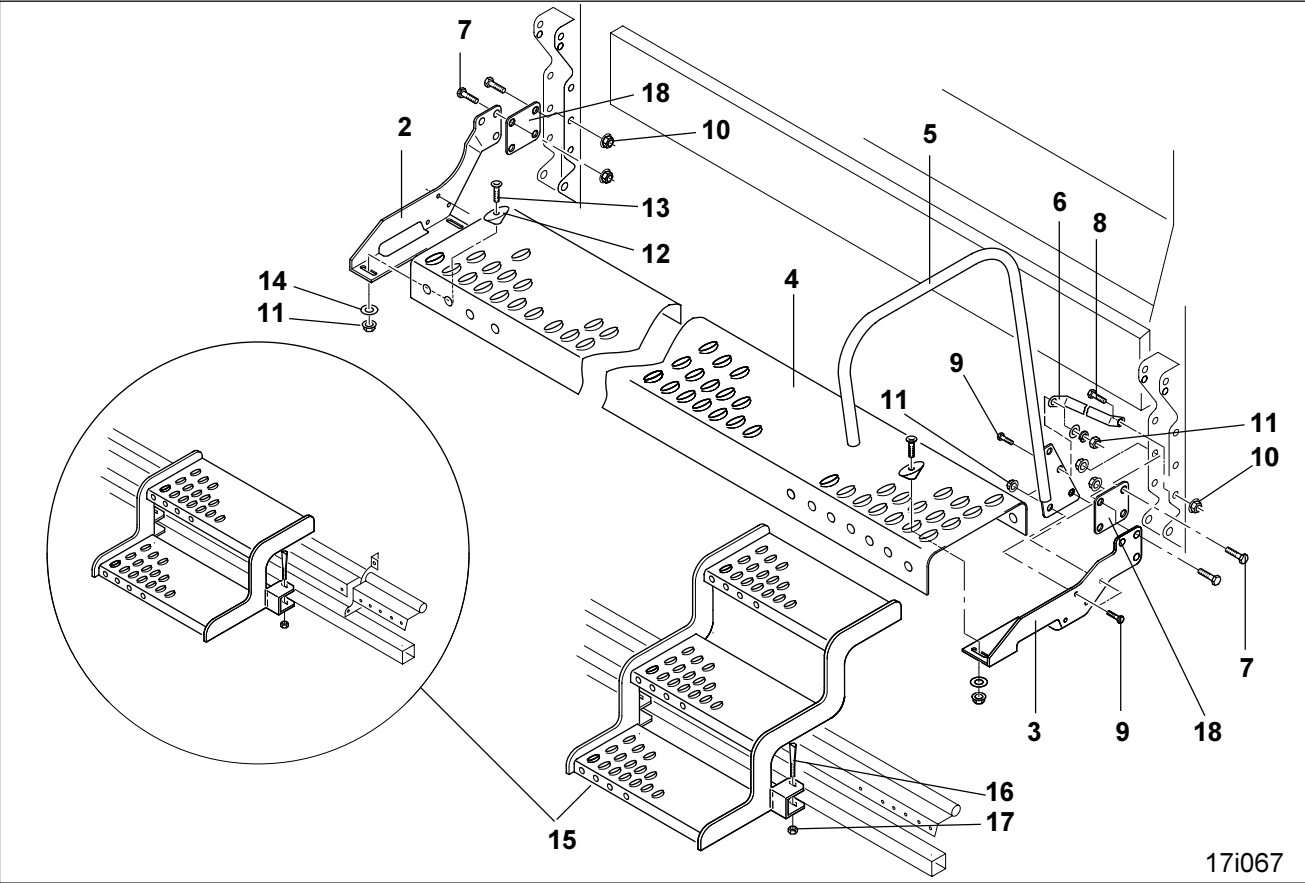


Fig. 15.2

18.0 Tramlining control, hydraulically actuated (special option)

With the aid of the tramlining control tramlines are created in the field so that other implements, e. g. fertiliser broadcaster or field sprayer may travel accurately

Tramlines are marks (Fig. 18.1/1), in which no seed is sown. The spacing between the tracks corresponds to the track width between the wheels of the husbandry tractor. For creating marks, the seed supply is interrupted by switching off some seed metering wheels. The spacing between sets of tramlines corresponds to the working widths of a field sprayer (Fig. 18.1/2) or a fertiliser broadcaster for example.

The rhythm for creating tramlines is controlled by the switch box (Fig. 18.2/1). The figure (Fig. 18.2/2) in the switch box indicates to the tractor operator the bout position of the switch box. When the switch box shows "3" the switch box shows after starting the operation the figures 2, 0, 1, 2, 0, 1, etc. (see Fig. 18.1). When the switch box shows the figure "0" the seed drill is creating tramlines.

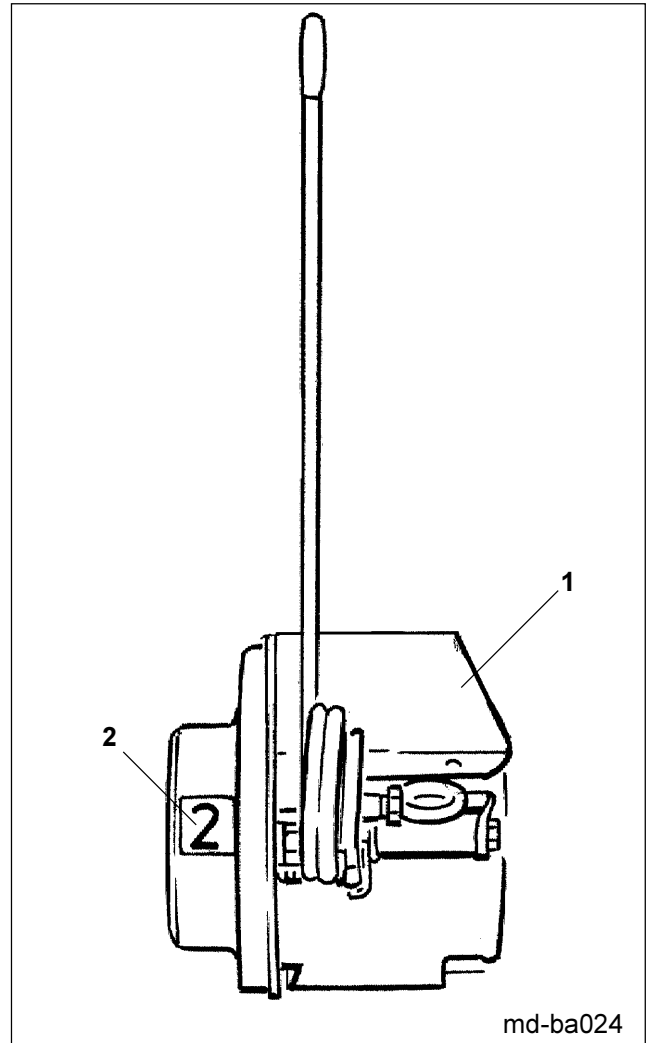


Fig. 18.2

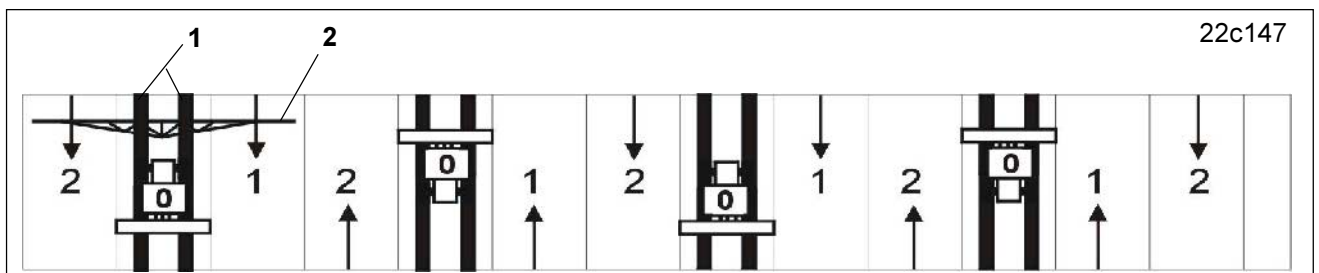


Fig. 18.1

Switching rhythm	Working width of the machine				
	2,5 m	3,0 m	4,0 m	4,5 m	6,0 m
	Tramline spacings				
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. 18.3

t691gb01

The spacing between sets of the tramlines depends on the switching rhythm created by the switch boxes internal sprocket, and is also related to the working width of the seed drill (see. Fig. 18.3).

The hydraulic ram (Fig. 18.4/1) inside the switch box is operated by single acting control spool valve in the tractor cab. If the control spool valve is actuated at field's end, the switch box sprocket is tripped on to the next figure (Fig. 18.5/1) the number of which appears in the window.

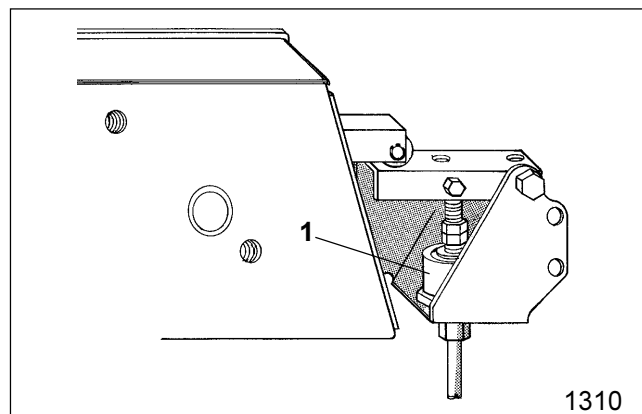


Fig. 18.4



The hydraulically actuated markers, the hydraulically actuated switch box for the tramline control and the hydraulically actuated tramline marker control (if fitted) are all coupled together.

If the control spool valve is actuated when turning on the headlands, then the markers are switched over and the switch box trips over onto the next figure.

When the switch box shows the figure "0", the tramline seed metering wheels stop and the pre-emergence marker discs (if fitted) are lowered.

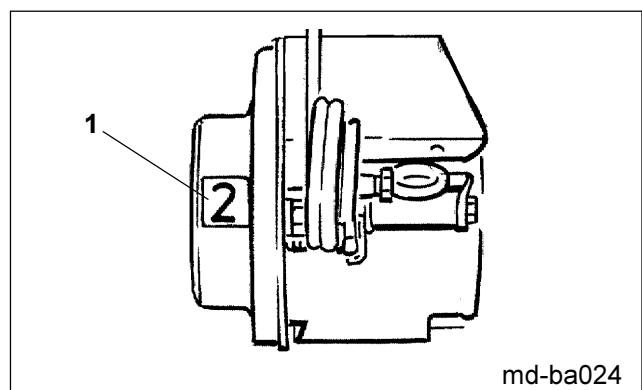


Fig. 18.5



When actuating the control spool valve, the hydraulic rams of the hydraulically actuated track markers and the hydraulically actuated switch box are applied with pressure simultaneously. At

**the same time the marker discs of the pre-emergence markers (if fitted) may move!
Ask people to leave the area of danger!
Danger of injury from moving parts!**

18.1 Fitting

On delivery of your seed drill the tramline metering wheels are set to the wheel mark of your tractor and the switch box is equipped with the switching rhythm as ordered by you. The hydraulic hose (Fig. 18.6/1) to which – among others – also the hydraulic ram inside the switch box is connected, has to be connected with a single acting control spool valve on the tractor.

18.2 Settings prior to the begin of operation

Prior to starting the operation the switch box should be set to the correct figure (Fig. 18.8/1). On the following page you will find examples for creating tramlines. The columns "A" to "D" include:

- A = Working width of the seed drill
- B = Tramline spacing
- C = Switching position of the switch box
- D = Switching position of the switch box in the field

Move to column "C" of the control of your switch box and set the first figure in column "D" below "START" in the viewing window of the switch box. Pull the control lever (Fig. 18.8/2) until the correct figure appears in the window. You may actuate the control lever from the tractor cab when you guide the rope fixed to the control lever into the tractor cab

Example:

Fig. 18.7 illustrates creating tramlines with "switching rhythm 3". In column "C" move on figure "3" (switching 3). Now change to column "D". The operation in the field starts with the first figure below the letters "START" in column "D". In our example (switching rhythm 3) the operation starts with figure "2". Now set the determined figure before starting the operation in the window of the switch box.

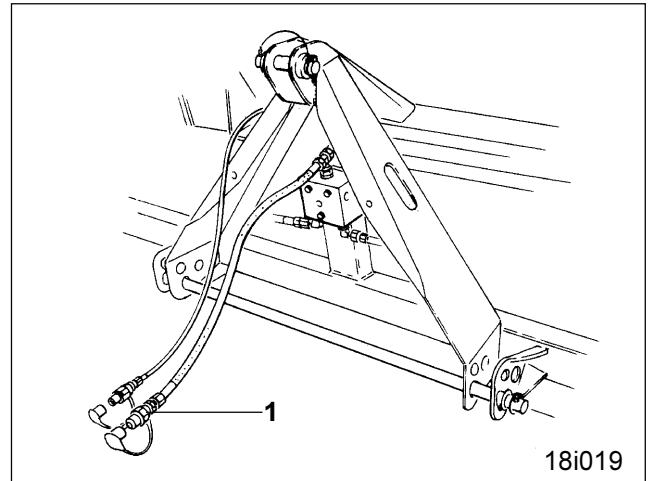


Fig. 18.6

A		B	C	D										22c271	
				START DÉPART											
3,0 m	9 m			2	1	2	1	2	1	2	1	2	1		
4,0 m	12 m														
6,0 m	18 m		3												

Fig. 18.7



The hydraulically actuated track markers are coupled with the hydraulically actuated switch box for the tramline control. Ensure that the wanted marker disc is lowered when you have set the switch box to the correct figure. If necessary actuate the tractor control valve once more.

18.3 Switching off tramlining control

The hydraulically actuated markers are coupled with the hydraulically actuated switch box for the tramlining control. Therefore, in cases where no tramlines are required, the markers will still be operating. To prevent the bout being switched each time you operate the markers, proceed as follows:

- Relieve the hydraulic system from pressure
- Push the clamping bolt (Fig. 18.8/3) in the slotted hole downwards until the switching on the control lever (Fig. 18.8/2) is not possible any longer. After setting firmly retighten the previously slackened clamping bolt (Fig. 18.8/3).



When the tramlining control has been switched off, figure (Fig. 18.8/1) in the switch box must not be "0" as otherwise tramlines are created continuously.

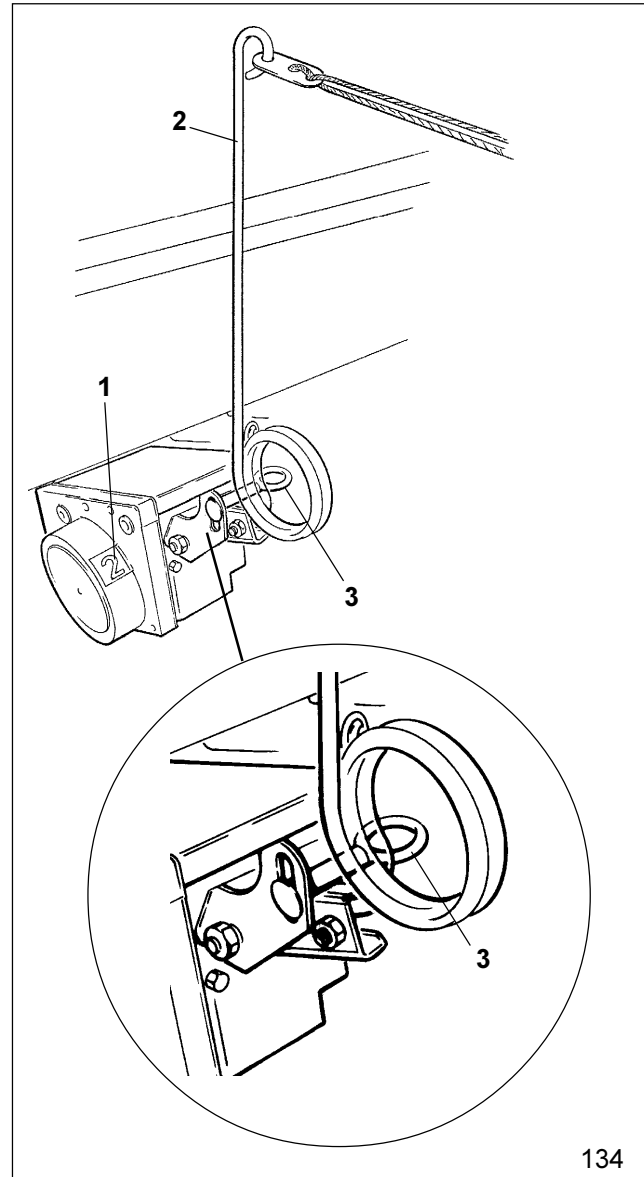


Fig. 18.8

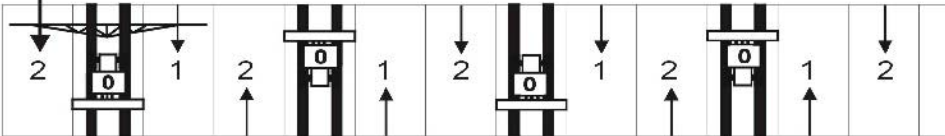
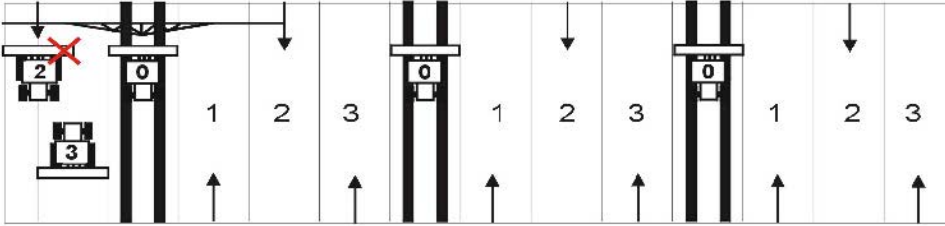
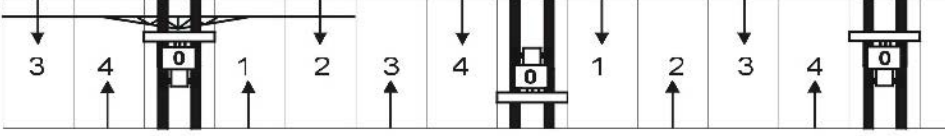
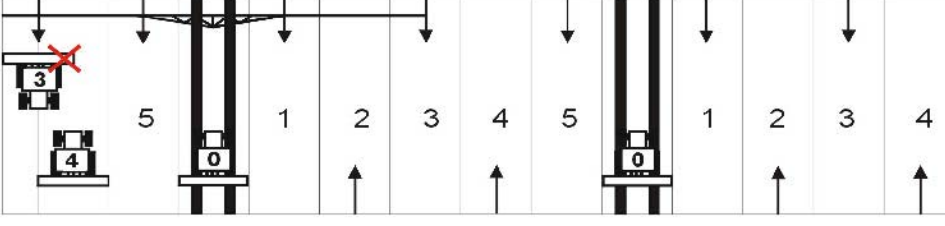
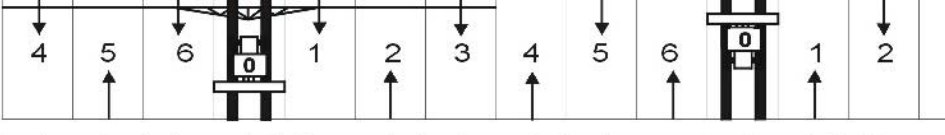
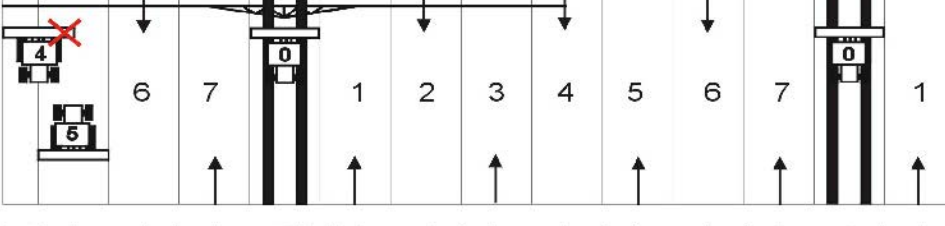
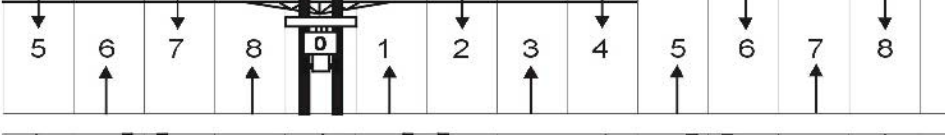
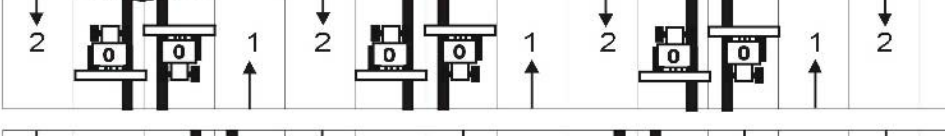
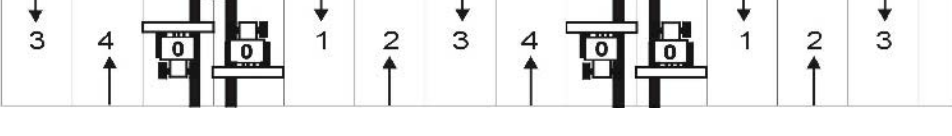
A	B	C	D
START DÉPART			
3,0 m 4,0 m 6,0 m	9 m 12 m 18 m	3	
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m	10 m 12 m 16 m 18 m 24 m	4	
3,0 m 4,0 m 6,0 m	15 m 20 m 30 m	5	
2,5 m 3,0 m 4,0 m 4,5 m	15 m 18 m 24 m 27 m	6	
3,0 m 4,0 m	21 m 28 m	7	
2,5 m 3,0 m 4,0 m	20 m 24 m 32 m	8	
3,0 m	27 m	9	
2,5 m 3,0 m 4,0 m 4,5 m	10 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. 18.9

18.4 Hints for creating tramlines with 4-, 6- and 8-bout switching rhythms

When creating tramlines with 4-, 6- and 8-bout switching rhythms, there are two possibilities to start the operation. The first possibility to create tramlines is illustrated in Fig. 18.9. You will find both possibilities in the example of a 4-bout switching rhythm illustrated in Fig. 18.10:

1. During the seed drill's first run in the field, the shutter slides are shut on half the drill.
This allows the fertiliser broadcaster or the field sprayer to operate at its full working width.
2. The second possibility is to start the first run in the field creating a tramline. Prior to the first run in the field set the switch box on figure "0".
The seed drill always operates with the full working width.
During the first run in the field fertiliser broadcasters spread to one side with boundary spread disc or border spreading devices.
During the first run in the field, one boom of the field sprayer will be switched off.



Please do not forget after the seed drill's first run in the field to reset the fertiliser broadcaster or field sprayer to their full working width.

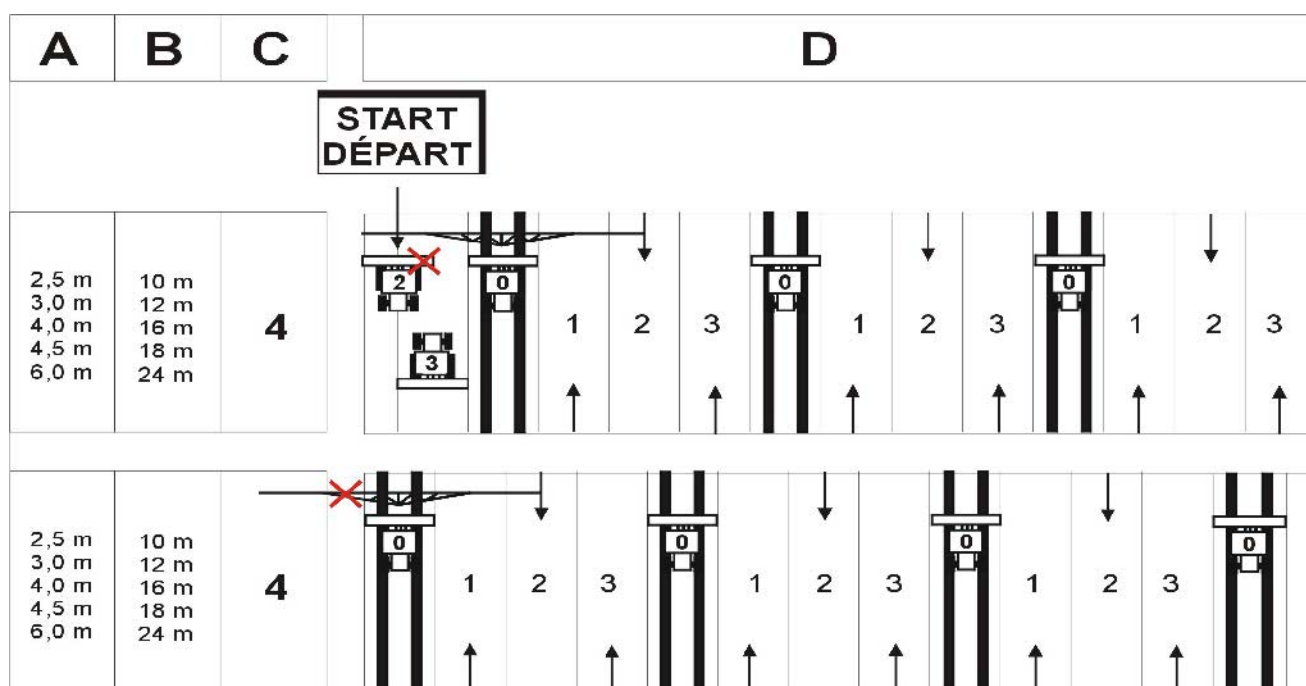


Fig. 18.10

18.4.1 Half side disengagement of seed metering shaft

On seed drills fitted with a seed metering shaft disengagement clutch (Fig. 18.11/1) the left hand side of the seed metering shaft can be shut off whereby the seed delivery to the coulters will be interrupted. Slide the spring loaded seed metering shaft disengagement clutch (Fig. 18.11/1) to the left hand side against the spring (Fig. 18.11/2) and twist in direction of the arrow:

Seed metering shaft engaged:

see Fig. 18.11.

Seed metering shaft half side disengaged:

see Fig. 18.12.



If it is intended that the tramline seed metering wheels do not sow, the shutter slides of the tramline metering wheels must be closed.

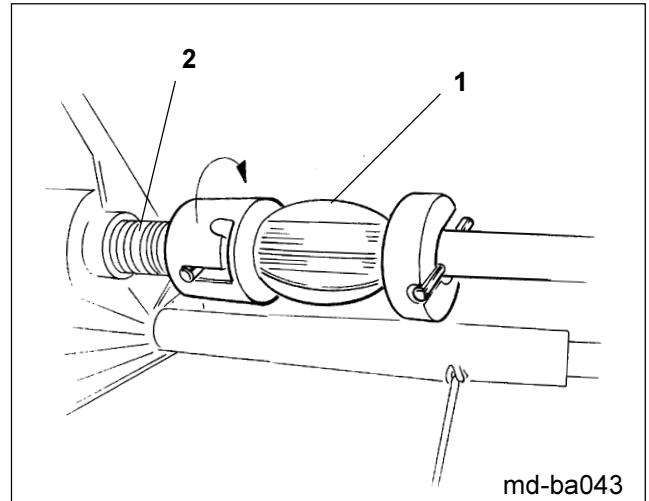


Fig. 18.11

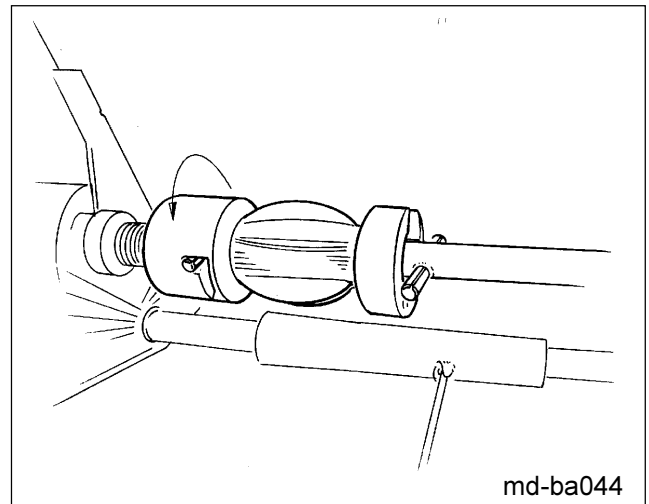


Fig. 18.12

18.5 Hints for creating tramlines with 2-bout and 6-plus bout switching rhythm

Seed drills

- with 2-bout switching rhythm are provided with tramline seed metering wheels only on the right hand side of the seed drill
- with 6-plus bout switching rhythms only on the left hand side of the seed drill.

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

The tramlines (see Fig. 18.13) are created during one travel in the field up and down.

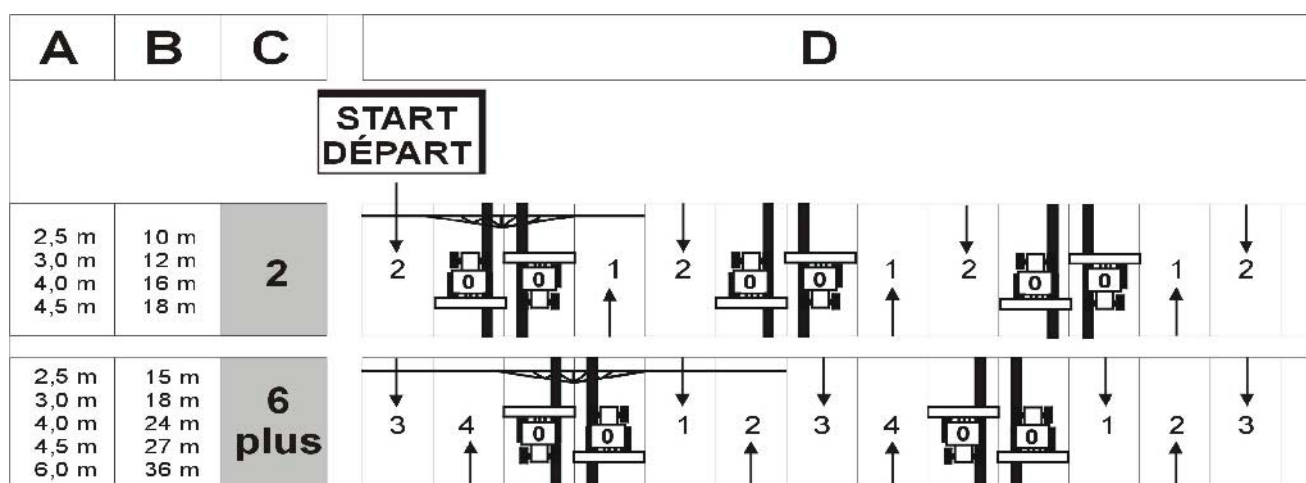


Fig. 18.13

18.6 Creating 18 m tramlines with two switch boxes on drills with a 4 m working width

On seed drills with 4.0 m working width tramlines with a spacing of 18 m (see Fig. 18.14) are created with the hydraulic double tramline control. Precondition is the equipment of the seed drill with two tramline switch boxes and two counter shafts fitted with drive wheels for the split-shaft feeding the seed metering wheels on the right hand side and on the left hand side of the seed drill. If one of the switch boxes shows the figure "0" the tramline seed metering shafts are switched off in the husbandry tractor's wheel mark.



The operation may only start on the left hand side of the field.
When starting to operate, both switch boxes must show the figure "1".

During operation both switch boxes show the bout switching rhythm as follows (please compare Fig. 18.14):

switch box	l.h.	(A)	1	2	0	4	5	6	7	8	9	10	11	12	13	14	15	0	17	18
switch box	r.h.	(B)	1	2	3	4	5	6	0	8	9	10	11	0	13	14	15	16	17	18

t162gb13

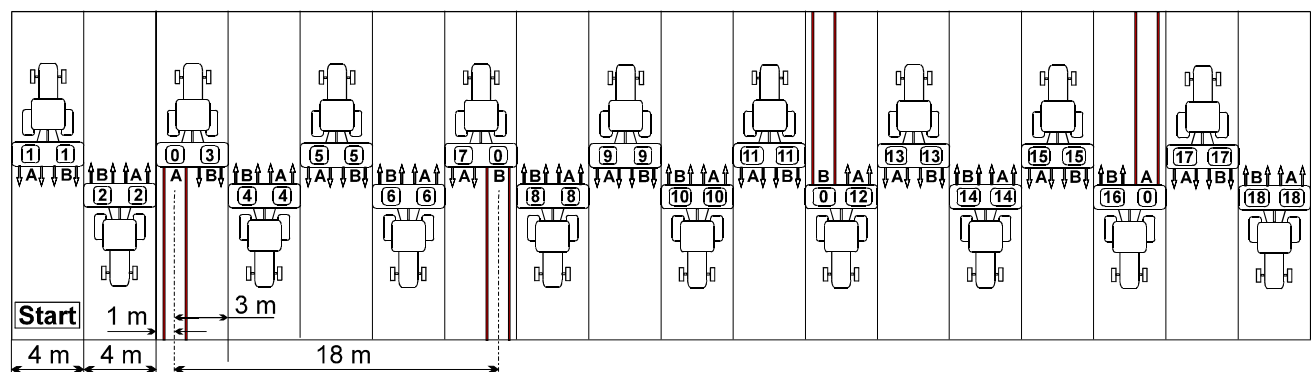


Fig. 18.14

18.7 Checking the tramlining control for correct function

The tramline seed metering wheels (Fig. 18.15/1) can rotate freely on the seed shaft. The tramline seed metering wheels are driven by drive pinion gears (Fig. 18.15/2) which are fitted to the counter shaft.

The counter shaft (Fig. 18.16/1) is driven by the seed shaft (Fig. 18.16/2). Both shafts are coupled by sprockets (Fig. 18.16/3). The sprocket on the counter shaft is equipped with a one way sprag clutch (Fig. 18.16/4). When creating tramlines the clutch interrupts the drive of the counter shaft. The clutch is actuated by a lever (Fig. 18.16/5) which is connected to the switch box (Fig. 18.16/6).

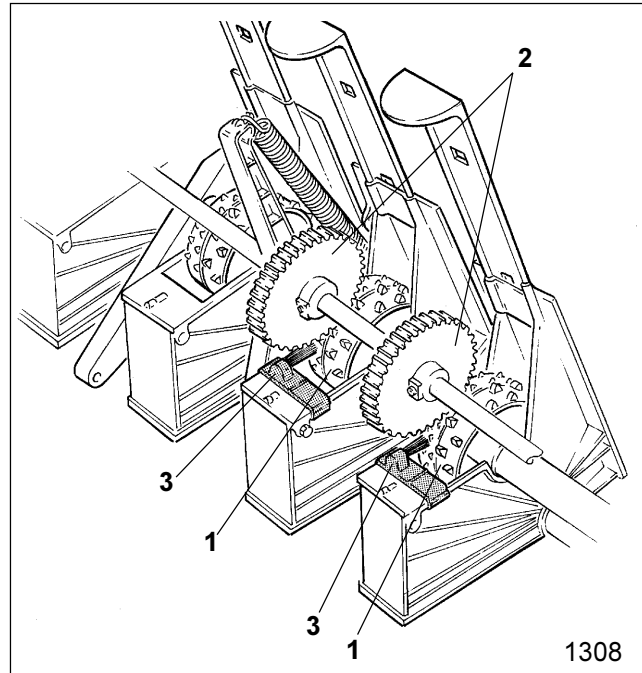


Fig. 18.15

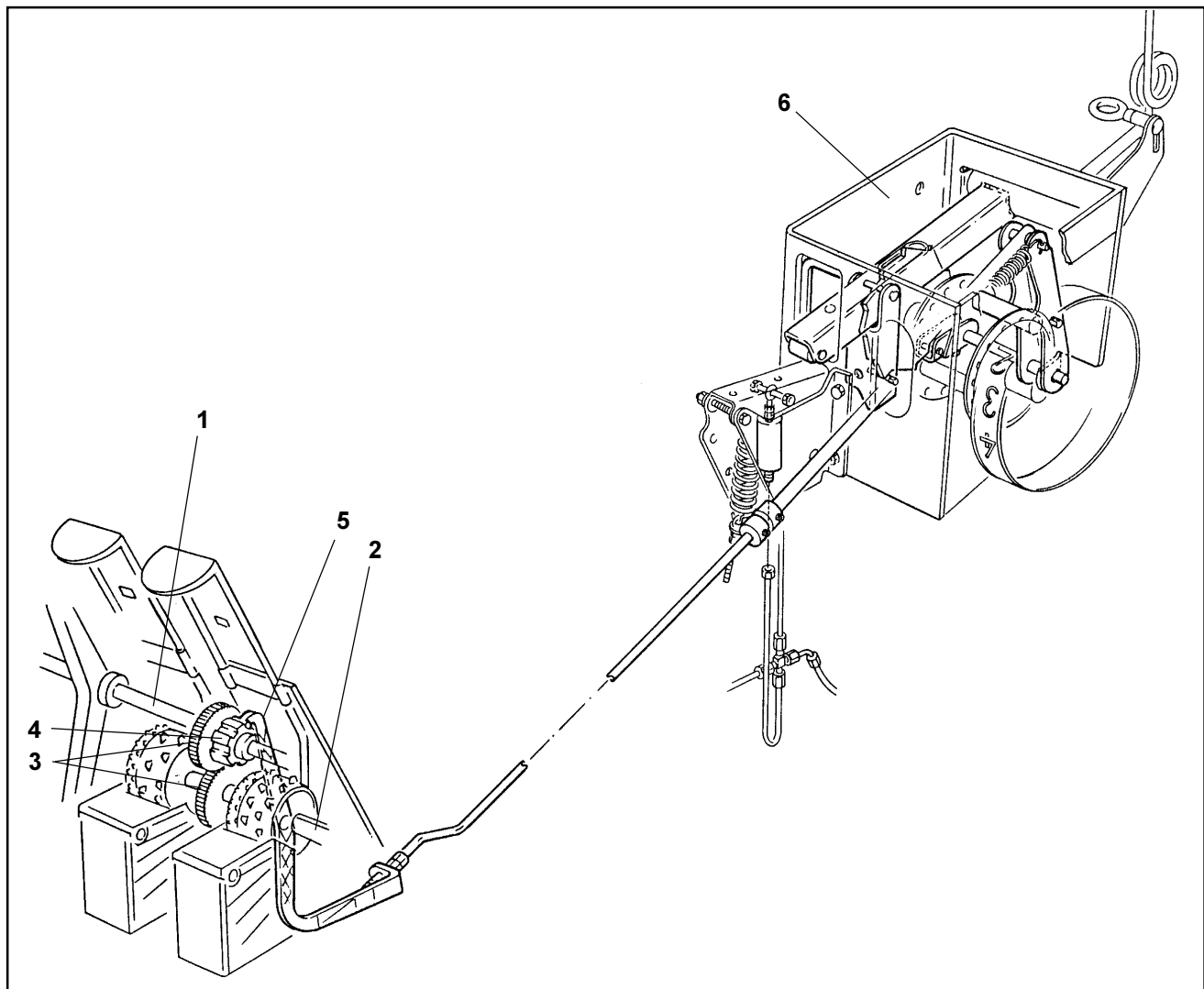


Fig. 18.16

Checking by actuating the control lever

Pull and let go the control lever (Fig. 18.17/1) on the switch box until the figure "0" appears in the window of the switch box.

When figure "0" is shown the clutch lever (Fig. 18.18/1) engages with the clutch (Fig. 18.18/2) and the counter shaft stops. The tramline seed metering wheels (Fig. 18.19/1) do not deliver any seed.

Pull the control lever on the switch box and let it go again. The switch box switches from "0" to "1". The clutch lever (Fig. 18.18/2) is released from the clutch (Fig. 18.18/2) and the tramline seed metering wheels are driven again by the drive pinions on the counter shaft.

The spacing between clutch (Fig. 18.18/2) and clutch lever (Fig. 18.18/1) should be approx. 5 mm (see Fig. 18.18).

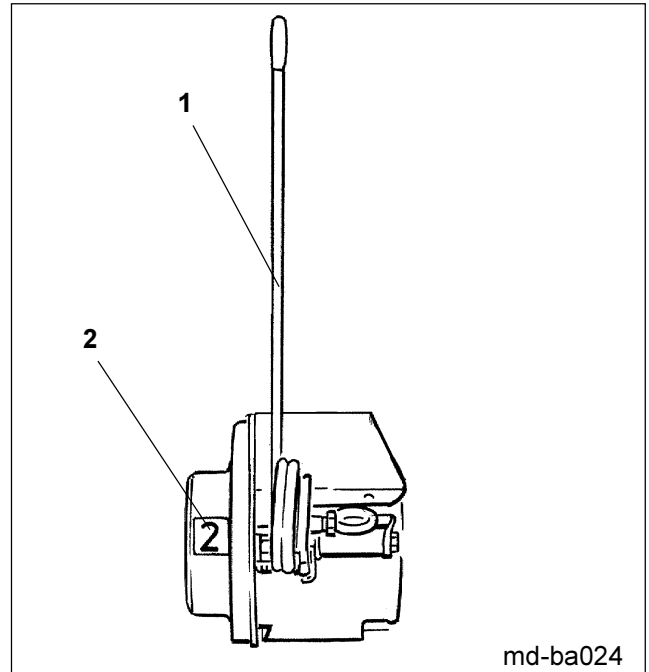


Fig. 18.17

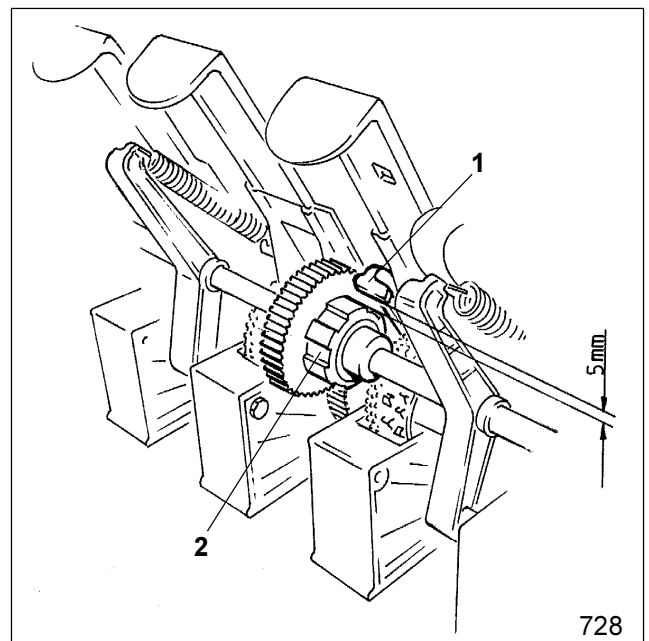


Fig. 18.18

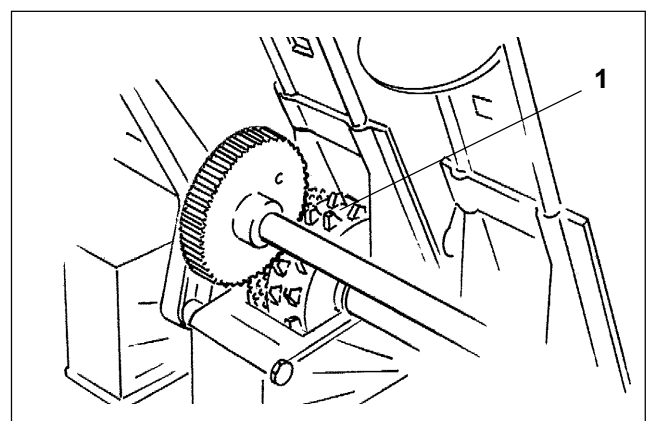


Fig. 18.19

Checking by actuating the control valve

Repeat the checking as described above. However do not switch over the switch box with the control lever (18.17/1) but actuate the control spool valve in the tractor cab. The switch box is then switched over by a hydraulic ram (Fig. 18.20/1).



Before actuating the control valve advise people to leave the danger area!

In case the hydraulic ram (Fig. 18.20/1) does not shift on the switch box, the following settings should be conducted:

- Pressurise the hydraulic ram (Fig. 18.20/1) from the tractor cab
- Slacken counter nut (Fig. 18.20/2)
- Turn hex. nut (Fig. 18.20/3) to the left hand (counter clockwise) until the switch box audibly switches over
- Turn hex. nut (Fig. 18.20/3) two further complete turns and retighten counter nut
- Actuate control spool valve and check whether the hydraulic ram switches the switch box to the next sequence/bout.

Checking operation after a storage or long periods of inactivity

If the seed drill has not been used for some time check whether the tramline seed metering wheels (Fig. 18.21/1) can easily rotate on the seed shaft.

Residues of dressing agents may cause jamming of the tramline seed metering wheels on the seed shaft. The tramline control will not function properly under these conditions. Turn by hand the tramline seed metering wheels which have been blocked by dressing agents to make them move freely again.



Never apply oil to the tramline seed metering wheels. The dressing agent would then act like glue and stick in this area.

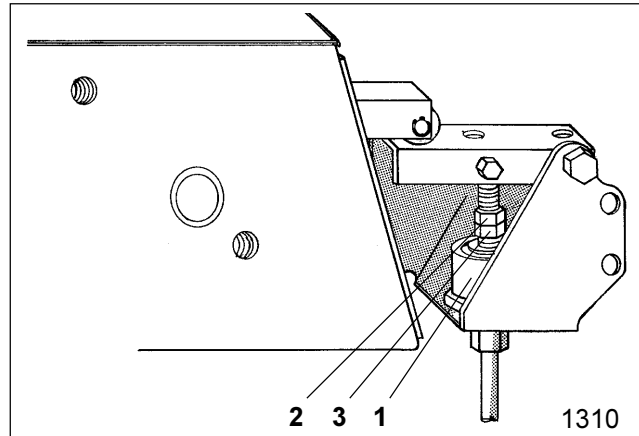


Fig. 18.20

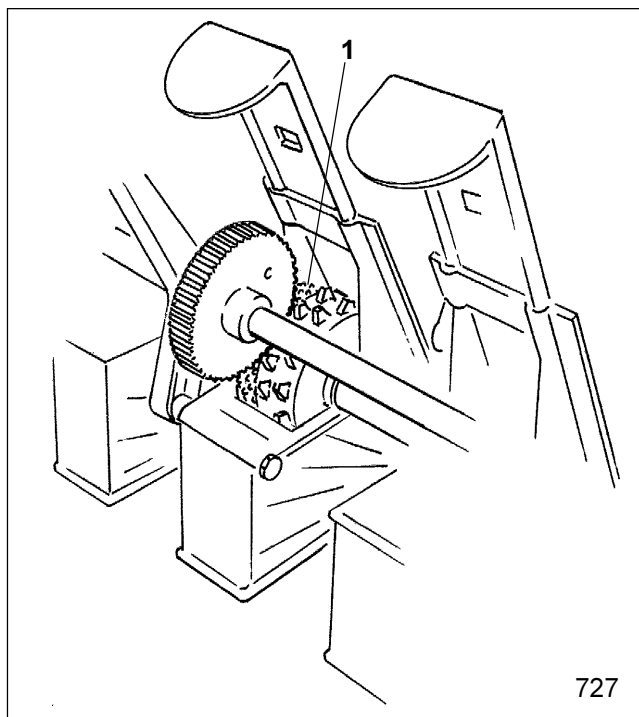


Fig. 18.21

Fine seed metering wheel brushes

The seed housings of the tramline seed metering wheels are provided with fine seed metering wheel brushes (Fig. 18.22/1). The fine seed metering wheel brushes clean the fine seed metering wheel to avoid sticking between drive pinion and fine seed metering wheel, especially so when sowing rape.

Renew the fine seed metering wheel brushes if necessary.

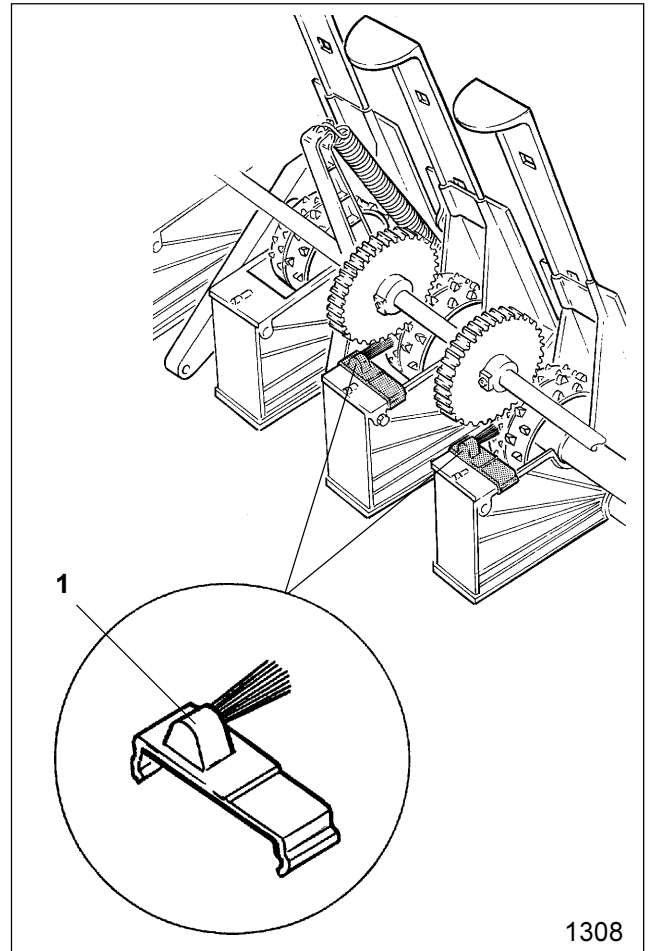


Fig. 18.22

18.8 Setting the drills tramline to the wheel track of the husbandry tractor

Tramlines are marks in the crop 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. However, should it be necessary, e. g. when purchasing a new husbandry tractor, to set the tramline system onto the wheel marks of your new tractor, proceed as follows:

- The swivel bearings (Fig. 18.23/1) on the counter shaft (Fig. 18.23/2) are spring loaded. Remove the coil springs (Fig. 18.23/3) and swing the counter shaft downwards (Fig. 18.24/1). Note that there is a distance spacer frame / shaft carrier bracket (Fig. 18.24/2), which secures the counter shaft from axial movement is pulled out of the hole of a seed housing.

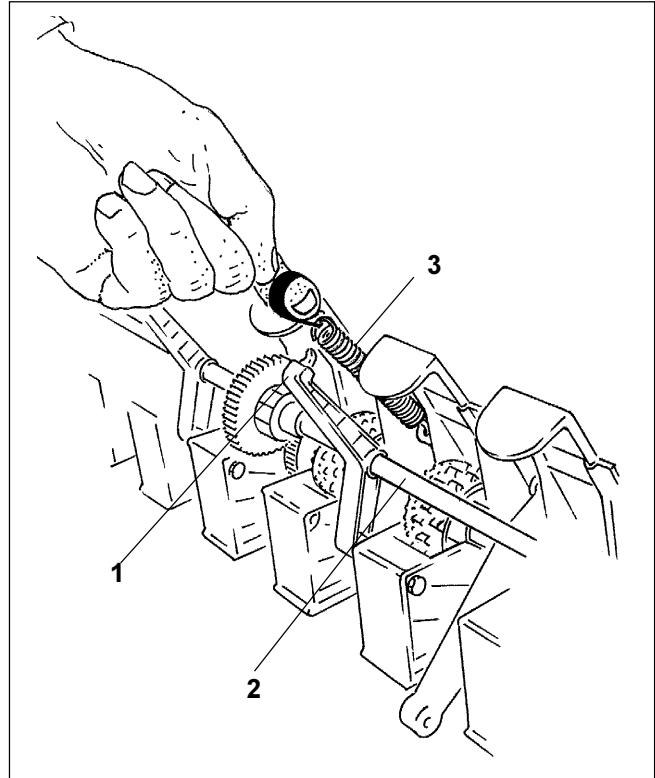


Fig. 18.23

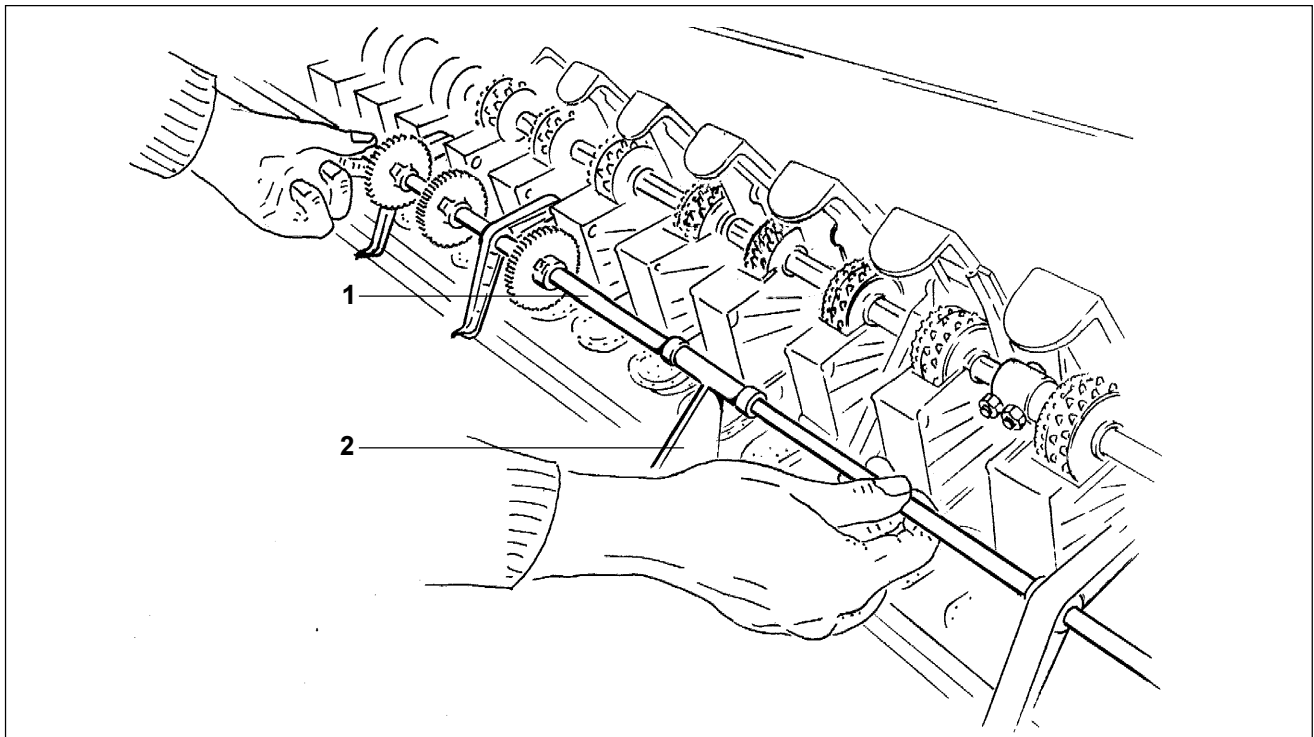


Fig. 18.24

- Mark where you wish the new tramline seed metering wheels (Fig. 18.25/1) to be by fixing the fine seed metering wheel brushes (Fig. 18.25/2) on to the new tramline seed housings. For creating one track up to three metering wheels, normally in exceptional cases also 4 or 5 seed metering wheels, can be shut off.



Seed drills with 2-bout switching rhythm have to be equipped with tramline seed metering wheels only on the right hand outer side of the seed drill. The spacing of the fine seed metering wheels, measured from the outer most right hand side of the seed drill, is one half of the husbandry tractor's wheel mark.



Seed drills with 6-plus bout switching rhythm have to be equipped with tramline fine seed metering wheels only on the left hand side of the seed drill. The spacing of the tramline seed metering wheels, measured from the outermost left hand side of the seed drill, is one half of the husbandry tractor's wheel mark.

- The seed wheels (Fig. 18.26) driven by the seed shaft (Fig. 18.26) are fixed to the seed shaft with threaded pins which are inserted in the fine seed metering wheels. Loosen the threaded pins of the new tramline seed metering wheels (see Fig. 18.26) until the new tramline seed metering wheels can freely move on the seed shaft.

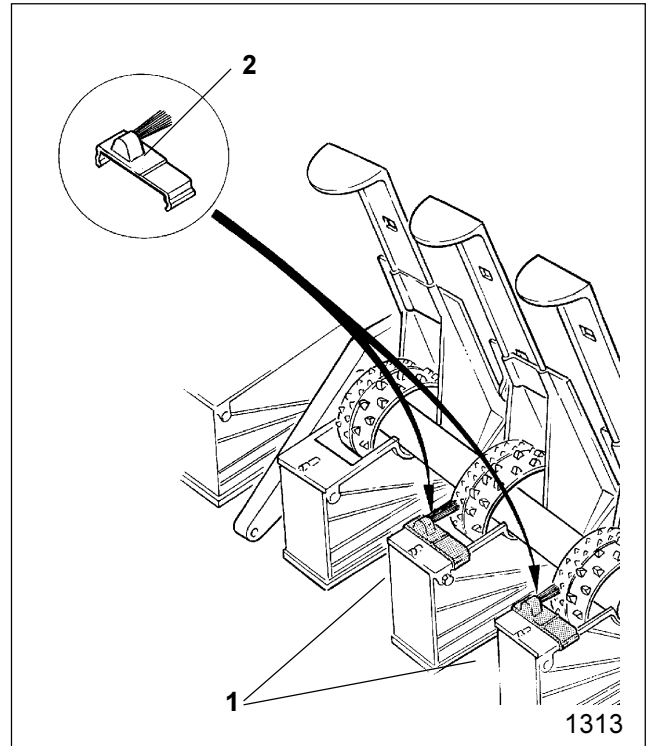


Fig. 18.25

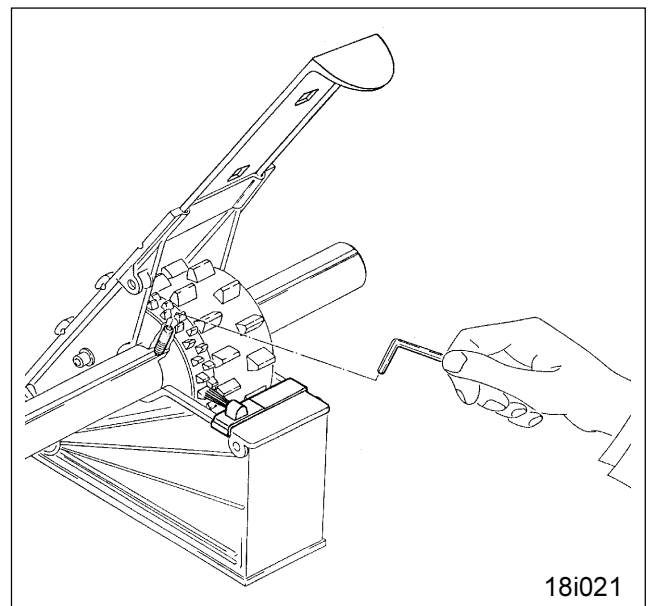


Fig. 18.26

- Unbolt the swivel bearings (Fig. 18.27/2) which are fixed by a hex. bolt (Fig. 18.27/1) to the old tramline seed metering wheels.
- Slacken the drive pinion (Fig. 18.27/3) and slide them along on the counter shaft to the desired position.
- Fix swivel bearing (Fig. 18.27/2) on the new tramline seed metering wheels.
- Fix the formerly used tramline seed metering wheels (Fig. 18.28) on the seed shaft. For this, drive the threaded pin into the fine seed metering wheel until the seed metering wheel is engaged with the metering shaft with a little play left. Never tighten threaded pins too much as this will cause a distortion of the seed metering wheels.
- Swing upwards the counter shaft (Fig. 18.29/1). At the same time slide the carrier bracket (Fig. 18.29/2) which secures the counter shaft from axial movement, into the hole of a seed housing. Axially secure the carrier bracket by using the sliding setting rings (Fig. 18.29/3).

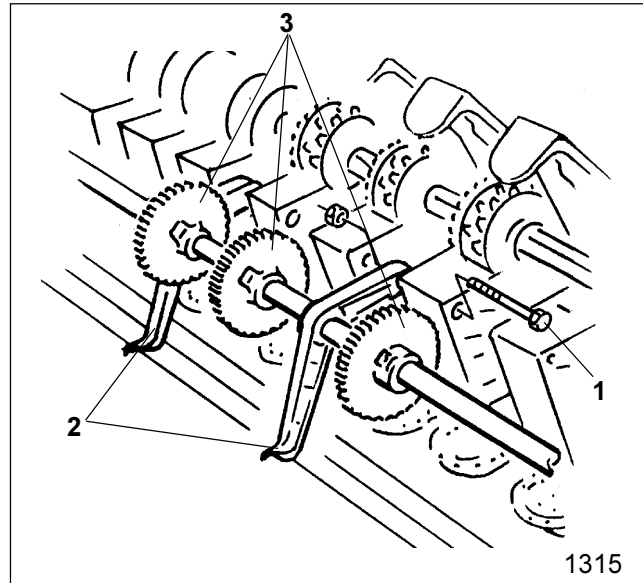


Fig. 18.27

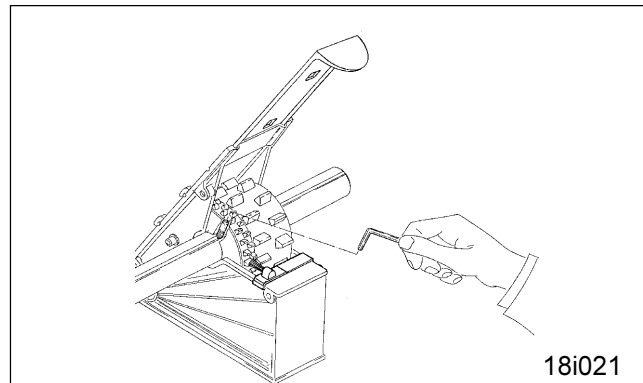


Fig. 18.28

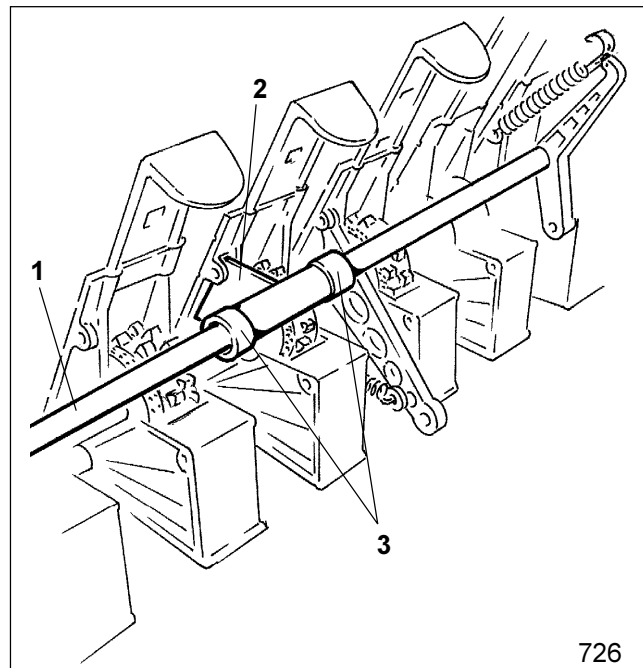


Fig. 18.29

- Let sprocket engage with the drive pinion (Fig. 18.30/1) on the tramline fine seed metering wheels (Fig. 18.30/2). Fix drive pinion on the counter shaft.
- Engage the drive pinions (Fig. 18.31/1) of the counter shaft and of the seed shaft.
- Reattach the coil springs (Fig. 18.31/2) onto the swivel bearings (Fig. 18.31/3).
- Check tramline control for function (see above).



If your seed drill is equipped with a tramline marker device, readjust the marker discs as desired.

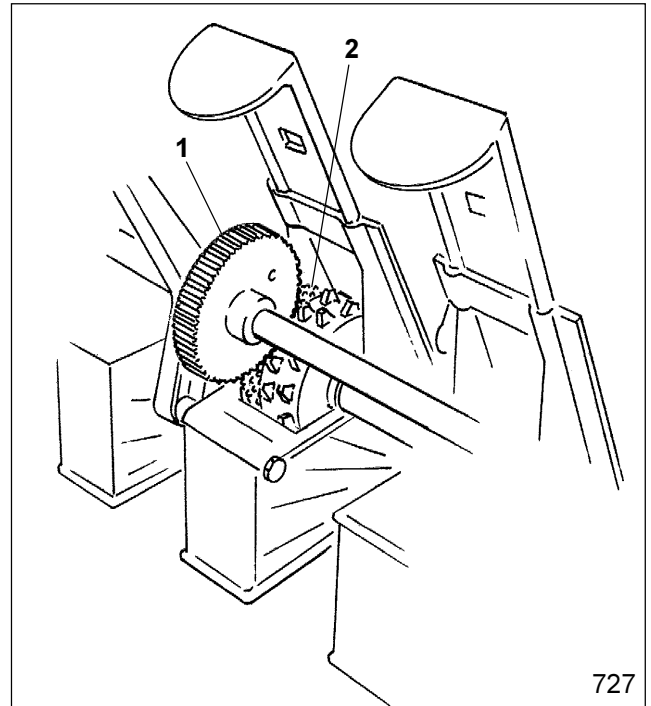


Fig. 18.30

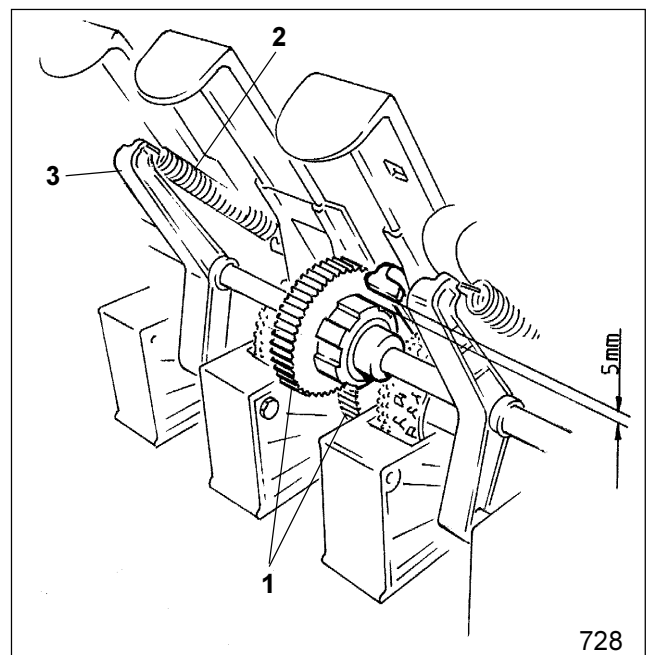


Fig. 18.31

18.9 Converting the tramline switch box to another bout rhythm

The spacing of the tramlines (see table above) corresponds to the working width of the fertiliser broadcaster or of the field sprayer. The rhythm for creating tramlines is determined by the ratchet wheel drum located inside the switch box (Fig. 18.32). If it is required to create tramlines with another rhythm, the ratchet drive wheel drum (Fig. 18.32/1) in the switch box has to be exchanged or converted.

For the 2-, 3-, 4- and 6-bout rhythm the ratchet wheel (Fig. 18.32/1) need not be exchanged. For converting the switch box for another bout rhythm sequence within this group, only the shift rollers placed within the ratchet wheel need to be repositioned or shift rollers need to be repositioned in the ratchet wheel drum or added as described in para 18.9.1.

When converting the switch box to a 5-, 7-, 8- and 9-bout rhythm, the ratchet wheel drum must always be replaced (see para. 18.10).

18.9.1 Converting the switch box from a 2-, 3-, 4- and 6-bout rhythm to another rhythm within this group

For converting the switch box from a 2-, 3-, 4- and 6-bout rhythm to another bout rhythm sequence within this group the shift rollers on the ratchet wheel must be repositioned or added.

- Relieve the hydraulic pressure from the system and remove the hydraulic hose from the tractor socket.
- Remove the protective cover (Fig. 18.32/4) after slackening the two tin screws (Fig. 18.32/5).
- Remove the clamp (Fig. 18.32/6) and pull them off together with the counter wheel (Fig. 18.32/3)
- Take off the securing disc (Fig. 18.32/7) after having removed the circlip (Fig. 18.32/8).
- Now the shift rollers are freely accessible (Fig. 18.32/2) and may be inserted into the ratchet wheel drum as shown in para. 18.9.2 after having pulled out the pins already in place (Fig. 18.32/9).

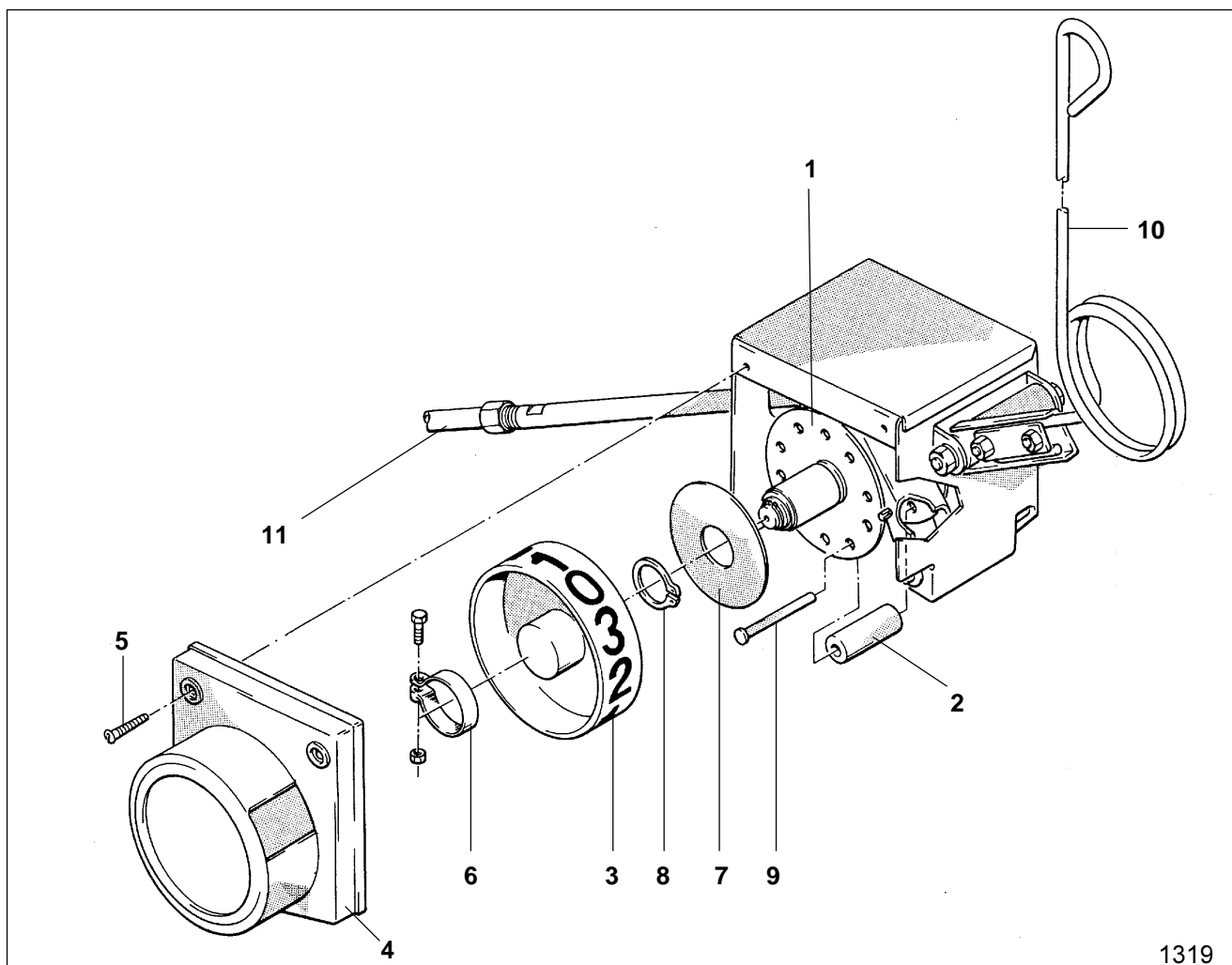


Fig. 18.32

Assembly of the switch box

- Mount securing disc (Fig. 18.33/7) and circlip (Fig. 18.33/8).
- Now provide the counter wheel (Fig. 18.33/3) with a new number tape as shown in para. 18.9.2 and first fix loosely with a clamp (Fig. 18.33/6) to the ratchet wheel drum.
- Switch over the switch box on the control spring (Fig. 18.33/10) until the clamping tube (Fig. 18.33/11) is pulled by a trip roller (Fig. 18.33/2) and held in this position. The protective cover (Fig. 18.33/4) is held to the switch box and the counter wheel (Fig. 18.33/3) is turned until the figure "0" shows up in the window of the protective cover.

After switching over, at the 2-fold sequence again a “0” must appear due to the two consecutive following trip rollers and the clamping tube must be in the pulled position by the shift roller

- Fix the counting wheel (Fig. 18.33/3) by the clamp (Fig. 18.33/6) and mount the protective cover (Fig.

18.33/4).

- Switch over the switch box by the control spring (Fig. 18.33/10) until the counter wheel (Fig. 18.33/3) has made at least three complete turns and check whether the switch box functions properly, i. e. whether in every "0" position the spindle clamping tube (Fig. 18.33/11) is pulled properly.

18.9.2 Ratchet wheel drums and number tapes of the 2-, 3-, 4- and 6-bout sequence

In Fig. 18.34 are illustrated the ratchet wheel drums and the number tapes that are identified by the corresponding column of figures. The figure for example "2" on the top left hand side of the Fig. 18.34 indicates the ratchet wheel drum and the number tape required for a 2-bout switching sequence or rhythm.

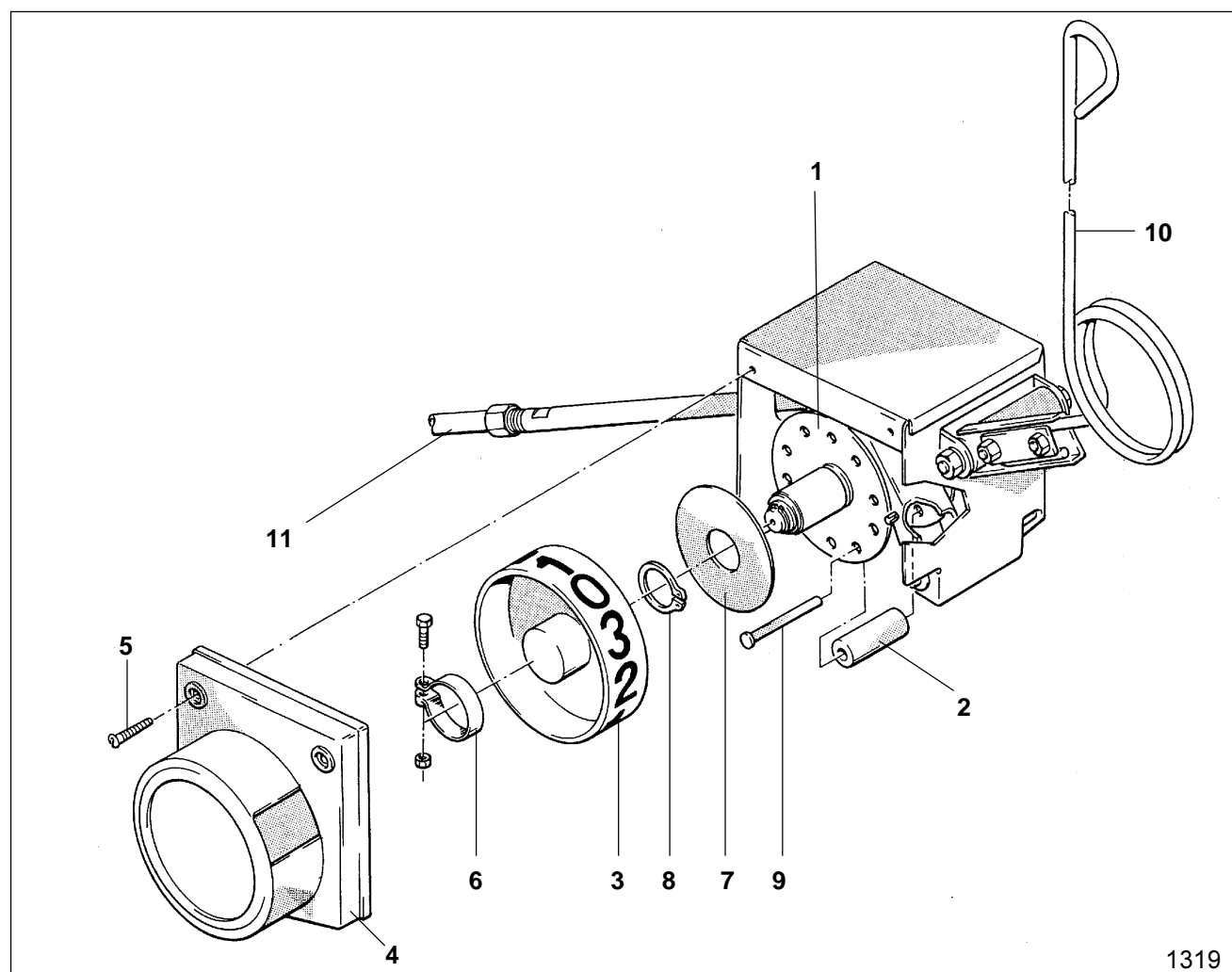


Fig. 18.33

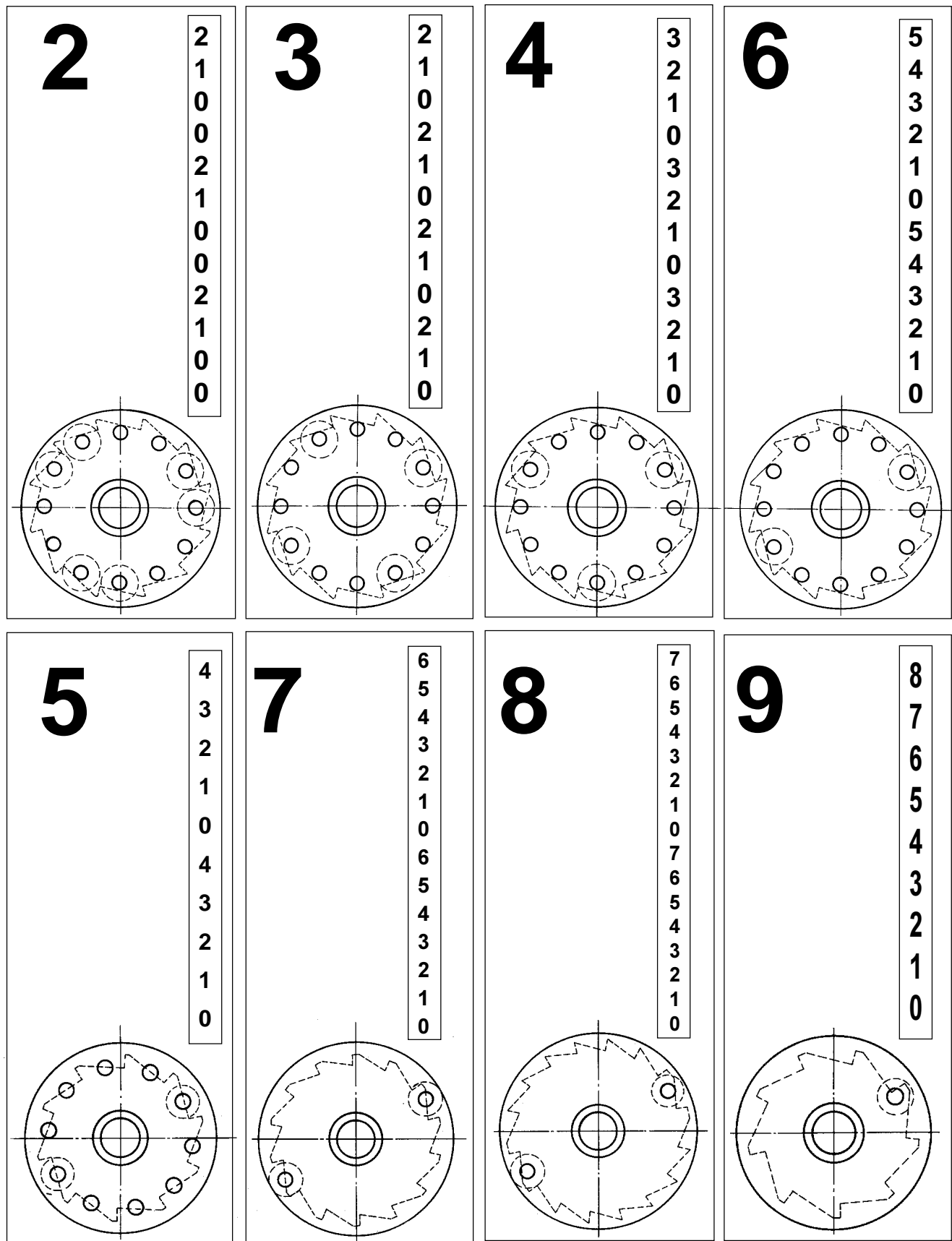


Fig. 18.34

18.10 Converting the switch box to a 5-, 7-, 8- or 9-bout rhythm or from one type of rhythms to another

A new ratchet wheel drum Fig. 18.35/1) has to be inserted into the switch box when converting

- from a 2-, 3-, 4- or 6-bout switching rhythm to a 5-, 7-, 8- or 9-bout rhythm
- from a 5-, 7-, 8- or 9-bout switching rhythm to a 2-, 3-, 4- or 6-bout rhythm
- from a 5-, 7-, 8- or 9-bout switching rhythm to another rhythm within this group.

Relieve the hydraulic system from pressure and remove the hydraulic hose from the tractor socket.

Remove the protective cover (Fig. 18.35/2) after having slackened the two tin screws (Fig. 18.35/3).

Slacken clamp (Fig. 18.35/4) and pull off together with the counter wheel (Fig. 18.35/5).

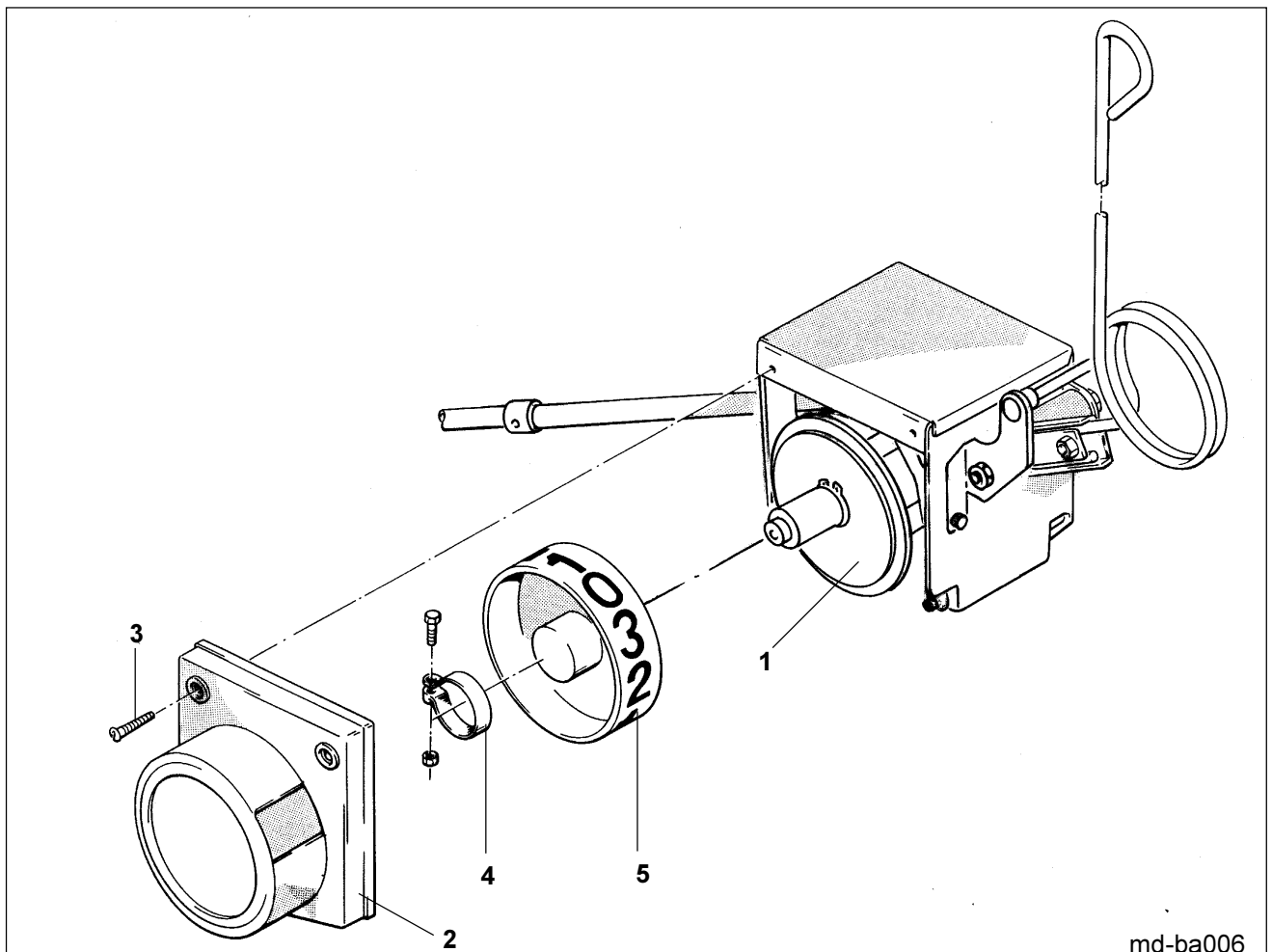


Fig. 18.35

md-ba006

Loosen coil spring (Fig. 18.36/1).

Pull out pin (Fig. 18.36/2) after having removed the split pin (Fig. 18.36/3).

Remove ratchet lever (Fig. 18.36/4).

Detach from the casing and the coil spring (Fig. 18.37/1).

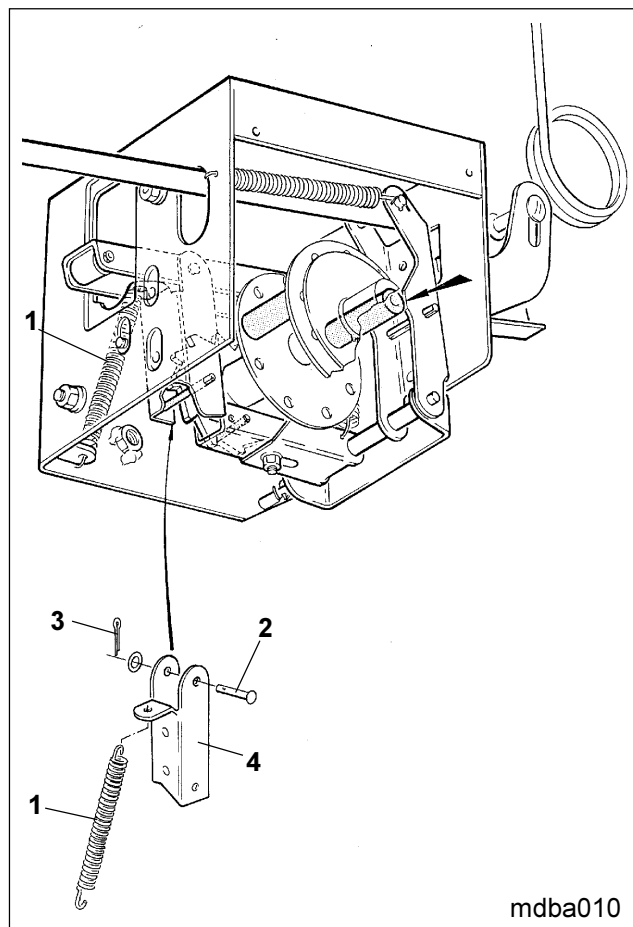


Fig. 18.36

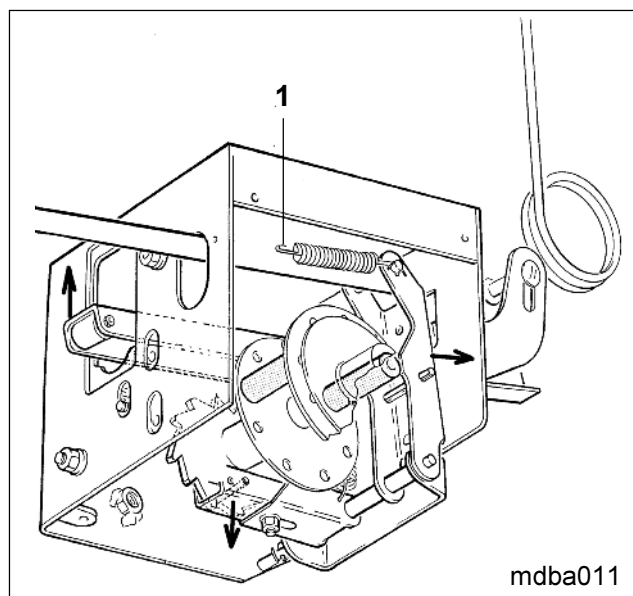


Fig. 18.37

Loosen securing ring 15 x 1,5 (Fig. 18.38/1).
Press in the direction of the arrow marked parts in Fig. 18.37 and pull the ratchet wheel (Fig. 18.38/2) together with the washers (Fig. 18.38/3) and the collar bushes (Fig. 18.38/4) off the switch box main shaft.

Fitting the new ratchet wheel drum

The stop nut (Fig. 18.39/1) is usually a mushroom head bolt M6 x 20, DIN 603 and should be used for the ratchet wheel drums travel (Fig. 18.39/2)

Before fitting the ratchet wheel drum for the 5-bout switching rhythm this bolt has to be exchanged for a flat mushroom head bolt M 6 x 30, DIN 603.

When converting to a 8-bout switching rhythm the advice in para. 18.11 should be noted.

Press the parts which are marked by an arrow in Fig. 18.37 in direction of the arrow.

Apply grease to the running surface of the collar bushings (Fig. 18.40/4) and push it together with the new ratchet wheel (Fig. 18.40/2) on to the switching shaft and secure by using washers (Fig. 18.40/3) and circlip (Fig. 18.40/1).

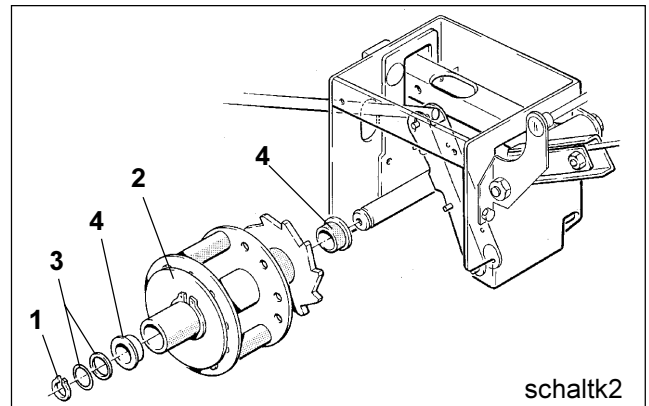


Fig. 18.38

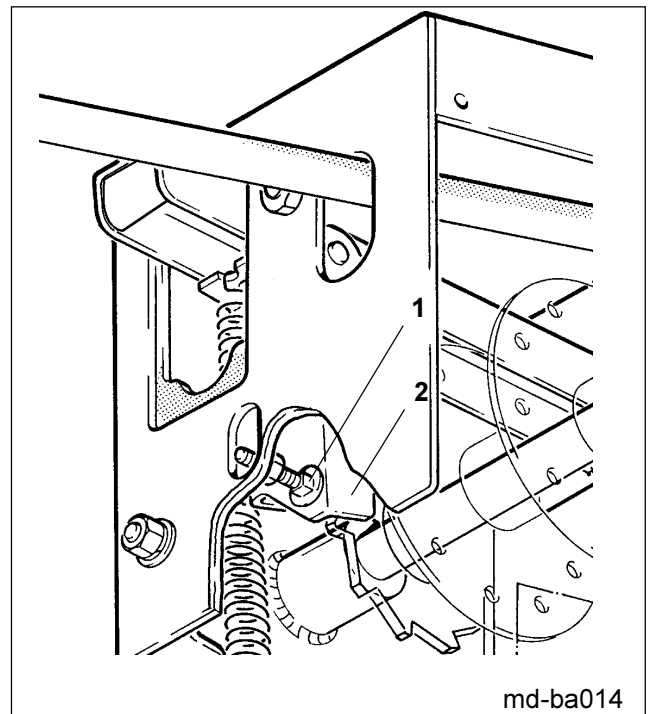


Fig. 18.39

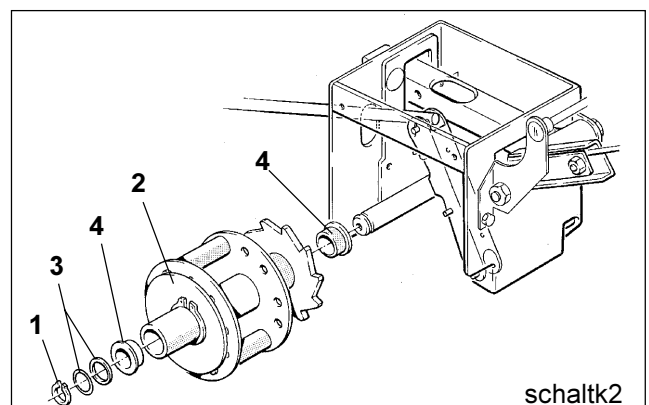


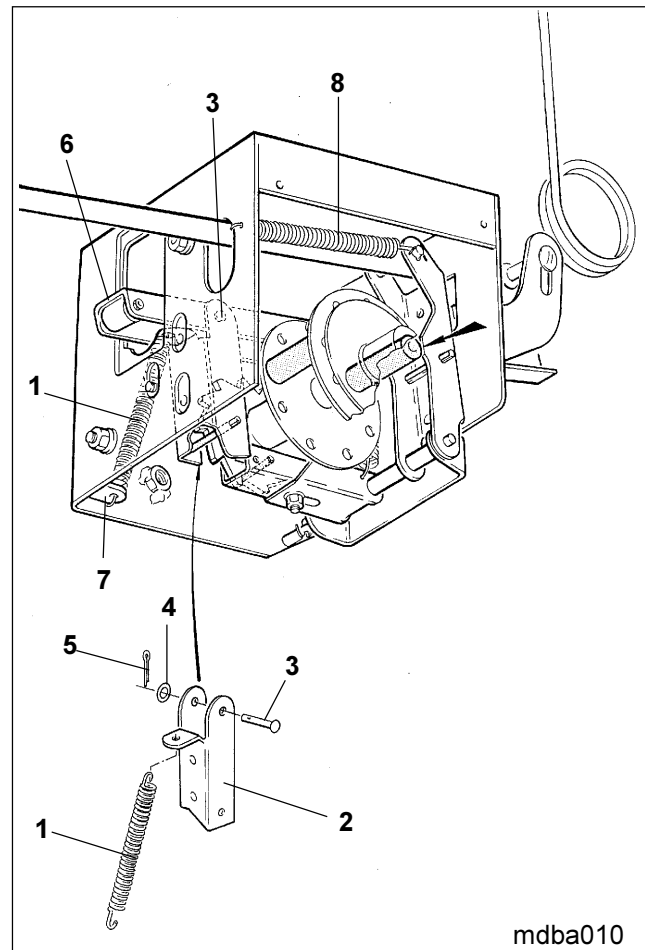
Fig. 18.40

Reattach the coil spring by means of it's hook (Fig. 18.41/1) into the hole provided on the ratchet lever (Fig. 18.41/2).

Fit pulling ratchet (Fig. 18.41/2) with safety pin (Fig. 18.41/3), disc (Fig. 18.41/4) and new split pin 1,6 x 16, DIN 94 (Fig. 18.41/5) to lever (Fig. 18.41/6).

Hook coil spring (Fig. 18.41/1) into the pocket (Fig. 18.41/7) of the stop plate.

Affix coil spring (Fig. 18.41/8).



mdba010

Fig. 18.41

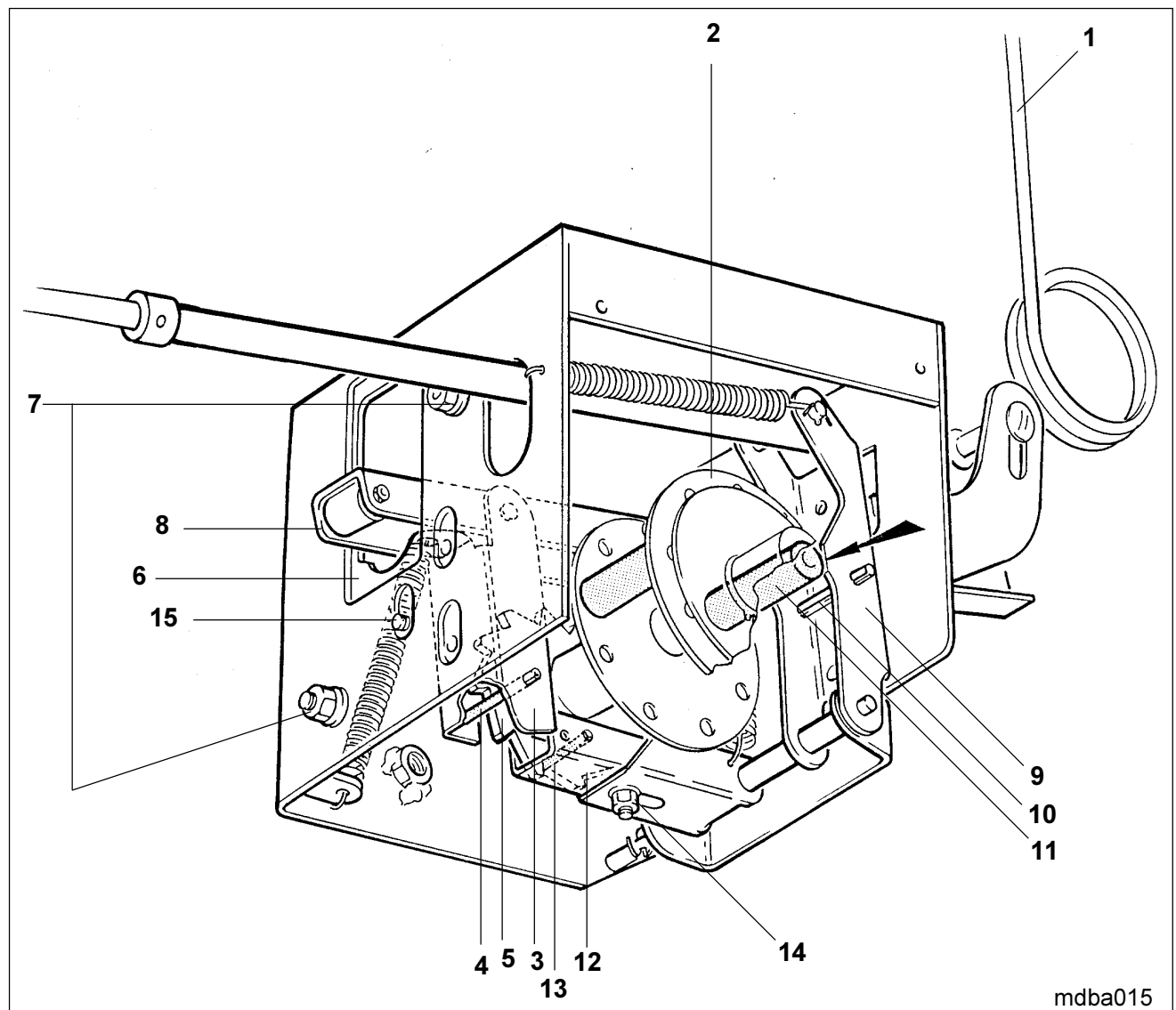
18.10.1 Description of the function and basic setting of the switch box



Before carrying out any change to the basic setting of the switch box, please check first, whether the switch box with the new ratchet wheel functions in the standard basic setting as set by the factory. At first proceed as described in para. 18.7. If, when checking, the switch box does not function properly, the base setting should be carried out as follows:

When actuating the lever (Fig. 18.42/1) the ratchet wheel (Fig. 18.42/2) is turned by the ratchet lever (Fig. 18.42/3). The expansion bush (Fig. 18.42/4) turns the ratchet wheel (Fig. 18.42/5). The stop plate (Fig. 18.42/6) limits the travel of the pulling ratchet lever (Fig. 18.42/3) and consequently controls the amount of rotation of the ratchet wheel drum.

- Set the stop plate (Fig. 18.42/6) in such a way that the ratchet wheel is turned by one tooth division when actuating the ratchet pulling lever. For this, two hex. nuts (Fig. 18.42/7) have to be slackened and the stop plate has to be moved correspondingly either upwards or downwards. Set the stop plate sideways in such a way, that the lever (Fig. 18.42/8) is positioned centrally in the window of the stop plate. After finishing the setting tighten hex nuts (Fig. 18.42/7) firmly.



mdba015

Fig. 18.42



The tripping lever (Fig. 18.42/9) is resting with the roll pin expansion bush (Fig. 18.42/10) on the driven part of the ratchet wheel drum (Fig. 18.42/2).

- Operate the actuating lever (Fig. 18.42/1) repeatedly, until one shifting roller (Fig. 18.42/11) lifts away the roll pin expansion bush (Fig. 18.42/10) from the ratchet wheel (Fig. 18.42/2).

The ratchet wheel drum is set correctly when all shifting rollers (Fig. 18.42/11) come to rest in 2 to 3 mm of the highest point (see arrow in Fig. 18.42) of the ratchet tripping levers cam (Fig. 18.42/9). Conduct the setting on the retaining ratchet (Fig. 18.42/12) as follows:

- The ratchet drum wheel will be stopped after actuating the operating lever (Fig. 18.42/1) by the expansion bush roll pin (Fig. 18.42/13) of the retaining ratchet. The setting is conducted by shifting the retaining ratchet (Fig. 18.42/12). First slacken inner hex. bolt M 6 x 12 (Fig. 18.42/14), this must be retightened after every new setting.

Checking the basic setting

Actuate lever (Fig. 18.42/1) repeatedly until the ratchet wheel drum has made at least four complete turns. Whilst doing this ensure that you check that the shifting rollers (Fig. 18.42/11) come to a rest within 2 to 3 mm before the highest point of the tripping lever cam (see arrow in Fig. 18.42) and whether the ratchet wheel is faultlessly turning.

The pulling ratchet lever (Fig. 18.42/3) must freely operate at every shifting procedure but it must not jump over. Adjust stopping bolt (Fig. 18.42/15) accordingly.

Fitting the counter wheel

- Provide the counter wheel (Fig. 18.43/1), as described in para. 18.9.2 with a new number tape and first affix loosely with the aid of a clamp (Fig. 18.43/2) on the ratchet wheel.
- Actuate lever on the control spring (Fig. 18.43/3) until the clamping tube (Fig. 18.43/4) is pulled and held in position. Hold protective cover (Fig. 18.43/5) to the switch box and turn the counter wheel (Fig. 18.43/1) until the figure "0" can be seen in the window of the protective cover.

When shifting over the 2-bout switching rhythm, due to its two consecutively following shifting rollers, a "0" will appear again and the clamping tube must be pulled by the shifting roller.

- Clamp the counter wheel (Fig. 18.43/1) with the clamp (Fig. 18.43/2) and fix the protective cover (Fig. 18.43/5) with two self tapping screws (Fig. 18.43/6).

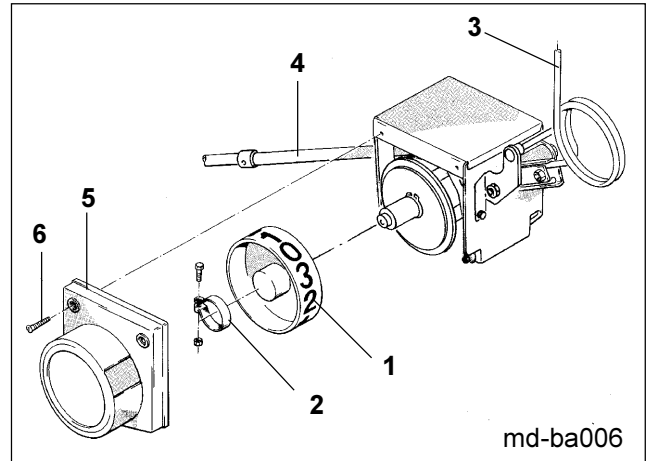


Fig. 18.43

18.11 8-bout shift rhythm

When converting the switch box to an 8-bout rhythm, proceed as described in para. 18.10. Additionally the following assembly should be conducted:

- Remove lever (Fig. 18.44/1) after slackening the hex. bolt M 10 x 100, DIN 931 (Fig. 18.44/2) .
- Mount stop plate (Fig. 18.44/3) from the outside to the switch box.
- Grind gap for the lug (Fig. 18.44/5) according to drawing Fig. 18.44 into the wall of the switch box.
- The flat iron bracket (Fig. 18.44/4) is used for mounting the fixing parts of the hydraulics and it should be bolted to these parts later on.
- Remove expansion roll pin of the retainer ratchet (Fig. 18.45/1).
- Drill a new hole into the retainer ratchet according to Fig. 18.45 ($\varnothing 5_{H12}$ mm)
- Drive new expansion roll pin 5 x 33, DIN 1481 (Fig. 18.45/2) into the retainer ratchet
- Remove expansion roll pin of the tripping lever (Fig. 18.46/1)
- Drill a new hole into the tripping lever according to Fig. 18.46 ($\varnothing 6_{H12}$ mm)
- Drive new expansion roll pin 6 x 45, DIN 1481 (Fig. 18.46/2) into the tripping lever (Fig. 18.46/1).
- Reassemble dismantled parts inside the switch box.

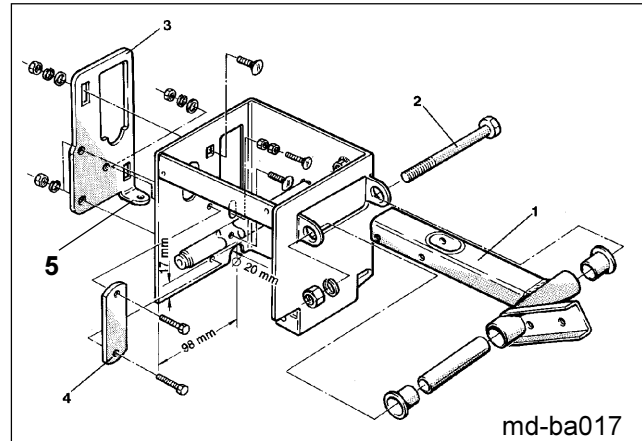


Fig. 18.44

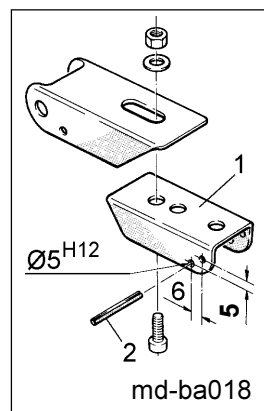


Fig. 18.45

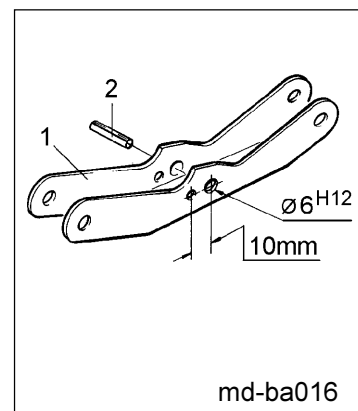


Fig. 18.46

19.0 Tramline marker unit (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. 19.1/1) of the tramline marker unit 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.

When the drive to the seed metering wheels is switched off at the switch box, both marker discs (Fig. 19.1/1) of the tramline marker unit drop into work, marking the soil and creating tramlines.

The marker discs (Fig. 19.2/1) of the tramline marker unit are lifted out of work when all seed metering wheels are in operation, i. e. when no new tramlines are required.



The hydraulically actuated tramline marker unit, the hydraulically actuated switch box for the tramline control and the hydraulically actuated track markers are coupled together. Connect the hydraulic rams to a single acting control spool valve of the tractor.

When the control valve is actuated for example, at the headland, the track markers are switched over and the switch box switches on to the next bout figure. This is displayed to the operator in the switch box window. When the switch box shows the figure "0" the tramline seed metering wheels disengage and the pre-emergence marker disc unit is lowered into work.



When actuating the control spool valve, the rams of the hydraulic marker change over system, the switch box ram and the pre-emergence marker units are all simultaneously pressurised, depending on the switching position of the switch box! Advise people to leave the area of danger! Danger of injury from moving parts!

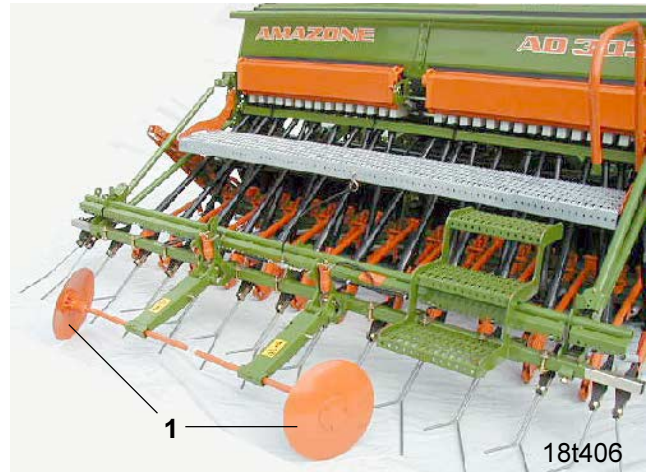


Fig. 19.1

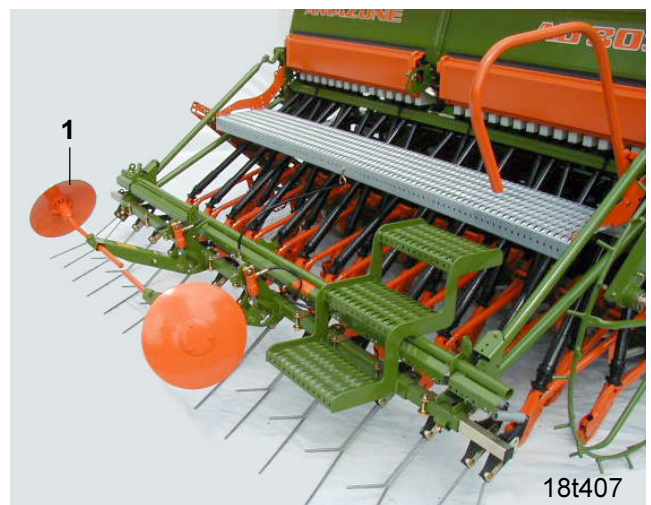


Fig. 19.2

19.1 Fitting

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

- Attach the extra coverage following harrow to the seed drill.
- Attach two fixing brackets (Fig. 19.3/1) to the extra coverage following harrow.
- Mount the marker disc carrier arm (Fig. 19.3/3) by means of the pins (Fig. 19.3/4) and secure with the expansion pin (Fig. 19.3/5).
- Insert the marker discs (Fig. 19.3/6) into the marker disc carriers (Fig. 19.3/3) and clamp by using hex. bolts (Fig. 19.3/7).
- Connect the hydraulic hoses (Fig. 19.3/8) to both hydraulic rams (Fig. 19.3/9).
- A control valve (Fig. 19.4/1) has been fixed to the switch box of the tramlining control switching box. Bring together the hydraulic hoses (Fig. 19.3/8) on a T-connecting bracket and connect to the control valve (Fig. 19.4/1).
- Route hydraulic hoses onto your seed drill by the use of plastic wire ties.

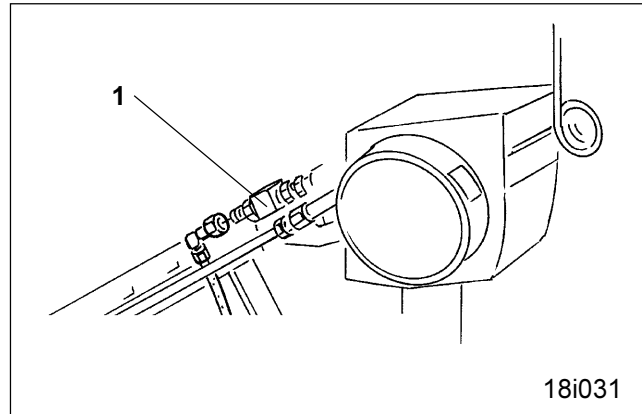


Fig. 19.4

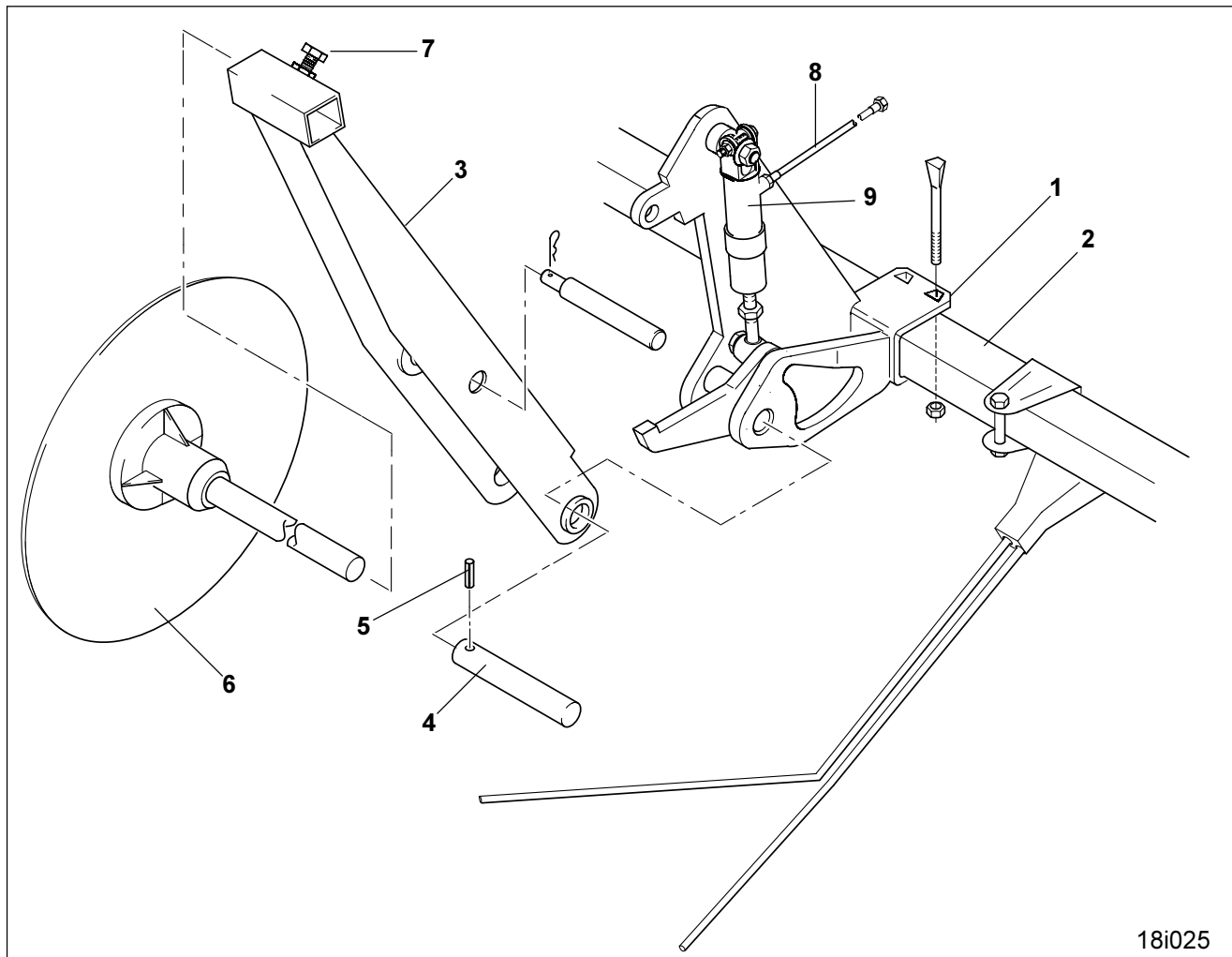


Fig.19.3



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 to a single acting control spool valve on the tractor.



When actuating the control spool valve, the hydraulic rams of the marker change over for the track markers, the switch box and the pre-emergence tramline marker unit are all simultaneously pressurised, depending on the switching position of the switch box!

**Advise people to leave the area of danger!
Danger of injury from moving parts!**

- Check hydraulic hoses for leakages.

19.2 Setting the control valve

The hydraulic ram of the tramline marker unit is controlled by a control valve (Fig. 19.5/1). The control valve (Fig. 19.5/1) is connected to the switch box of the tramlining control unit by a conrod (Fig. 19.5/2).

When supplied the control valve (Fig. 19.5/1) has been set by the factory so that it faultlessly switches.:

- In position "0" of the switch box (Fig. 19.5/3)
- the switching conrod (Fig. 19.5/4) is pulled,
 - the lever (Fig. 19.5/5) of the control valve is advanced by one bout,
 - the marker discs are lowered.

After switching over the switch box to position "1"

- the lever (Fig. 19.5/5) of the control valve switches back,
- the marker discs are raised.

In case the control valve does not function properly, the control valve should be set as follows:

- set switch box (Fig. 19.5/3) to switching position "1",
- slacken the setting ring (19.5.6), press the lever (Fig. 19.5/5) of the control valve by hand completely to the rear and firmly tighten the setting ring again.

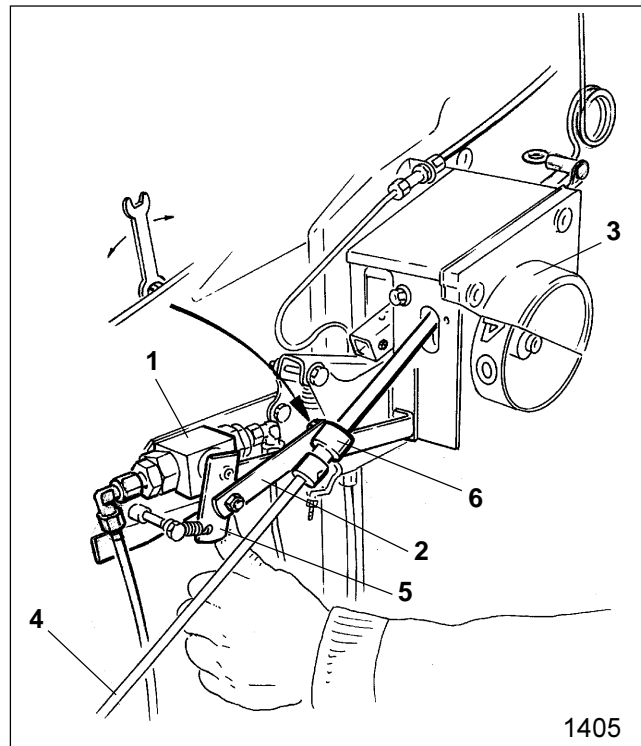


Fig. 19.5

19.3 Setting the pre-emergence marker discs

The pre-emergence marker discs (Fig. 19.6/1) trace the tramlines created by the tramlining control unit and have to be set to the correct track width.

- Slacken hex bolts (Fig. 19.6/2).
- Move the marker discs (Fig. 19.6/1) in the marker disc carrier 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. 19.6/2).

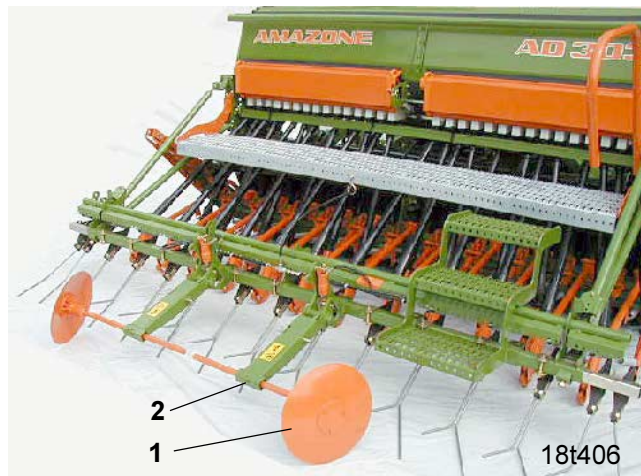


Fig. 19.6

Hints

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

Tramlining control units with 2-bout switching rhythm or 6-plus bout switching rhythm are provided with seed metering wheels that can be disengaged for creating tramlines only on one side of the drill. Therefore only fit one of the two marker discs (Fig. 19.6/1) when using these switching rhythms. Set this remaining marker disc in such a way that when drilling up and down in the field, the track width of the husbandry tractor is traced.

19.4 Transport on public roads

For transport the marker disc carriers (Fig. 19.7/1) should be locked on the fitting brackets (Fig. 19.7/2) by pins (Fig. 19.7/3) and secured by using R—clip pins (Fig. 19.7/4). The marker disc carriers (Fig. 19.7/1) 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. 19.7/5).



Before any transport on public roads the marker discs (Fig. 19.7/5) have to be removed from the marker disc carriers (Fig. 19.7/1).

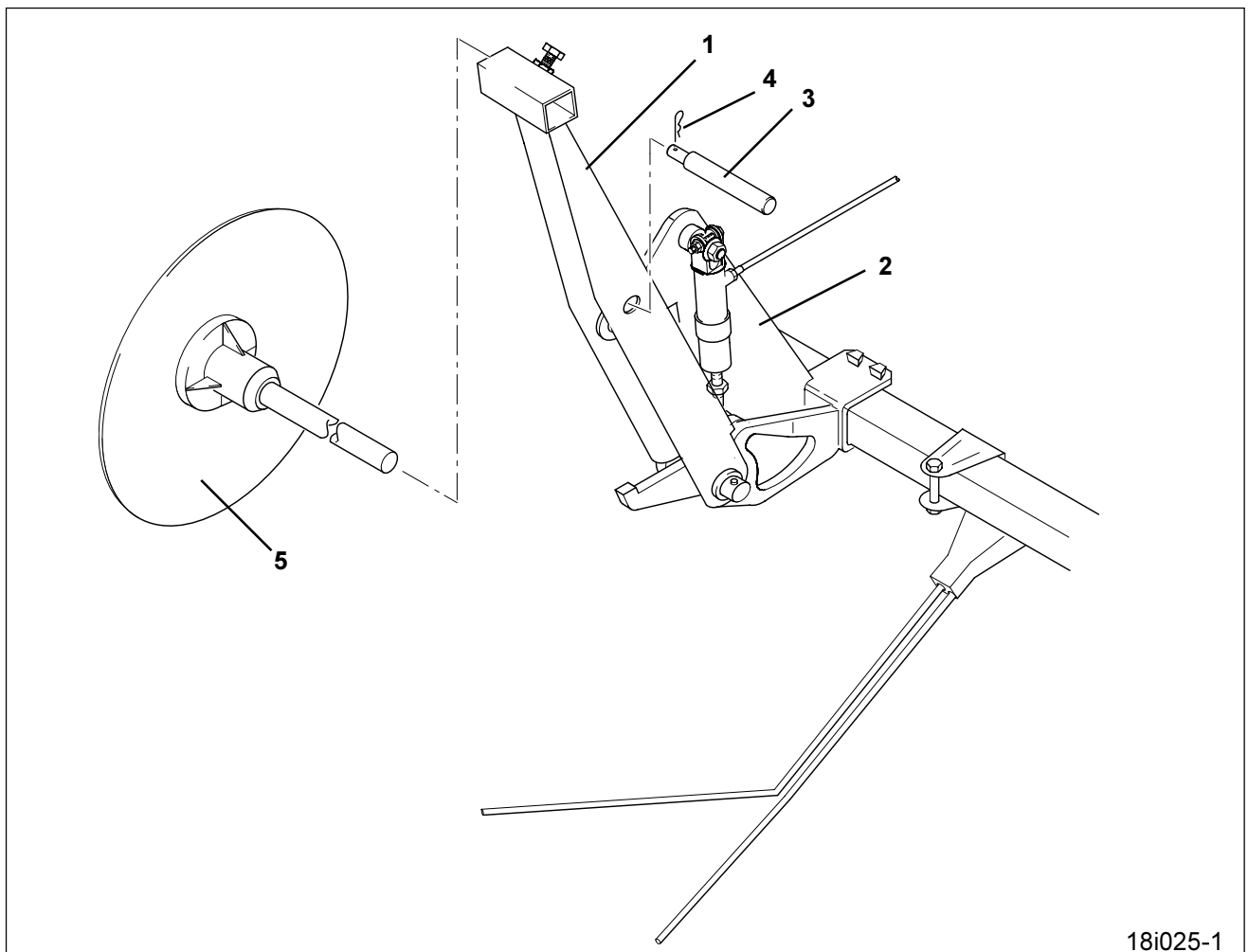


Fig. 19.7

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22.0 Rape insert (Special option)

The rape insert (Fig. 22.1/1) reduces the seed box capacity (Fig. 22.1/2). The seed can be almost completely metered out.

The rape insert may also be used for other free flowing seeds, e. g. for late turnip, which are sown in small quantities (with the agitator shaft switched off).



If the rape insert has been fitted to the seed box, the agitator shaft must not be connected with the drive. Otherwise rape insert and agitator shaft will be damaged!

22.1 Fitting the rape insert

- On the gearbox pull the clip pin (Fig. 22.2/1) out of the hole (Fig. 22.2/2) located on the gearbox tubular shaft and insert into the hole of the auxiliary shaft as illustrated. The drive of the agitator shaft is then disengaged.
- Bring the agitator fingers (Fig. 22.1/3) of the agitator shaft into vertical position.
- Please refer to the table (Fig. 22.4) for the lengths of the rape insert profiles and the number of clamps.
- Affix the rape insert profiles (Fig. 22.1/1) according to table Fig. 22.4 and the fitting drawing Fig. 22.5.
- The rape insert profiles (Fig. 22.1/1) rest on the agitator shaft (Fig. 22.1/3) and must additionally be affixed by clamps (Fig. 22.1/5).



After sowing rape and having removed the rape insert, re-connect the agitator shaft, otherwise, when sowing seed that is not free flowing the seed will block inside the seed box and irregular sowing will result. Slightly lift your seed drill and turn the drive wheel until the clip pin (Fig. 22.3/1) can be inserted into the gearbox tubular shaft as illustrated. Then the agitator shaft is connected to the drive.

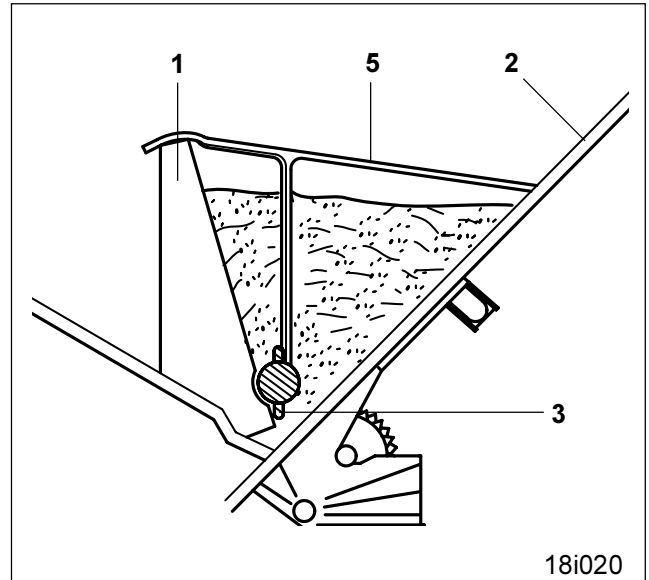


Fig. 22.1

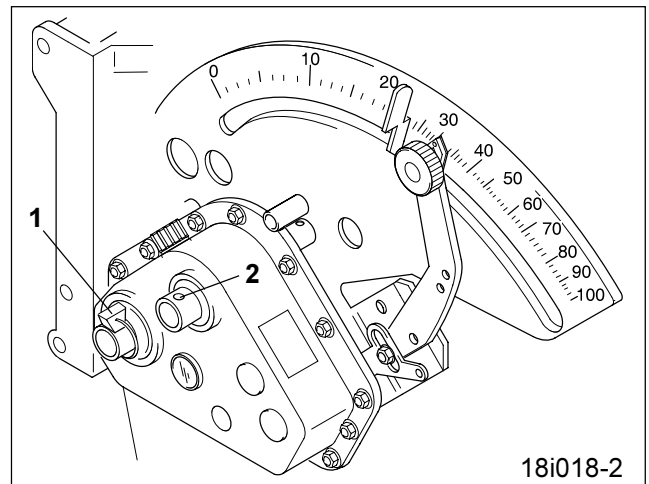


Fig. 22.2

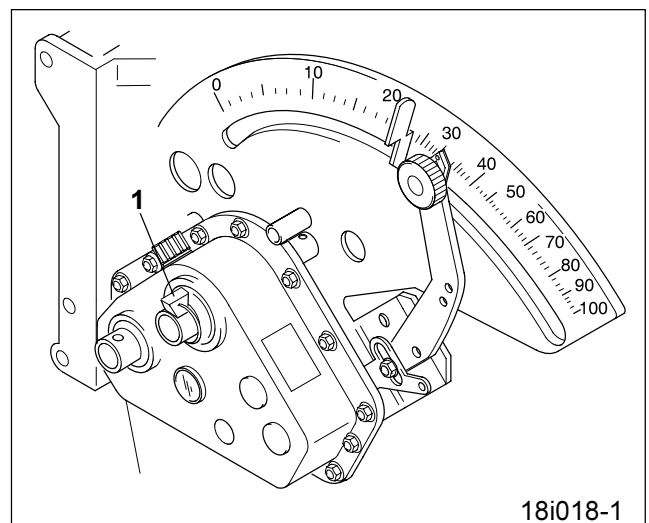


Fig. 22.3



Rape insert					
List of individual parts for assembly drawing					
Nr.	Working width				
	2,5 m	3,0 m	4,0 m	4,5 m	6,0 m*
1		Rape insert profile L = 1036 mm	Rape insert profile L = 1036 mm		
2		Rape insert profile L = 240 mm	Rape insert profile L = 740 mm		
3		Rape insert profile L = 1036 mm	Rape insert profile L = 1036 mm		
4		Rape insert profile L = 240 mm	Rape insert profile L = 740 mm		
5		Number of clamps: 8	Number of clamps: 10		

Fig. 22.4

*per one seed box
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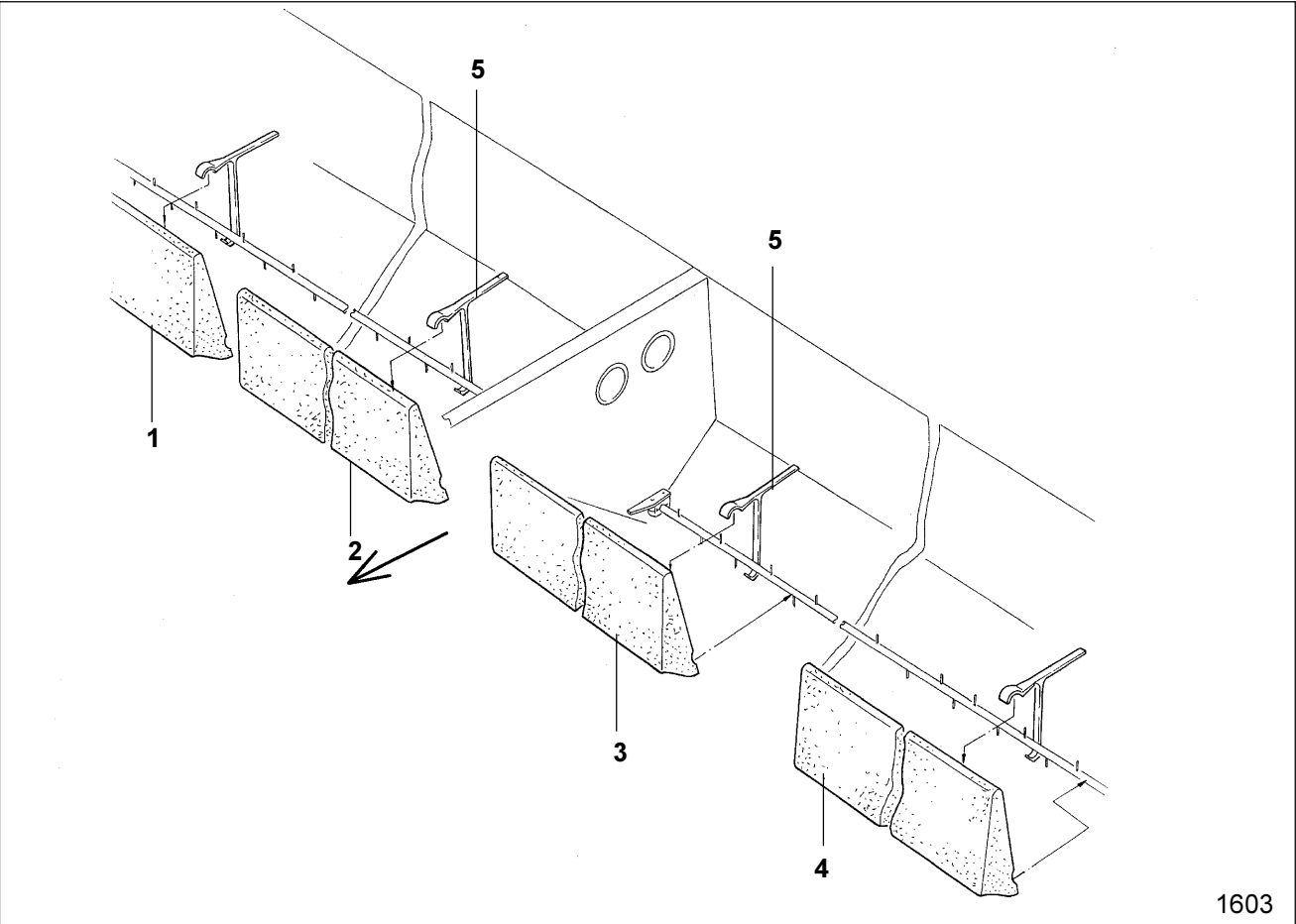


Fig. 22.5

1603

23.0 Tractor wheel mark eradicator (optional equipment)

The eradicators (Fig. 23.1) „plough“ the loose soil by the side of the tractor track (see Fig. 23.2) into the tractor track. This way, the best levelling of the tractor track is achieved and receives sufficient loose soil for seed germination. Damage of the eradicators from stones in the compacted track are avoided.



Lift the seed drill by using the tractor hydraulics before bringing the eradicator tines into operating position. To avoid damage on the eradicators only lower the seed drill after the eradicator tines have been slid upwards again!

23.1 Settings in the field before starting to operate

When supplied the four eradicators (Fig. 23.1) are attached to the main frame tube of your seed drill. Bring the eradicators into operating position only immediately prior commencing work in the field.

- Slightly lift the seed drill by using the tractor hydraulics.
- Slacken the hex. nuts (Fig. 23.1/2) and set the eradicators on the frame main tube to the correct position.

Affix the eradicators on the frame main tube in such a way that each two eradicator tines (see Fig. 23.2) work approx. 5 cm r. h. and l. h. by the side of the tractor track. **Do not fit** the eradicator tines as shown in Figure 23.3.

- Set the eradicator tines (Fig. 23.1/1) to the correct working depth.
- Tighten hex. nuts (Fig. 23.1/2).

To avoid damage the eradicators are provided with a stone safety device. The resilient eradicators give way when passing rigid obstacles..



When parking the seed drill ensure that the eradicator tines (Fig. 23.1/2) are swiveled to the rear to avoid damage to the eradicators.

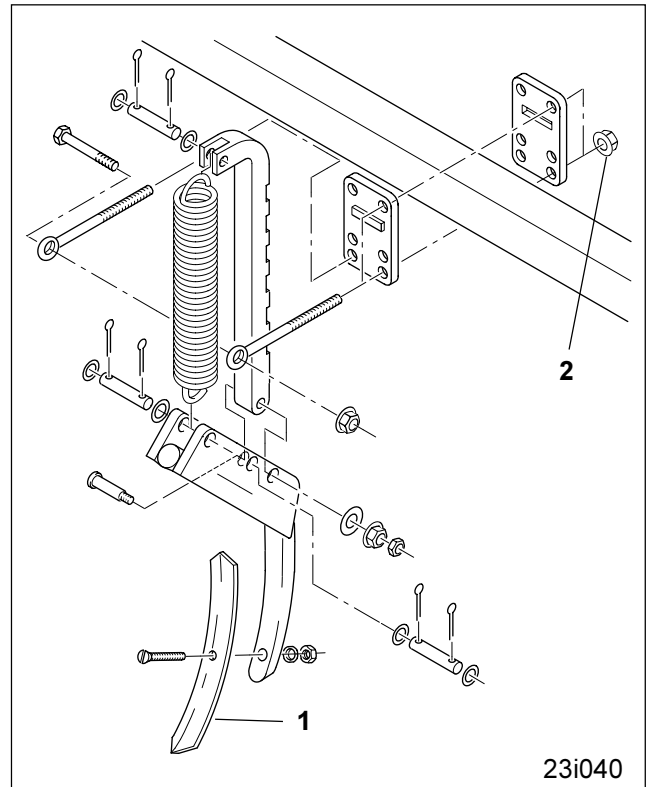


Fig. 23.1

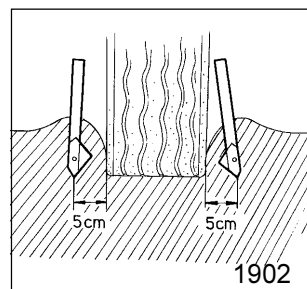


Fig. 23.2

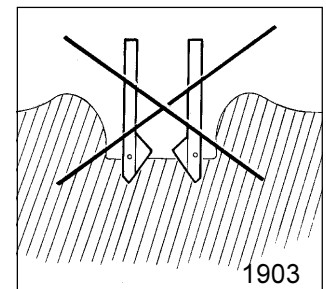


Fig. 23.3

24.0 Transport on public roads



The transport width of 3 m must not be exceeded. Therefore, the seed drill D9-60 SUPER may only be transported in longitudinal direction on the AMAZONE transport device TV. For a more detailed description, please refer to the TV-instruction manual.

26.0 Maintenance and repair



Observe the general safety and accident prevention advice when carrying out maintenance and repair!

26.1 Check bolted connections

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

26.2 Check tyre pressure

Check tyre pressure prior to any operation with your seed drill.

Tyres	Air pressure
6.00 - 16	1,2 bar
10.0/75-15	0,8 bar
11.5/80-15	0,8 bar
31x15.50-15 - MITAS -	0,8 bar

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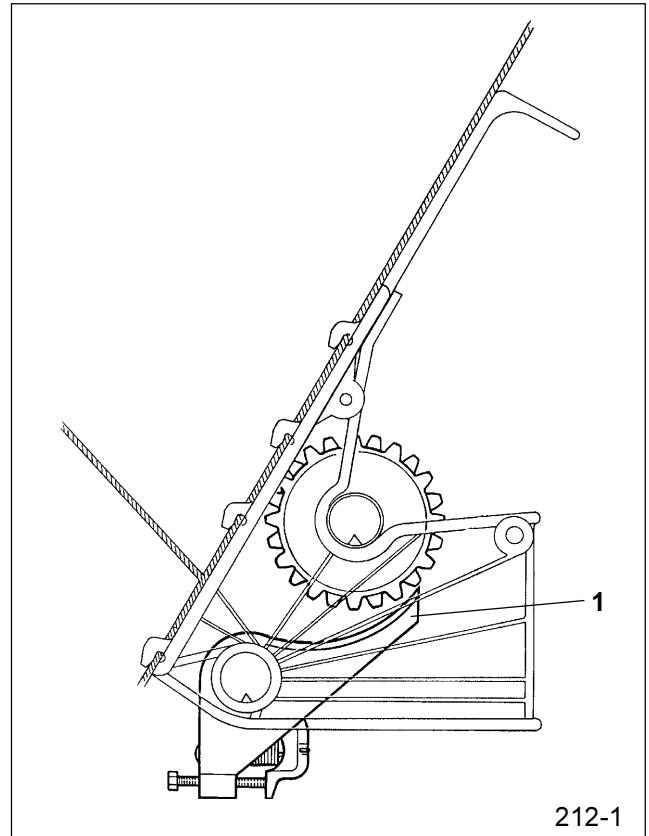


Fig. 26.1

26.3 Cleaning the seed drill

The seed drill 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



Leave the bottom flaps (Fig. 26.1/1) opened when you do not need your seed drill for a long periods of time. When the bottom flaps remain closed, especially in winter, the danger exists that mice try to get into the seed box in their search for grain even when the seed box is empty. When the bottom flaps are closed, the mice might nibble at the bottom flaps and seed metering wheels.

26.4 Setting the bottom flaps

Incorrectly set bottom flaps (Fig. 26.2/1) may lead to inaccurate seed flow (over application) during sowing operation. Therefore, check the bottom flaps every six months or before every sowing season. This must be carried out with an empty seed box and empty seed housings.

1. Empty the seed box.
2. Bring bottom flap setting lever (Fig. 26.2/2) at the setting plate into position "1" of the quadrant plate and secure.
3. Check bottom flaps (Fig. 26.3/1) for easy operation.
4. Check whether the prescribed spacing of 0.1 mm to 0.5 mm (see Fig. 26.3) between the bottom flap (Fig. 26.3/1) and metering wheel (Fig. 26.3/2) of each metering wheel housing is maintained. For this, the metering wheel to be checked should be turned by hand on the seed shaft.
5. In case of deviations set the prescribed spacing at the spring tensioning screw (Fig. 26.3/3).

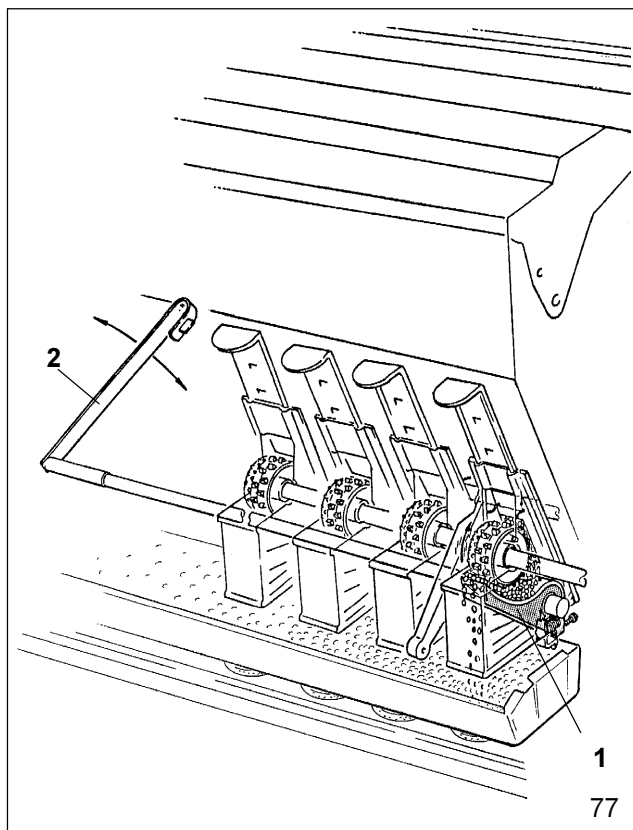


Fig. 26.2

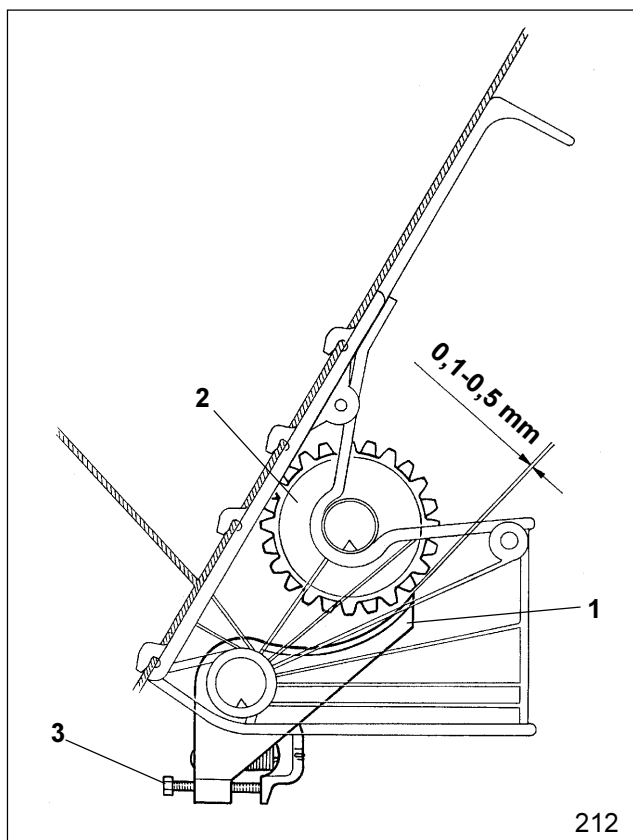


Fig. 26.3

26.5 Checking the oil level inside the vario gearbox

Check the oil level inside the vario gearbox at the oil gauge window (Fig. 26.4/1) on the seed drill horizontally. It is not necessary to change the gearbox oil.

For refilling oil unbolt the seal cap (Fig. 26.4/2):

Filling quantity: 0,9 litres

Only use the following grades of oil:

Hydraulic oil WTL 16,5 CST/50°C

or

engine oil SAE 10W.

26.6 Checking the drive chain

The sowing units of the seed drill are driven by a roller chain (Fig. 26.4/3). The roller chain between axle and vario gear drive is automatically tensioned by a chain tensioner (Fig. 26.4/4).

At the end of the season before storage, or before longer spells of inactivity, apply oil to the roller chain. Remove chain guard (Fig. 26.4/5), lubricate the chain, remount the guarding.

26.7 Grease nipples

Regularly grease all bearings. To prevent dirt from entering the bearing, clean the grease gun and the grease nipples carefully before greasing. All dirty grease must be forced out of the bearings and replaced by new grease.

Grease the following parts after every 50 hours of operation:

- the 4 grease nipples on the axle bearings (Fig. 26.5/1)

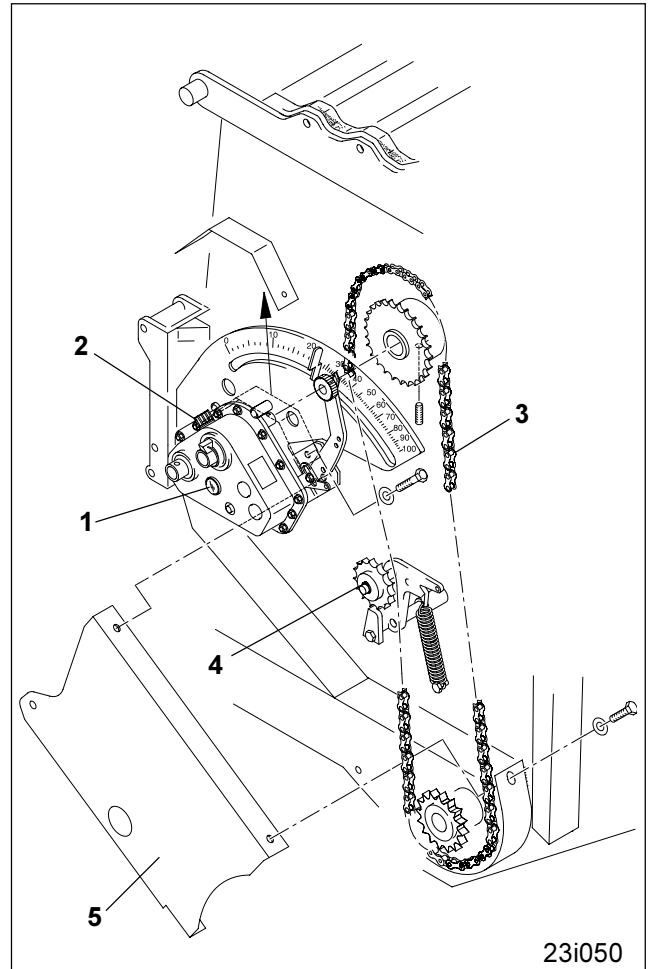


Fig. 26.4



Fig. 26.5

26.8 Exchanging the coultar point of the Suffolk (WS) coultar

Worn coultar points (Fig. 26.6/1) on Suffolk-coultars can be exchanged. It is not necessary to remove the coultar support (Fig. 26.6/2). However, pull the funnel (Fig. 26.6/3) out of the coultar unit. To do this, press two naps (Fig. 26.6/4) of the funnel into the coultar unit. When fitting ensure that the tabs catch into the location slots (Fig. 26.6/5).

Remove the counter sunk hexagon headed screw with an Alan key (Fig. 26.6/6), remove the coultar point (Fig. 26.6/1) from its bracing and affix the new coultar point in reverse order.

26.9 Hydraulic hoses

26.9.1 Checking when starting and during operation

When starting and during operation the ordinary condition of the hoses should be checked by a skilled person.

If the hoses are found to be defective in any way, change 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 leakages
- 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.

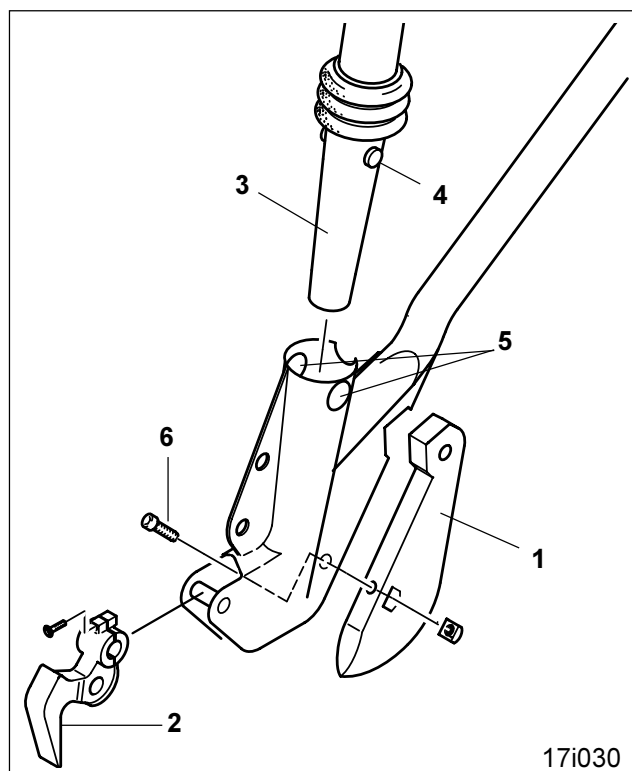


Fig. 26.6

26.9.2 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).

26.9.3 Marking

Hydraulic hoses are marked as follows:

- name of the manufacturer
- date of production
- maximum dynamic operational pressure.

26.9.4 Please observe when fitting and removing



Before working on the hydraulics read chapter 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.



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