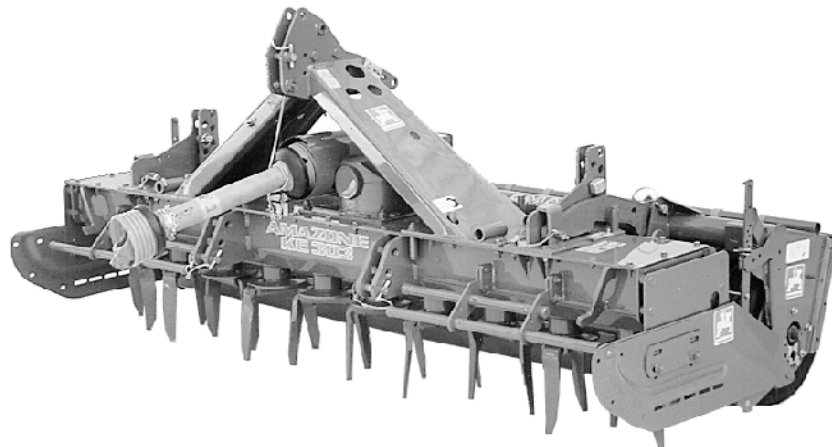




## Instruction Manual

### Rotary Harrows KE 3 Rotary Cultivators KG 2



MG 515  
B 144-1 GB 03.99  
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

All rights reserved



AMAZONE rotary harrows KE and rotary cultivators KG are yet other high quality products from the large range of AMAZONE farm machinery.

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

Please ensure that this instruction manual has been made available to the operator before starting to operate the implement.

This instruction manual refers to:

AMAZONE-rotary harrows KE 3,  
AMAZONE-rotary cultivators KG 2

- with tooth packer rollers PW
- with tyre packer rollers RP
- with wedge ring rollers KW and
- with support rollers SW.

AMAZONEN-Werke  
H. Dreyer GmbH & Co. KG

#### **Hints for this instruction manual**

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

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



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## 2.0 Details about the machine

### 2.1 Operational range

In combination with an AMAZONE culti packer roller, the AMAZONE rotary harrows KE and AMAZONE rotary cultivators KG are suited for the usual soil tillage operation in agriculture.

### 2.2 Manufacturer

#### **AMAZONEN-Werke**

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

### 2.3 Conformity declaration

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

## 2.4 Details when making enquiries and ordering

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

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

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



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

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

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



## **2.5 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.

Claims regarding damage not having occurred on the AMAZONE soil tillage implement would be rejected. Modifications made to the soil tillage implement by the owner/user may result in damage and therefore the manufacturer does not accept liability for such damage.

## **2.6 Declined use of the implement**

The AMAZONE-rotary harrows KE and AMAZONE-rotary cultivators KG have exclusively been designed for the usual soil tillage operation in agriculture.

Any use beyond the one stipulated above is no longer considered as designed use. The manufacturer does not accept any responsibility for damage resulting from this; therefore, the operator himself carries the full risk. Under "designed use" also the adhering to the manufacturer's prescribed operation maintenance and repair conditions as well as the exclusive use of original AMAZONE-spare parts is to be understood.



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



**Therefore, check before any use and also during operation your implement for the proper function.**



## 2.7 Type plate

The type plate (Fig. 2.1) is of documentary value and may not be changed or disguised!

Insert here the machine type and serial number.  
of your soil tillage implement.

Machine type:

AMAZONE  
Rotary harrow KE .....

AMAZONE  
Rotary cultivator KG .....

Serial-No.: .....

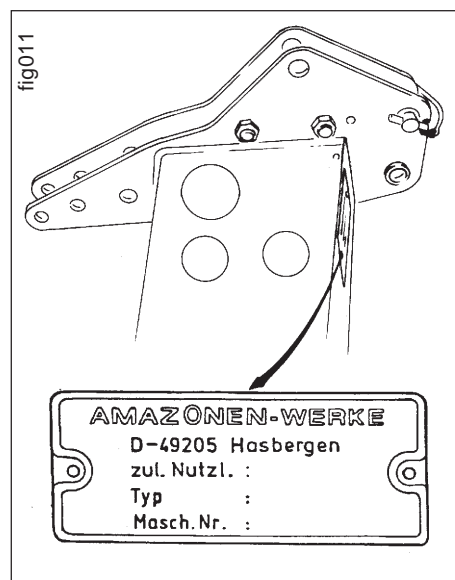


Fig. 2.1



## 2.8 Technical data

### Rotary harrows

| AMAZONE-Rotary harrows  | KE 253<br>(see Fig. 2.2) | KE 303<br>(see Fig. 2.3) | KE 403<br>(see Fig. 2.4) |
|---|--------------------------|--------------------------|--------------------------|
| working width   | 2,5 m                    | 3,0 m                    | 4,0 m                    |
| number of tools   | 8                        | 10                       | 14                       |
| length of tines   | 29 cm                    | 29 cm                    | 29 cm                    |
| max. working depth  | 20 cm                    | 20 cm                    | 20 cm                    |
| net weight of rotary harrow<br>without packer roller                            | 740 kg                   | 920 kg                   | 1280 kg                  |
| net weight of rotary harrow<br>with tooth packer roller PW 500                  | 1120 kg                  | 1370 kg                  | 1850 kg                  |
| net weight of rotary harrow<br>with tyre packer-<br>Pack-Top seed drill RP-AD 2 | > 1470 kg                | > 1775 kg                | > 2480 kg                |

t144gb01

### 2.9 Possibilities of use of the rotary harrow

The AMAZONE-rotary harrow can be used

- **as an individual machine** in conjunction with a tooth packer-, tyre packer, wedge ring- or support roller (support rollers up to a working width of 3 m)
- **as part of a till- and drill combination** with tooth packer-, tyre packer- or support roller (support rollers up to 3 m working width) and hitched seed drill
- **as part of a till- and drill combination** with tooth packer-, tyre packer- or wedge ring roller and a pack top seed drill.

### 2.10 Range of application of the rotary harrow

The AMAZONE-rotary harrow can be used for

- **Soil tilling or.  
seed bed preparation**  
after ploughing, usage of a rotary cultivator or a deep cultivator or as
- **Soil tilling or.  
seed bed preparation**  
without preparatory work on light soil.

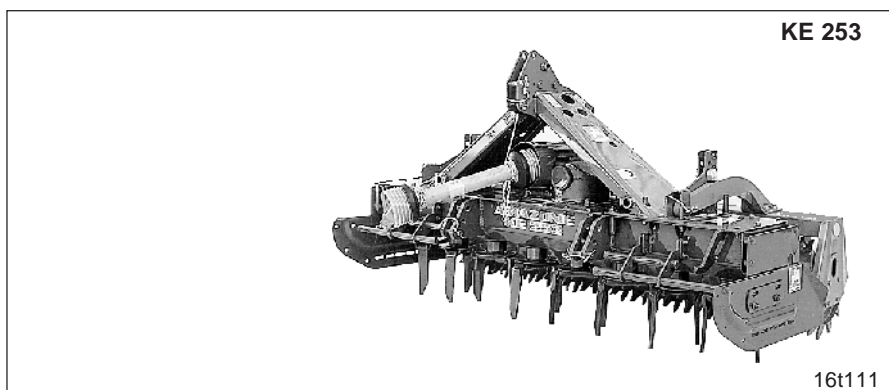


Fig. 2.2

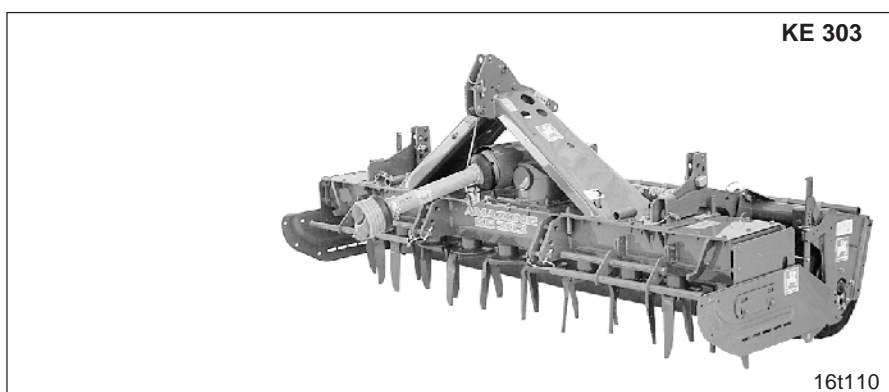


Fig. 2.3

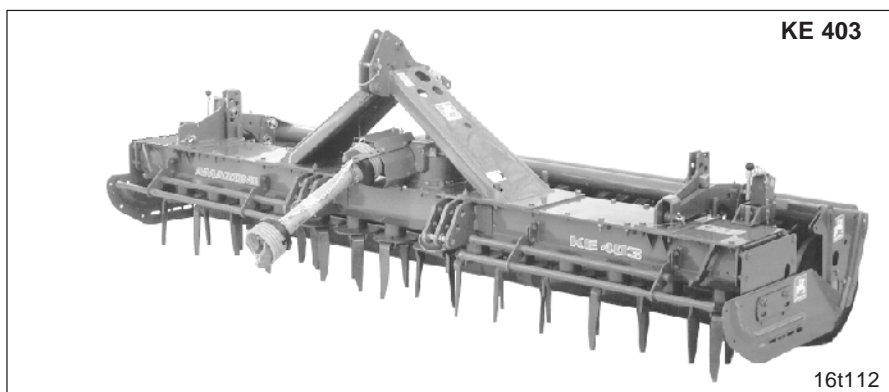


Fig. 2.4



## 2.11 Technical data

### Rotary cultivator

| AMAZONE-Rotary Cultivator  | KG 252       | KG 302<br>(Fig.2.5) | KG 402<br>(Fig. 2.6) | KG 452<br>(Fig. 2.7) | KG 602<br>(Fig. 2.8) |
|--|--------------|---------------------|----------------------|----------------------|----------------------|
| working width  | 2,5 m        | 3,0 m               | 4,0 m                | 4,5 m                | 6,0 m                |
| number of rotors   | 8            | 10                  | 14                   | 16                   | 20                   |
| length of tines  | 29 cm        | 29 cm               | 29 cm                | 29 cm                | 29 cm                |
| max. working depth   | 20 cm        | 20 cm               | 20 cm                | 20 cm                | 20 cm                |
| net weight rotary cultivator<br>without packer roller                                      | 804 kg       | 1000 kg             | 1400 kg              | 1570 kg              | 2065 kg              |
| net weight of rotary cultivator<br>with tooth packer roller PW 500                         | 1185 kg      | 1450 kg             | 1970 kg              | 2210 kg              | 2985 kg              |
| net weight of rotary cultivator<br>with tyre packer roller-<br>Pack Top seed drill RP-AD 2 | ><br>1582 kg | ><br>1910 kg        | ><br>2660 kg         | ><br>3000 kg         | ><br>3920 kg         |

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## 2.12 Possibilities of use

### of the rotary cultivator

The AMAZONE-rotary cultivator can be used

- **as an individual machine** in conjunction with a tooth packer-, tyre packer, wedge ring- or support roller (support rollers up to a working width of 3 m)
- **as part of a till- and drill combination** with tooth packer-, tyre packer- or support roller (support rollers up to 3 m working width) and hitched seed drill
- **as an individual machine** in conjunction with a tooth packer-, tyre packer, wedge ring- or support roller (support rollers up to a working width of 3 m)
- **as part of a till- and drill combination** with tooth packer-, tyre packer- or support roller (support rollers up to 3 m working width) and hitched seed drill.

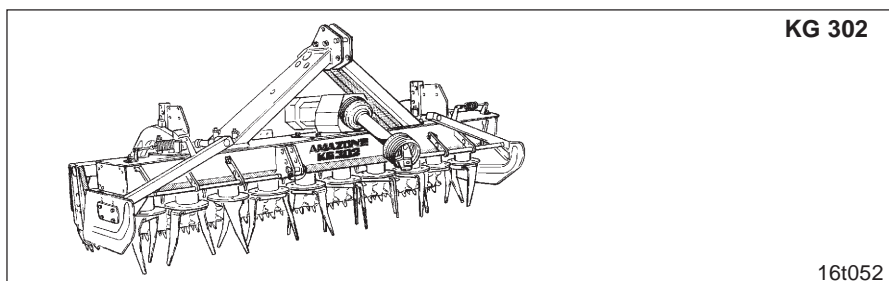
The till- and drill combination optimises the loosening of the soil, recompacting and precise seeding in one pass.

## 2.13 Areas of application

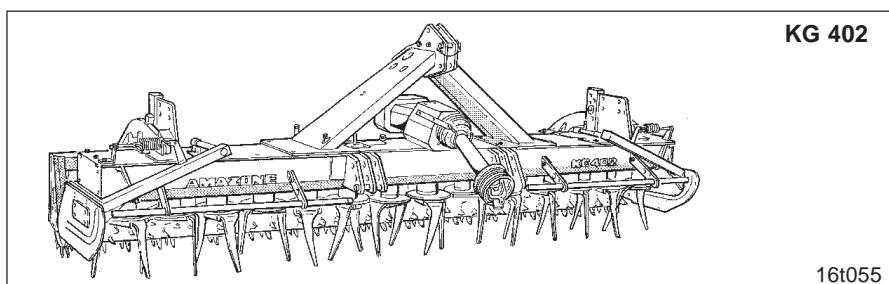
### of the rotary cultivator

The AMAZONE-rotary cultivator can be used for

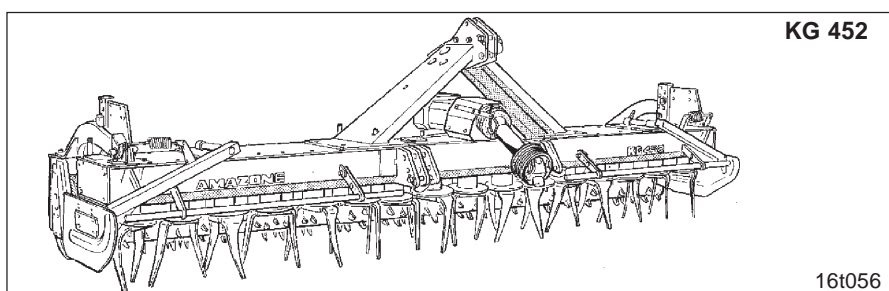
- **Seed bed preparation**  
after ploughing, use of a heavy cultivator or a deep cultivator
- **Seed bed preparation**  
without prior work
- **stubble tilling**  
without prior work
- **pasture tilling** without prior work.



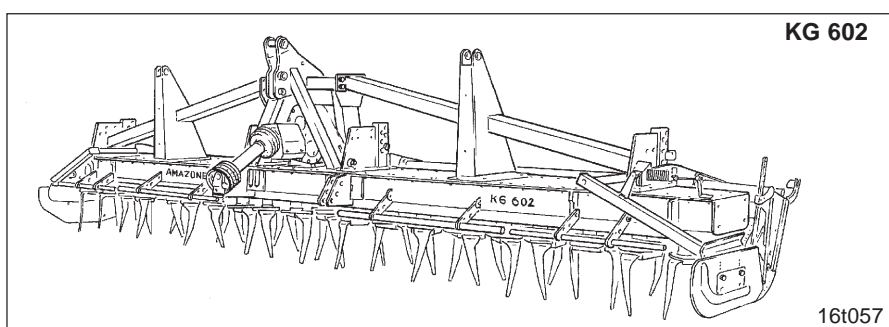
**Fig. 2.5**



**Fig. 2.6**



**Fig. 2.7**



**Fig. 2.8**



### 2.14 Working principle of the rotary harrow and the rotary cultivator

The tines

- of the rotary harrow are in "dragging" position.
- of the rotary cultivator are in the "grip" position.

The tines "on grip" of the rotary cultivator rip up and crumble the soil. Tines "on grip" pull the rotary cultivator into the soil. Thus, the rotary cultivator, supported by the packer roller, maintains a constant working depth, irrespective whether the soil has been ploughed or not tilled at all.

Good packing of the soil tillage implement and the packer roller results from three factors:

1. net weight of the packer roller (Fig. 2.9/1).
2. net weight of the soil tillage implement (Fig. 2.9/2).

For the rotary cultivator you have to add

- the force with which the tines try to drag themselves into the soil (Fig. 2.9/3).

Tines in the "grip" position have a separation effect: coarse soil particles are transported further than fine particles. The fine soil is concentrated in the lower region of the worked zone while the coarse soil particles remain on the surface (see Fig. 2.10), protecting against panning of the soil.

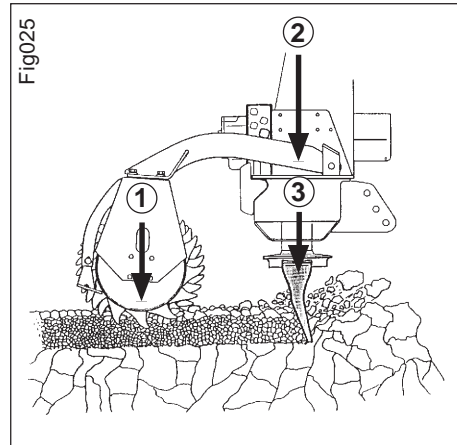


Fig. 2.9

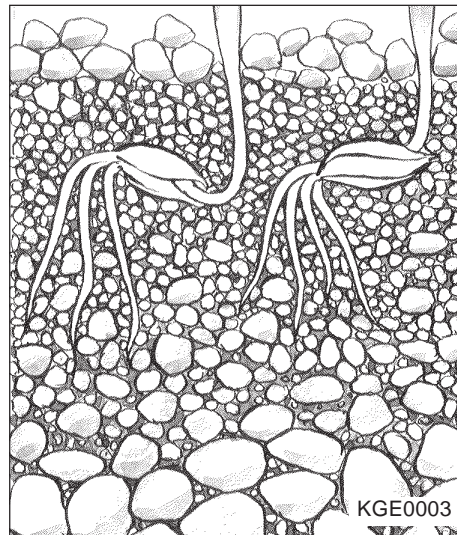
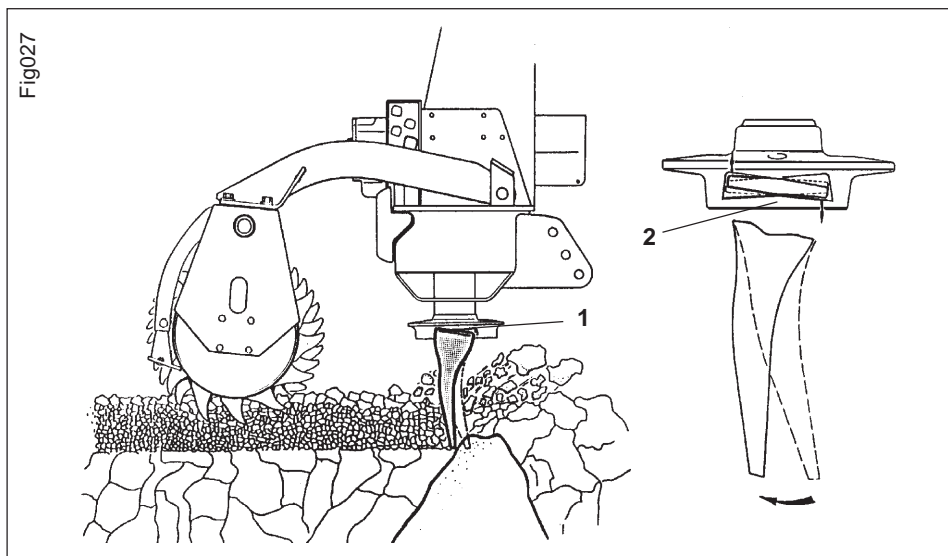


Fig. 2.10



**Fig. 2.11**

A wall of soil is thrown up in front of the rotary cultivator (Fig. 2.11/1) which fills in unevennesses.

Straw and other organic matter are mulched near the surface.

The round tine carriers (Fig. 2.11/1) prevent stones from being trapped. The tines are fastened in pockets (Fig. 2.11/2) that are shaped in such a manner that the tines can give way to stones and other obstacles.

The tines, manufactured from hardened spring steel, ensure that the soil tillage implement runs quietly.

The long tines allow a large clearance height when incorporating straw.



### 2.15 Observe when loading for transport

Use a hoist for loading the soil tillage implement without packer/packer as shown in Fig. 2.12.

For loading the soil tillage implement with packer roller use a hoist as shown in Fig. 2.13.

When receiving your implement, check that no damage has been caused in transit and all parts are present. Only the immediate claim towards the forwarder will lead to compensation. Please check whether all parts mentioned in the delivery note are present.

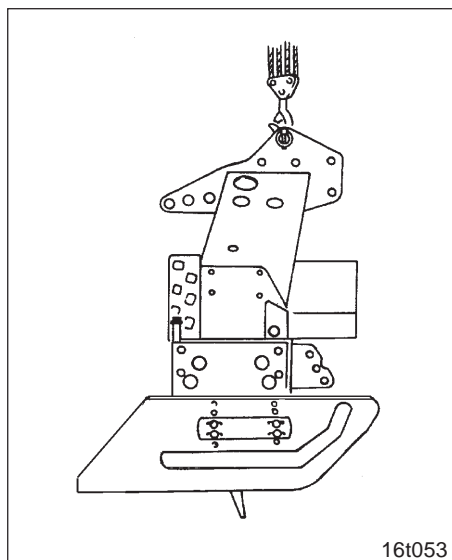


Fig. 2.12

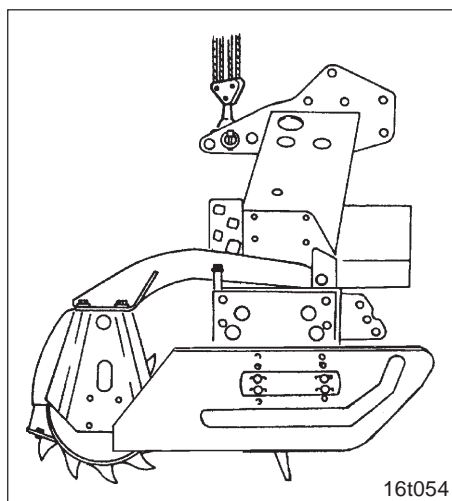


Fig. 2.13



### 3.0 Safety

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

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

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

The descriptions are supplemented by many pictures in order to explain to you all functions and to give you hints for the safety and for the operation of the implement under different operation conditions.

Please always follow and adhere to all safety advice exactly.

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

Not adhering to the safety advice

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

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

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

### 3.2 Operator qualification

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

### 3.3 Symbols in this instruction manual

In this instruction manual many warnings, caution-hints and hints have been signed by symbols. The explanation of these symbols are given in the following:



#### General working safety symbol

(DIN 4844-W9)

This symbol draws your attention to information given in this instruction manual regarding danger to the life of persons..



#### Attention symbol

gives safety hints. Not adhering to these hints may cause danger for the machine and its function.



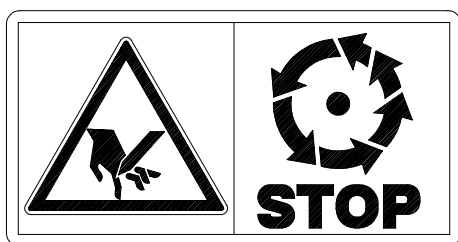
#### Hint symbol

indicates machine specific special information that must be observed for proper operation.



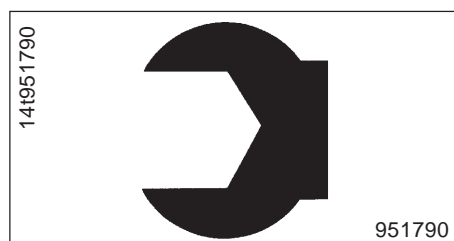
### 3.4 Warning signs and hint signs on the machine

The warning signs, e. g.:



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

The hint signs, e.g.:



indicate machine specific special information that must be observed for proper operation.



The fixing points of attention signs and hint signs are illustrated in the Figure 3.1. Please find the explanations for these attention- and hint signs on the following pages. We ask you to observe them and also make other users acquainted with them.

Please always keep all attention and hint signs clean and in well readable condition. Please ask for replacement of damaged or missing signs from your dealer and attach to relevant place (picture-No.: = order-No.).

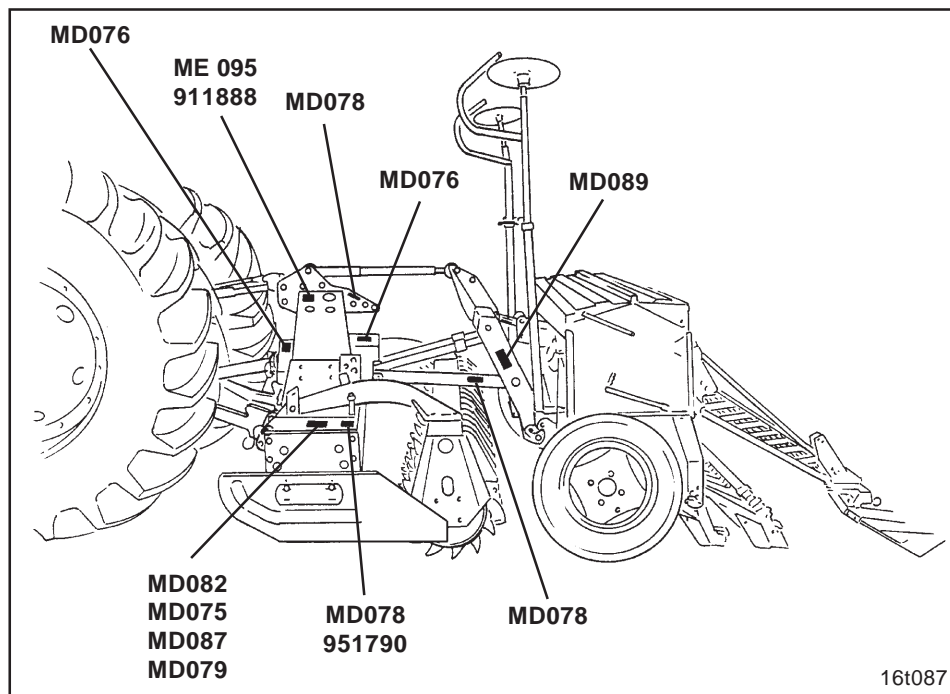
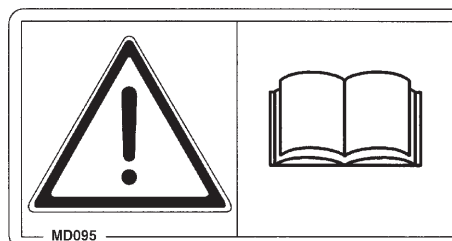


Fig. 3.1

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

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

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

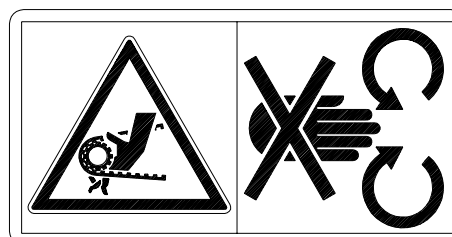
Do not touch any moving machine parts. Wait for their standstill!

**Picture-No.: MD 076****Explanation:**

Only start to operate with the implement with guards fitted.

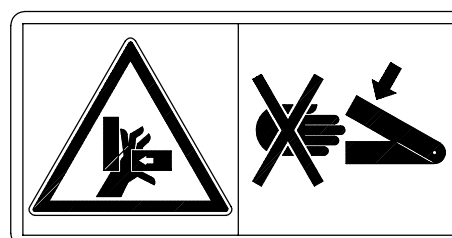
Do not remove guards when the engine is running.

Switch off the pto shaft before removing the guard. Stop engine and pull off ignition key!

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

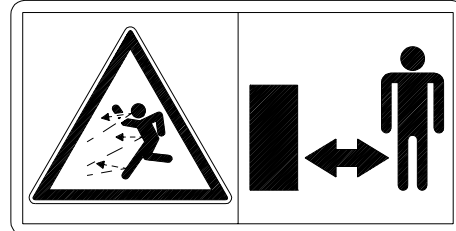
Never touch zone of bruizing danger as long as parts can still be moving.

Advise people to leave the danger area!



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

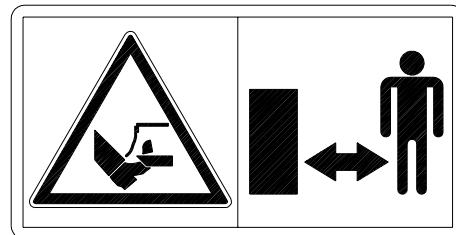
Danger because of flinging foreign particles!  
Advise people to leave the danger area!

Picture No.: **MD 082****Explanation:**

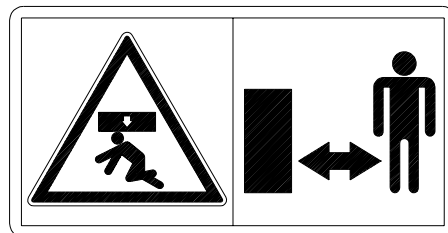
Sitting or standing on the implement during operation or road transport is not permitted!

Picture No.: **MD 087****Explanation:**

Observe sufficient safety zone from rotating tines when engine is running with pto shaft engaged.

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

Do not stay within the area of a lifted and unsecured load!

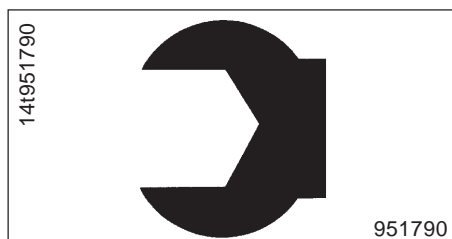




Picture No.: **951790**

**Explanation**

Retighten bolts after some hours of operation!



Picture No.: **911888**

**Explanation**

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







### 3.5 Safety conscious operation

Beside the safety advice in this operation manual your national common working safety and accident prevention advice have to be adhered to.

For road transport observe your national applicable traffic rules.

### 3.6 Operator safety advice for the operator

#### 3.6.1 General safety and accident prevention advice

##### Basic principle:

Before using the machine and tractor, always check to ensure that they are safe and comply with traffic regulations!

1. Apart from the notes in these operation instructions, also observe the general regulations regarding safety and accident prevention!
2. The warning and information labels attached to the machine provide important information for safe operation. They are intended to ensure your safety!
3. Observe the appropriate regulations when taking the machine onto public roads!
4. Become acquainted with all installations and controlling devices as well as with their function before beginning with the operation. Doing this during operation would be too late!
5. The clothing of the operator should fit well. Avoid wearing any loose clothing!
6. Keep the implement clean to avoid the risk of fire!
7. Before starting or driving the implement, ensure that there are no persons in the immediate vicinity (especially children). Ensure that you have sufficient visibility!
8. No persons other than the operator may ride on the machine during work; the machine may not be used to transport goods or people!
9. Couple the machine in accordance with regulations and only secure it to the prescribed device.!
10. Particular attention must be paid when coupling and uncoupling the machine to and from the tractor!
11. When assembling and disassembling, ensure that the support devices are positioned correctly (stability).
12. Fit counter-weights always as advised to the fixing points provided for that purpose on the tractor!
13. Adhere to the maximum permissible axle loads, total weights and transport measurements!
14. Observe the national traffic regulations with regard to transport dimensions!
15. Fit and check transport gear, traffic lights, warnings and guards!
16. The release ropes for quick coupler must hang freely and in the lowered position must not release by themselves!
17. During driving, never leave the driver's seat!
18. Traveling behaviour, steerability and braking effectiveness are influenced by integrated and attached devices and ballast weights. Therefore, ensure that the machine has adequate steering and braking effectiveness!
19. When lifting the implement with the rear hydraulics the front axle load of the tractor is reduced. The sufficient front axle load (20 % of the tractor's net weight) has to be observed. (Please adhere to the instruction manual of the tractor's manufacturer.)
20. When driving on curves, take the width



and/or the balance weight of the machine into account

21. Only put machine to operation with all guards fitted properly!
22. Never stand in the operating area of the machine. Before starting the rotors, ensure that there are no persons in the danger zone of the rotors. Maintain a safety distance. Do not stand in the vicinity of the turning rotors.!
23. Loading of the machine is only permitted with stopped engine, removed ignition key and applied parking brake.
23. Do not stand in the turning and swivelling clearance area of the machine!
25. Hydraulic folding frames may only be actuated when no one is standing within the swivel area.
26. To avoid injury, keep clear of all parts actuated by external power (e. g. hydraulically).
27. Before leaving the tractor lower the machine to the ground. Stop engine and remove ignition key!
28. No persons must stand between the tractor and the implement unless the handbrake and/or chocks have been applied to prevent the vehicle from rolling. The engine has to be stopped and the ignition key removed.

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

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



### 3.6.3 General safety and accident preventive advice for pto shaft drive

1. Only use pto shafts recommended by the manufacturer!
2. Guard tubes and cones of the pto shaft as well as a tractor- and implement pto guard must be fitted and kept in the correct place!
3. Note the prescribed pto-shaft tube guards in transport- and operating position!
4. Mounting and dismounting pto shaft only with disengaged pto shaft, stopped motor and removed ignition key!
5. Always care for correct fitting and securing of the pto shaft!
6. Prevent pto guard from spinning by fixing the provided chains.!
7. Before engaging the pto shaft ensure that the chosen pto-speed of the tractor corresponds to the allowable implement input speed.!
8. When using the ground speed related pto shaft note that the speed is related to the forward speed and that the sense of rotation reverses when backing up!
9. Before switching on the pto shaft nobody is allowed to stay in the area of the spinning pto-shaft!
10. Never switch on the pto shaft while the engine is stopped!
11. When operating with the pto shaft nobody is allowed to stay in the area of the spinning pto- or universal joint shaft!
12. Always switch off pto shaft when it is in an adverse position or not needed!
13. Attention! After switching off the pto shaft the mounted implement may still continue to run by its dynamic masses! During this period never come too close to the implement. Begin work only after the implement has come to a full standstill!
14. Clean and grease the universal joint shaft and the pto-driven implement only after the pto shaft and engine have been stopped and the ignition key removed!
15. Deposit removed pto shaft on the provided carrier!
16. After removal of the pto shaft replace protective cap over the tractor's pto! Never remove the pto shaft cap from machine and tractor!
17. Remedy of damage is to be undertaken before starting to operate with the implement!



#### **3.6.4 General safety and accident preventive advice when making use of a hydraulic system**

1. The hydraulic system is under high pressure!
2. When connecting hydraulic rams and engines the prescribed connection of the hydraulic hoses has to be noted!
3. When connecting the hydraulic hoses to the tractor's hydraulic take care that the hydraulic is pressureless as well on the tractor- as on the implement side!
4. At hydraulic function connections between tractor and implement, the sockets and plugs should be colour coded in order to avoid misoperation.

When mixing up connection, danger of reverse function, e. g. lifting instead of lowering. Danger of accident!

5. Regularly check hydraulic hoses and exchange in case of damages or aging. The replacement hoses have to correspond to the technical demands of the implement manufacturer!
6. When searching for leaks appropriate aids should be used due to danger of injury!
7. Liquids (hydraulic oil) penetrating under high pressure may penetrate the skin and cause severe injuries.

In case of injuries immediately see a doctor. Danger of infection!

8. Before starting to do any repair work on the hydraulic system, lower implement, relieve system from pressure and switch off the engine!
9. The period of use of any hose circuit should not exceed six years including a possible storing period of two years in maximum. Also when stored and used properly, hoses and hose circuits age. Therefore, their longevity and period of use is limited. Deviations from the above

may be accepted depending on the experience made and the danger potential. For hoses and hose circuits made of thermoplasts other guide lines may prevail.



### **3.6.5 General safety and accident preventive advice for maintenance, repair and cleaning**

1. Repair, maintenance- and cleaning operations as well as remedy of function faults should principally be conducted with a stopped drive and engine. Remove ignition key!
2. Check nuts and bolts regularly for tightness and retighten if necessary!
3. When doing maintenance work on the lifted implement make sure that it is secured by proper supports!
4. When changing operating tools with cutting edges use appropriate tools and wear gloves!
5. Dispose of oil, grease and filters in the wappropriate 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 must, in minimum 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 preventive advice when retrofitting electrical and electronical devices and/or components**

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

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

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





#### 4.0 Putting to operation

Carefully read and adhere to the instruction book and safety advice before putting your seed drill to operation!

Acquaint yourself with the correct handling and with the operating devices. Never allow the machine being operated by unacquainted personnel.

Maintain your machine in a good operational order. Changes to the machine not allowed by the manufacturer may endanger the functionality and/or safety and may reduce the life span of the machine. Claims will be rejected in case of operational mistakes.

Liability claims can only be accepted if exclusively original spare parts and wearing parts are used for replacement.

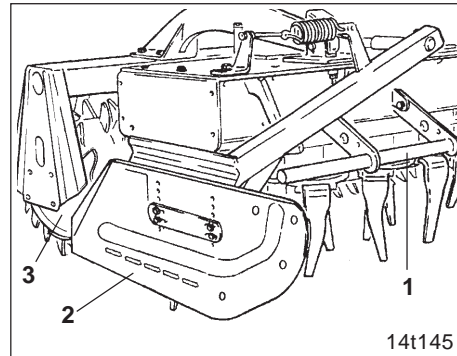


Fig. 4.1



1. The implement may only be used with the tool guard tubes (Fig. 4.1/1), side plates (Fig. 4.1/2) and a roller (Fig. 4.1/3) fitted!
2. Never stay or allow anyone to stay within the operating area!
3. Sitting or standing on the implement during operation or during transport is not permissible!
4. Danger by flinging foreign particles! Do not allow persons to stay in the danger area!
5. Never leave the operator's seat during driving!
6. After switching off the pto shaft, danger by gyrating masses. Do not come too near to the implement during this period. Only when the rotors have come to a full standstill and the ignition key has been removed, operations may be executed on the soil tillage implement!
7. Immediately repair any damages before operating again with the



## implement!

### 4.1 Initial assembly

- Pto-shaft (option) according to para. 6.2 to para. 6.5.
- Cultipacker roller (option) according to para. 7.0.
- Side plates according to para. 10.1 and para. 10.2
- Coupling parts (option) for Pack Top seed drills according to para. 12.0.
- AMAZONE system "Liftpack" (option) according to para. 13.0.
- Levelling rod (option) according to para. 14.3.
- Tractor wheel mark eradicators (option) according to para. 15.3.

### 4.2 Settings in the field

1. Set the speed of the tines. Data concerning tine speeds and their adaptation to the soil conditions may be found in para. 9.0.
2. Check working depth of the soil tillage implement and adjust if necessary (please refer to para. 7.3).
3. Adjust working depth and spring tensioning of the side plates according to para. 10.1 and para. 10.3.
4. Bring levelling board into working position (please refer to para. 15.1).
5. Bring tractor track eradicators into working position (please refer to para. 15.1).

### 4.3 Beginning operation

1. Immediately before using the rotary cultivator in the field, it is to be lowered using the tractor's hydraulic system until the rotary cultivator's tines are just over the soil but do not touch it. The tractor's pto shaft is to be brought to the preset speed. While the tractor commences driving, the rotary cultivator is to be lowered entirely.



**1. For tractors with hydraulically or pneumatically switchable pto shafts, the pto shaft must only be engaged in neutral gear to prevent damaging the universal joint shaft.**

2. **If the cultipacker roller turns with difficulty during the first use due to, e.g. sticking paint, do not immediately adjust the scraper. Instead, simply pull the roller over firm ground (untilled soil), until the roller turns easily.**

### 4.4 During operation



**When turning or lifting the rotary cultivator on headlands, it is to be lifted so far that the tines of the rotary cultivator and the packer roller are just above the soil. If the universal joint shaft is only slightly angled, the universal joint shaft can continue to run. If the rotary cultivator runs noisily when it is raised, the tractor's pto shaft is to be switched off.**



**Pay attention to the minimum length of the tines (see para. 19.5). When working at great depth, the**





tines are to be replaced before they reach the minimum length. Rotary cultivator tines can also be brought to their original length by weld-on tine tips.



As the wear of the tines increases, the setting of the rotary cultivator's working depth is to be corrected (see para. 7.3) and the side plates are to be adapted to the new working depth.



The tines or the rotors can come to a standstill in stony soil or when a firm obstacle is encountered. To prevent gear damage, the universal joint shafts lateral to driving direction are equipped with an overload clutch. If the rotors come to a standstill, observe para. 6.5.

#### **4.5 After the first 10 operating hours**



All bolt connections are to be checked and, if necessary, retightened after the first 10 operating hours.

#### **4.6 After having finished work**

Before uncoupling the rotary cultivator off the tractor

- set tractor mark eradicator according to para. 15.2
- fasten the universal joint shaft according to para. 6.7.





## 5.0 Mounting to the tractor



**Adhere to the safety regulations according to para. 3.6.2 when mounting the soil tillage implement to the tractor.**

Mount the soil tillage implement to the rear three-point linkage of the tractor in the usual manner.

### KG 302

are equipped with top and lower link pins (Fig. 5.2/1) of cat. II for attaching to tractor top and lower links.

### KE/KG with 4m and 4.5m working width

are equipped with top and lower link pins (Fig. 5.3/1) of cat. II for attaching to tractor top and lower links.

The lower link plates consist of three sections. Thus, connecting tractor lower links of cat. III by attaching transition sleeves (Fig. 5.4/2) and reinserting the lower link pins (Fig. 5.4/1) is possible.

### Rotary cultivators KG 602

are equipped with top and lower link pins (Fig. 5.2/1) of cat. III for attaching to tractor top and lower links.

Connect lower and top link of the tractor according to Fig. 5.1. Secure the pins of the upper and lower links by using linch pins.

Set the top link (Fig. 5.1/1) so that the soil tillage implement stands horizontally **in the working position** and the top link runs more or less parallel to the lower link (Fig. 5.1/2) or drops towards the tractor. When the implement is raised using the tractor's hydraulic system, it tilts forwards and the packer roller and the seed drill have adequate ground clearance.

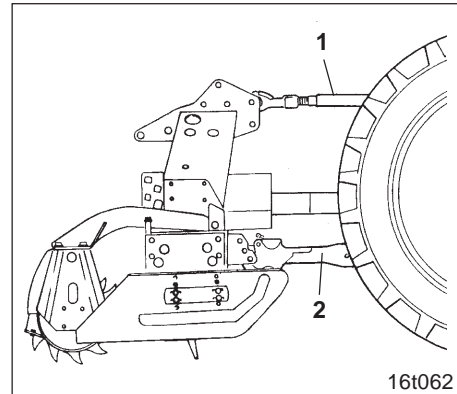


Fig. 5.1

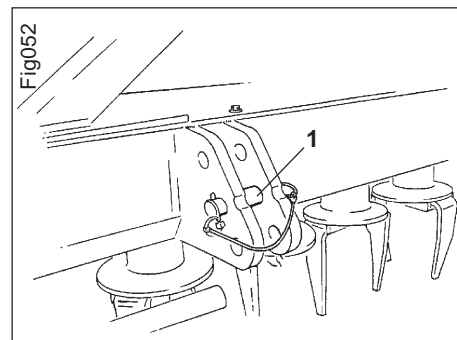


Fig. 5.2



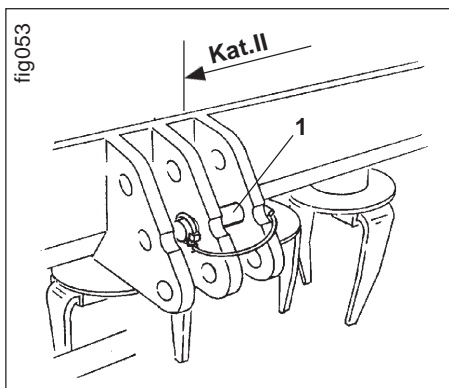
**Note regarding mounting to the lower links:**

The distance between the tractor's pto shaft and the lower hitching points is different for each tractor type. Tractors with a smaller distance require a shorter pto shaft than those with a greater distance. A very short pto shaft is angled very heavily when the rotary cultivator is lifted. This makes turning at the headland impossible while the pto shaft is rotating. Therefore, the lower hitching plates (Fig. 5.2 and Fig. 5.3) have 3 holes which can be used to set the ideal distance.

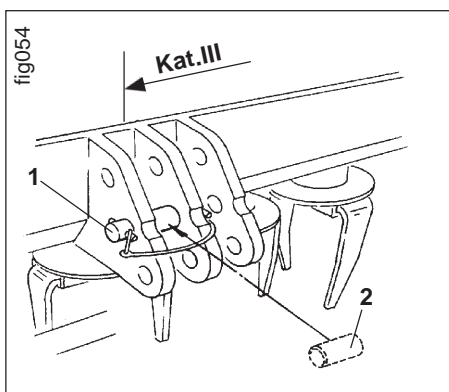


**Note regarding mounting to the top link:**

If the tractor cannot lift the combination of soil tillage implement, culti packer roller and seed drill attach the top link as low as possible to the soil tillage implement and as high as possible to the tractor. This prevents the combination from tilting forward too much when lifting; it may even tilt slightly backwards. Less lifting power is required in this case. Check whether the lifting height is sufficient to ensure an appropriate clearance between the soil tillage implement, culti packer roller, seed drill and the ground.



**Fig. 5.3**



**Fig. 5.4**



## 6.0 Universal joint shaft between Tractor and soil tillage implement

### 6.1 Mounting the pto shaft covers

AMAZONE-rotary harrows and rotary cultivators are equipped with the following main gearboxes

#### KE/KG up to 4,5 m working width:

Exchange gear main gearbox (Fig. 6.1),  
or  
Two-speed shift main gearbox (Fig. 6.2).

#### KG 602:

Three-speed shift main gearbox (Fig. 6.3).

the loose supplied pto shaft cover(s) (Fig. 6.1/1) is (are) to be fastened to the pto shaft inlet and pto shaft outlet (if present).

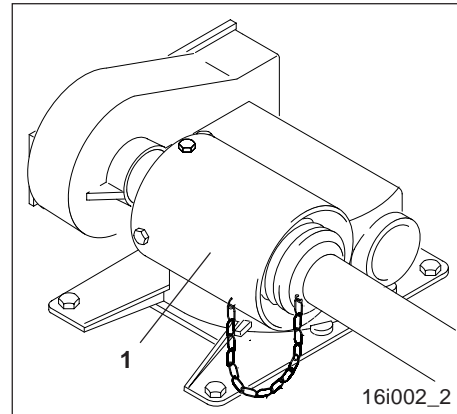


Fig. 6.1

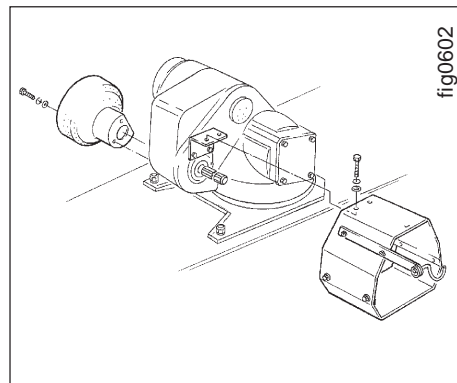


Fig. 6.2

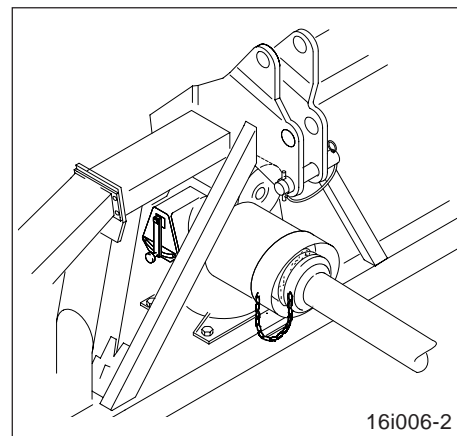


Fig. 6.3



## 6.2 Universal joint shaft types

Only use the universal joint shaft delivered with the soil tillage implement.

### Soil tillage implement up to 4,5 m working width:

Pto shaft W 2500 (Fig. 6.4) with friction clutch EK 96/4 (Fig. 6.5/1) or

Pto shaft W 2500 (Fig. 6.6) with cam clutch EK 64/2 R (Fig. 6.7/1).



**At random the pto shafts W 2500 are equipped with a friction clutch EK 96/4 or a cam clutch EK 64/2 R.**

### Rotary cultivator KG 602:

Pto shaft W 2600 (Fig. 6.8) with cam clutch K 64/2 R (Fig. 6.9/1).



**On stony soils or when hitting an obstacle, rotors and tines may come to a standstill. To avoid gearbox damage, all pto shafts are provided with an overload clutch. Using another pto shaft or another overload clutch is not permitted as otherwise the necessary safety of the gearbox is not guaranteed.**



**Seen in driving direction, the above mentioned pto shafts turn in clockwise direction.!**

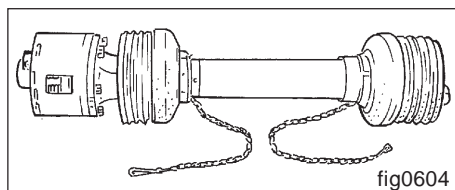


Fig. 6.4

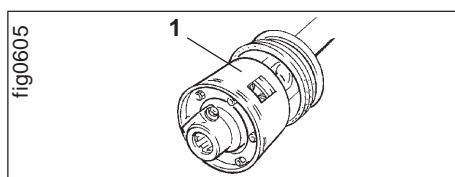


Fig. 6.5

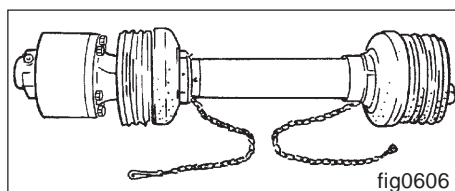


Fig. 6.6

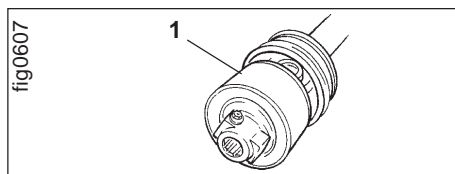


Fig. 6.7

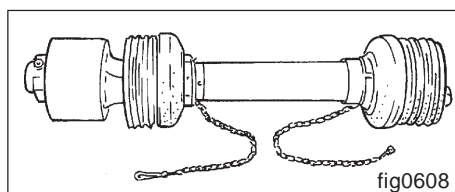


Fig. 6.8

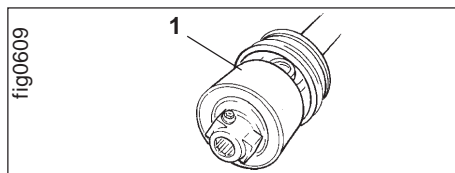


Fig. 6.9



### 6.3 Connecting the universal joint shaft



1. **Connect and disconnect the universal joint shaft only if the pto shaft is deactivated, the engine is switched off and the ignition key has been removed!**
2. **Always make sure that the universal joint shaft is mounted and secured correctly!**  
**Make sure that the protective tubes cover the universal joint shaft during operation and transport!**

Before attaching the universal joint shaft, clean and grease the pto shaft splines on the tractor and the machine..

Connect the universal joint shaft halves to the pto shaft spline on the tractor and to the pto shaft stub of the machine in the prescribed installation position..



1. **Always connect the universal joint shaft half with the overload clutch to the pto shaft spline on the rotary cultivator!**
2. **Pay attention to para. 6.4 before the first use and when coupling the rotary cultivator to another tractor!**
3. **Also pay attention to the universal joint shaft manufacturer's notes regarding assembly attached to the universal joint shaft!**



#### 6.4 First use and adapting the universal joint shaft to another tractor

Before attaching the universal joint shaft, clean and grease the pto shaft splines on the tractor and the machine.

Hitch the soil tillage implement to the tractor. Attach the universal joint shaft half with the overload clutch to the input shaft spline on the rotary cultivator. Attach the second universal joint shaft half to the pto shaft spline on the tractor but do not slide the universal joint shaft tubes into each other.

##### regarding Fig. 6.10/1:

By holding them next to each other, check, whether the universal joint shaft tubes can overlap by at least  $A = 185 \text{ mm}$  in every position of the soil tillage implement.

##### regarding Fig. 6.10/2:

When the two universal joint shaft halves are slid into each other, their ends must never touch the yokes of the universal joints. A spacing of at least 10 mm must be maintained.

##### regarding Fig. 6.10/3:

To match the lengths of the universal joint shaft halves, hold them next to each other in the shortest operating position and mark them.

##### regarding Fig. 6.10/4:

Shorten the inner and outer guard tubes by the same amount.

##### regarding Fig. 6.10/5:

Shorten the inner and outer sliding profile tubes by the same amount as the guard tube.

##### regarding Fig. 6.10/6:

Smooth any rough edges and carefully remove any shavings.

##### regarding Fig. 6.10/7:

Grease the sliding tubes and slide them into one another.

##### regarding Fig. 6.10/8:

The guard tubes of the universal joint shaft have chains which are to be fastened to the tractor and the soil tillage implement as described in para. 6.5. These chains prevent the guard tubes from rotating when the universal joint shaft is running. Attach the chains to the holes provided so that the universal joint shaft has sufficient room for movement in all operational positions and the guard tubes do not rotate during operation.



**Also follow the universal joint shaft manufacturer's notes regarding assembly and maintenance attached to the universal joint shaft!**



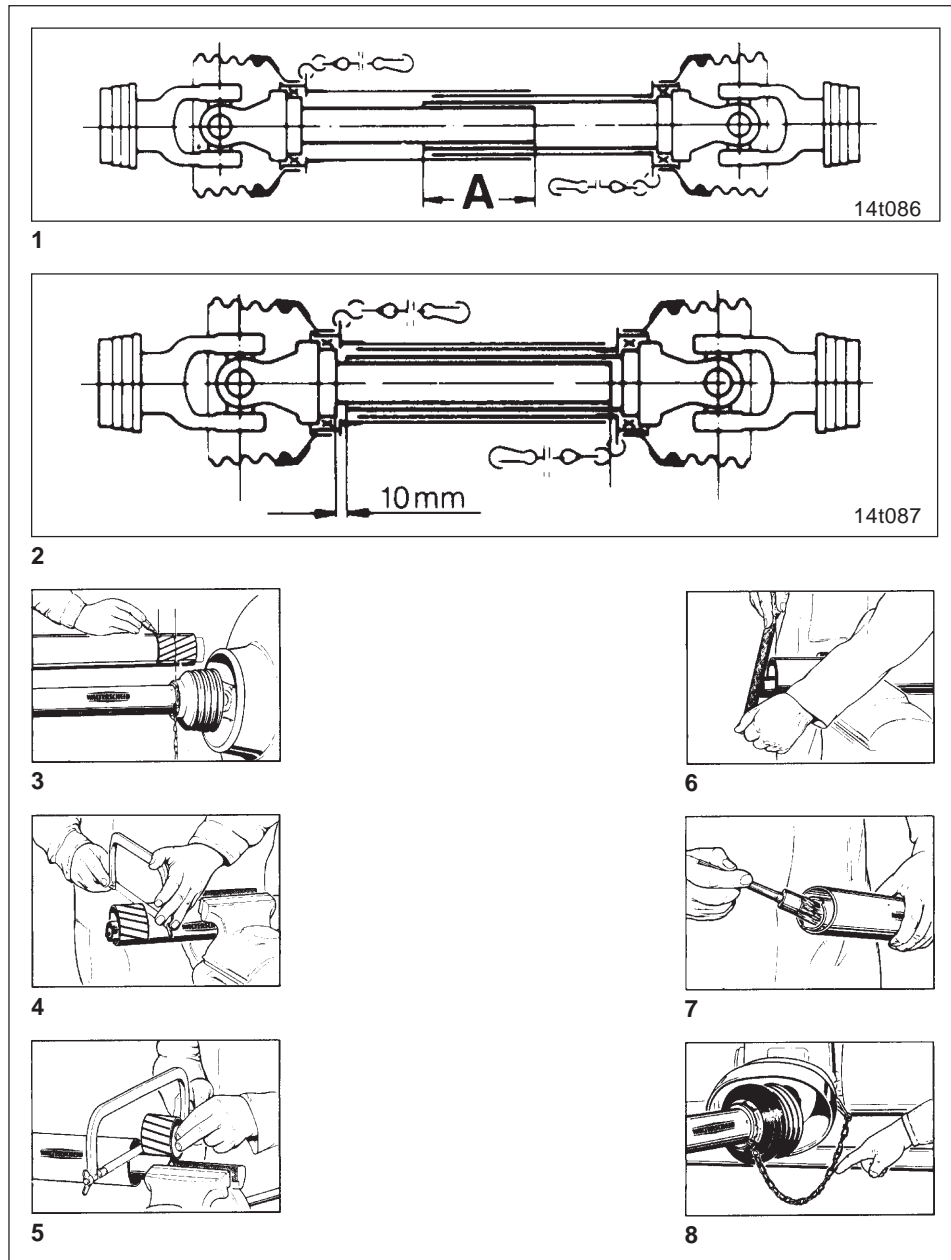


Fig. 6.10



### 6.5 Putting the universal joint shaft into operation

The guard tubes of the universal joint shaft must not rotate during operation. Thus the guard tubes of the universal joint shaft are equipped with safety chains which are to be fastened to the pto shaft covers of the tractor and the gearbox of the soil tillage implement. The safety chain (Fig. 6.11/1) is to be fastened to the pto shaft cover at implement's input shaft. The safety chain is to be fastened to the pto shaft cap at the pto output shaft (if present). The safety chains prevent the guard tubes from rotating when the universal joint shaft is running. Pay attention that the universal joint shaft has sufficient clearance in all operational positions.

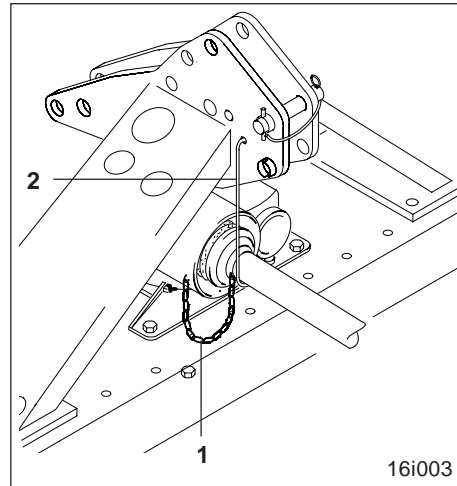


Fig. 6.11

As soon as the universal joint shaft is connected to the tractor, fasten the universal joint shaft support (Fig. 6.12/1) to the carrier (Fig. 6.12/2) and secure by using a linch pin (Fig. 6.12/3).

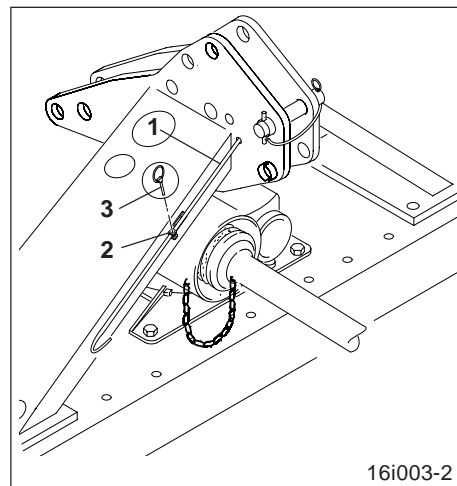


Fig. 6.12



**The following points must be observed before the pto shaft is engaged:**

1. The guard tube and the guard funnel of the universal joint shaft and the pto shaft covers must be attached to both the tractor and the implement and must function correctly!
2. Before engaging the pto shaft, make sure that the pto shaft speed selected on the tractor matches the permissible speed for the implement!
3. Before engaging the pto shaft, make sure that there are no persons in the danger area of the implement!
4. Never engage the pto shaft while the engine is switched off!



1. The friction clutch EK 96/4 (Fig. 6.5/1) must be "aired" before it is used for the first time and after longer operation pauses. The required steps are described in para. 19.
2. To prevent damage, only engage the pto shaft slowly in idling gear or at a low tractor engine speed!
3. Disengage the universal joint shaft before raising the soil tillage implement, e. g. when turning at the headlands, if the universal joint shaft is angled too much.



1. Being caught on a rotating shaft can cause severe injuries or even death.
2. Never remove the pto shaft guards of the soil tillage implement or the tractor.
3. Switch off the engine and make sure that the pto shaft is at a standstill before making adjustments, establishing connections or cleaning pto shaft driven implements.

## 6.6 Standstill of the tines whilst working

The tines or the rotors can come to a standstill in stony soil or when a firm obstacle is hit. To prevent gear damage, all universal joint shafts are equipped with an overload clutch (please refer to para. 6.2):

### Friction clutch EK 96/4 (Fig. 6.5/1):

If the rotors come to a standstill, the tractor's pto shaft is to be disengaged and stopped immediately to prevent damage to the friction clutch to avoid overheating or burning out. The soil tillage implement can be disengaged after the obstacle has been removed (only if the engine is turned off and the ignition key removed) and the friction clutch has cooled down.

### Cam clutches

#### EK 64/2 R (Fig. 6.7/1) and K 64/2 R (Fig. 6.9/1):

If the rotors come to a standstill due to the cam clutch being deactivated, stop and reduce the pto shaft speed of the tractor to approx. 300 R.P.M. until the cam clutch engages audibly. Switch off the pto shaft and remove the obstacle (only if the engine is turned off and the ignition key removed) if the rotors do not start rotating again. The cam clutch is then immediately ready for use.



### 6.7 Taking the universal joint shaft out of operation after work

Before the rotary cultivator is unhitched from the tractor, the universal joint shaft is to be fixed with the universal joint shaft support (Fig. 6.13/1) .

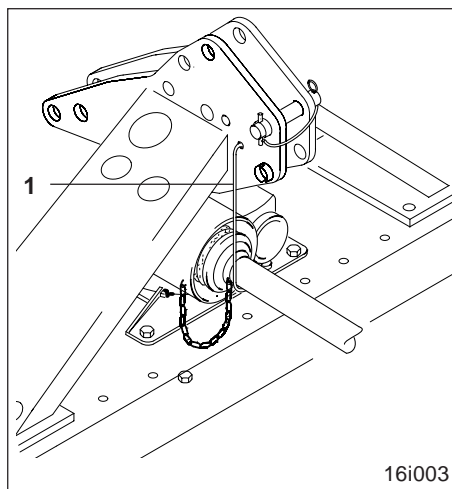


Fig. 6.13



## 7.0 Attaching the AMAZONE-Culti-Packer-Rollers and setting the working depth of the soil tillage implement

During operation the soil tillage implement is supported by the culti packer roller and thus maintains a precise working depth. Therefore, the soil tillage implement must only be used with the following packer rollers:

- AMAZONE-Support Roller SW (up to 3 m working width)
- AMAZONE-Tooth Packer Roller PW 420
- AMAZONE-Tooth Packer Roller PW 500
- AMAZONE-Tyre Packer Roller RP
- AMAZONE-Wedge Ring Roller KW.

### 7.1 Attaching the Tooth Packer Rollers PW 420 and PW 500 and Support Rollers SW

Each packer roller has to be attached to the soil tillage implement with 2 mounting arms (Fig. 7.1/1), e.g. with:

- Carrying arm (Fig. 7.1/2) for tooth packer rollers PW 420 and support rollers SW
- Carrying arm (Fig. 7.1/3) for tooth packer rollers PW 500.

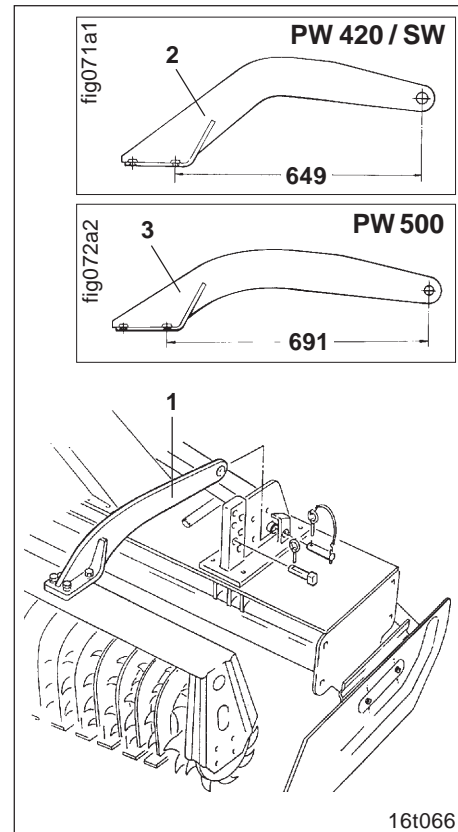


Fig. 7.1

**only KG 602:**

Both machine halves of the rotary cultivator KG 602 (Fig. 7.2) have to be equipped with a 3 m-packer roller. Attach the packer rollers one after the other on the rotary cultivator KG 602.

**all types:**

For coupling, park the packer roller on level ground and secure it both at the front and the back against rolling away.



**Before coupling support tooth packer roller especially carefully (to avoid falling over and rolling away)!**



**The roller is to be fastened to the soil tillage implement with special care because the roller can fall over with improper support. Risk of injury!**

Couple the soil tillage implement to your tractor and drive backwards towards the packer roller. Hitch the mounting arms (Fig. 7.3/1) of the packer roller to the supports (Fig. 7.3/2) of the soil tillage implement using pins (Fig. 7.3/3) and secure using linch pins. (Fig. 7.3/4).

Insert the depth setting pin (Fig. 7.3/5) into the bracings, as described in para. 7.3 into the next higher hole above the mounting arms and secure with linch pins. With these pins the working depth is set later on.

In case you want to use your soil tillage implement as part of a till and drill combination with a pack top seed drill AD, attach the seed drill as described in the seed drill's instruction manual.

Set the working depth of your soil tillage implement as described in para 7.3.

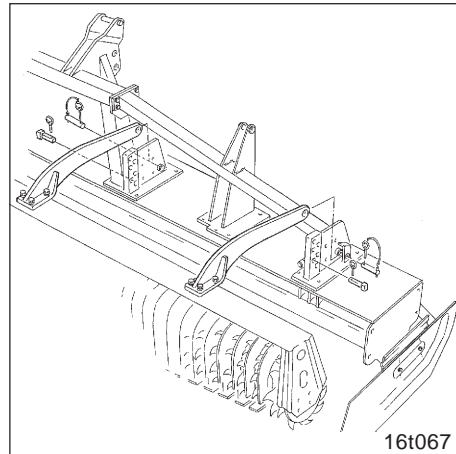


Fig. 7.2

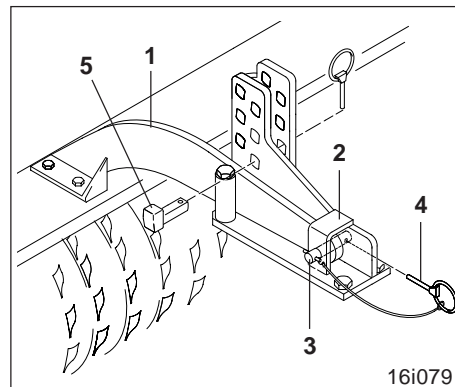


Fig. 7.3



## 7.2 Attaching the Tyre Packer Rollers RP and Wedge Ring Rollers KW

Each roller has to be fixed to the soil tillage implement with 2 mounting arms (Fig. 7.4).

For attaching or removing the packer rollers, always hitch the mounting arms (Fig. 7.5/1) with **two pins** (Fig. 7.5/2 and Fig. 7.5/3) to the rollers. When the combination is equipped with a pack top seed drill (not applicable for pack top seed drills AD-PL) which is attached to the soil tillage implement and the packer roller, remove the upper pins (Fig. 7.5/3) (please refer to instruction manual for pack top seed drills AD-AD-P and AD-PL).



**Arrest the lower pins (Fig. 7.5/2) with 2 washers (Fig. 7.5/4) to prevent the pins moving out of the slotted holes of the lower three point linkage**

If necessary, also fix the brake (Fig. 7.6/1) of the tyre packer roller. When fixing the brake, the two washers (Fig. 7.5/4) are not mounted.

### only KG 602:

Both machine halves of the rotary cultivator KG 602 have to be equipped with each one 3 m-culti packer roller. Attach the rollers one after to other to the rotary cultivator KG 602.

### all types:

Place the packer roller on level ground and secure it both to the back and to the front against rolling away.



**Before attaching, support the packer roller especially well (secure against falling over and rolling away)!**

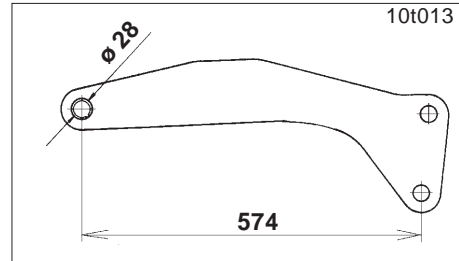


Fig. 7.4

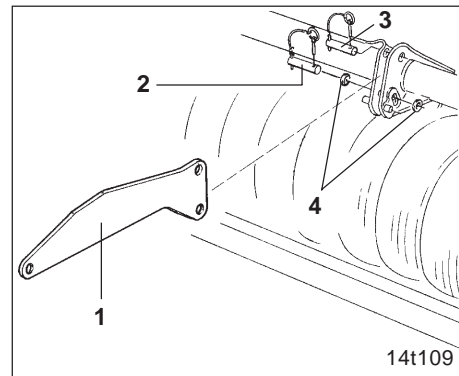


Fig. 7.5

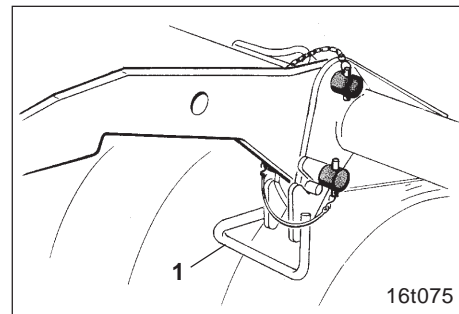
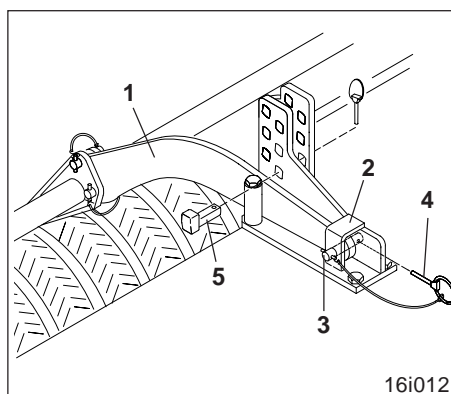


Fig. 7.6



**The roller is to be fastened to the soil tillage implement with special care because the roller can fall over with improper support. Risk of injury!**

Couple the soil tillage implement to your tractor and drive backwards towards the packer roller. Hitch the mounting arms (Fig. 7.7/1) of the packer roller to the supports (Fig. 7.2/2) of the soil tillage implement using pins (Fig. 7.7/3) and secure with lynch pins (Fig. 7.7/4).



**Fig. 7.7**

Insert the depth setting pin (Fig. 7.7/5) as described in para. 7.3 into the next higher hole **above** the mounting arm in the supports and secure with lynch pins. With these pins the working depth will be set later on.

When you intend to use the soil tillage implement as part of a till- and drill combination in conjunction with a pack top seed drill AD, attach the seed drill following the instruction manual of the seed drill.

Set the working depth of the rotary cultivator according to para. 7.3.





### 7.3 Setting the working depth of the soil tillage implement

During operation the soil tillage implement is supported by the packer roller and thus always maintains a precise working depth.

To set the working depth, lift the rotary cultivator slightly using the tractor's hydraulic system and insert the depth setting pins (Fig. 7.8/1) into the desired hole of the adjustment block (Fig. 7.8/2) above the mounting arms (Fig. 7.8/3) and secure using linch pins (Fig. 7.8/4).

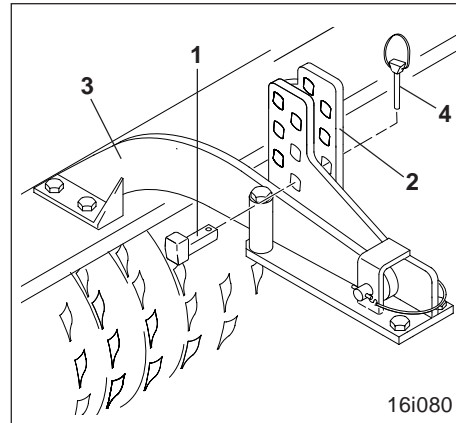


Fig. 7.8



**Make settings only when the pto shaft is disengaged, the engine is switched off and the ignition key has been removed!**



**When re-inserting them, grasp the depth-setting pins (Fig. 7.9/1) in such a way, that your hand never comes between the pin and the mounting arm.**

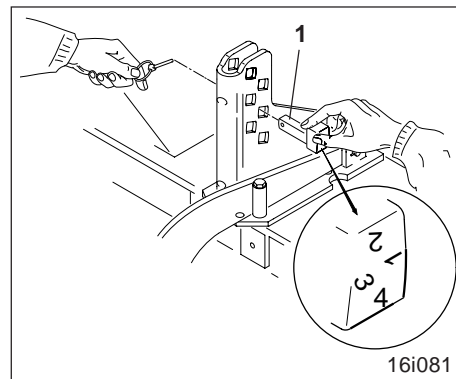


Fig. 7.9

The depth setting pins have a square head, the sides of which are at different distances to the centre of the pins. These sides are marked with the numbers "1 – 2 – 3 – 4" (see Fig. 7.9). It must be ensured that the depth setting pins (Fig. 7.8/1) rest in the same position (bearing the same number) on all mounting arms (Fig. 7.8/3).



**The higher the depth-setting pins are inserted into the adjustment blocks and the higher the numbers on the sides resting against the mounting arms, the deeper the working depth will be.**



The different distances due to the square head of the depth-setting pin allow "fine tuning" of the depth setting of the soil tillage implement, even between the individual square holes in the adjustment block.



**Always secure the depth setting pins using linch pins (Fig. 7.8/4) after every adjustment.**



**If the working depth is adjusted, check whether the side plates have to be adapted to the new working depth.**



## 9.0 Gear boxes

AMAZONE-rotary harrows KE and rotary cultivators KG are equipped with one of the following main gearboxes:

KE/KG with 2,5m up to 4,5m working width:  
Exchange gear main gearbox (Fig. 9.1),  
or  
Two-speed shift main gearbox with shift gear wheels (Fig. 9.2).

### KG 602:

Three-speed shift main gearbox (Fig. 9.3).

## 9.1 Tine rotor speed

To achieve the desired fineness of the seed bed, the tine rotor speed must be adapted to different soil conditions. The tine rotor speed can be adjusted. An increase in the tine rotor speed causes the power requirements and the tine wear to rise disproportionately. Selecting the correct tine speed reduces the cost of ear and increases efficiency.



**Never select a tine speed that is higher than necessary.**

## 9.2 Tractor's pto shaft speed

The tractor's pto shaft speed should be set to 1000 R.P.M.. A lower speed of the pto shaft causes higher torques, which may lead to a quicker wear of the overload clutch. The tractor's pto shaft speed should only be set to 540 R.P.M. when light or loosened soil is to be worked at shallow depths (except for KG 602).



**Rotary cultivators KG 602 may only be used with a tractor pto shaft speed of 1000 R.P.M.**

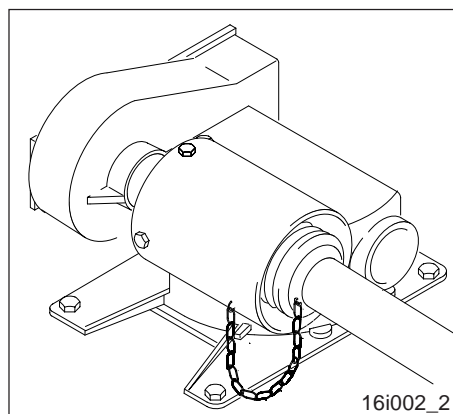


Fig. 9.1

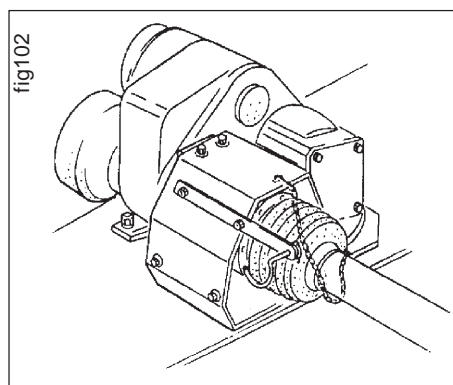


Fig. 9.2

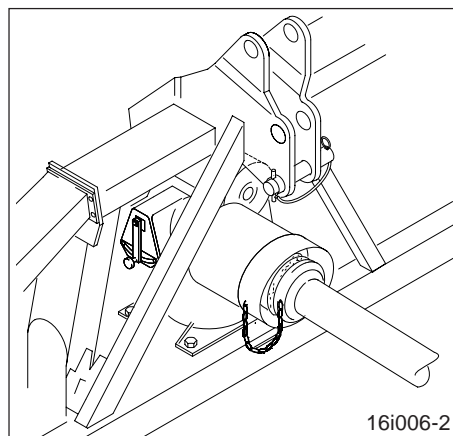


Fig. 9.3



### 9.3 Pto shaft through drive

The pto shaft through drive (Fig. 9.4) allows a pto shaft driven seed drill to be driven. Main two- and three-speed shift gearboxes are equipped with a pto shaft through drive as a standard feature. The exchange gear main gearbox can be easily retrofitted with a pto shaft through drive (see below).

It is advisable to use the AMAZONE "Lift-pack" system to hitch a pto shaft driven seed drill. The soil tillage implement and the pto shaft driven seed drill can continue to run even while turning on the headlands since the soil tillage implement need only be lifted slightly out of the soil while the "Lift-pack" system raises the seed drill to a sufficient height. In this case, both pto shafts are only slightly pivoted (when handled correctly). Disengaging the pto shaft and standstill times at the headlands are thus eliminated. Nor air pressure drop occurs in the pto shaft driven seed drill. The pto shaft of the seed drill must be protected against damage using the height limitation device (option) of the lifting frame. Select a setting which allows the pto shaft to run freely even when lifted.

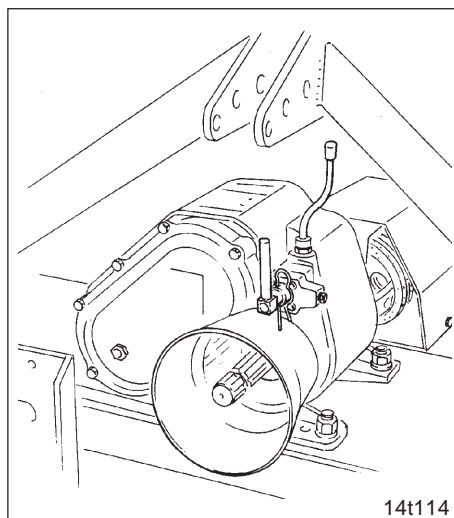


Fig. 9.4



#### 9.4 Exchange gear main gearbox

The rotor speed can be adapted to the kind of soil and the speed of travel by means of the exchange gear main gearbox (Fig. 9.5) to achieve the desired fine seed bed on a variety of different soil types. The tine rotor speed can be adjusted by replacing two gear wheels in the gearbox. Exchanging the gear wheels is described in para. 9.4.2.

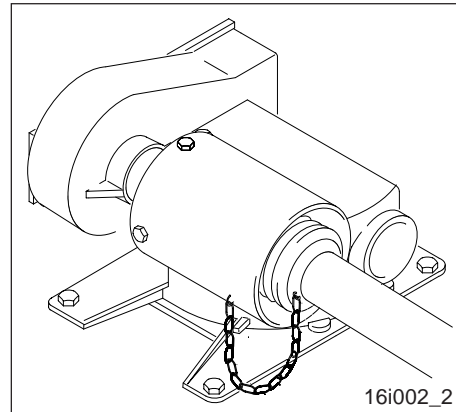


Fig. 9.5

#### 9.4.1 Speed table for the exchange gear main gearbox

Please refer to the speed table (Fig. 9.6) for the time speed.

The tine rotor speed depends on the gear set installed in the gearbox and the speed of the tractor's pto shaft.

The tractor's pto shaft speeds 540 R.P.M., 750 R.P.M. and 1000 R.P.M. which can be selected can be taken from the tine speed table under the tractor symbol (Fig. 9.6/3).



**We recommend you to set the tractor pto shaft speed to 1000 R.P.M.**

The figures below the tractor pto shaft speeds indicate the tine rotor speeds that can be selected. Die The tine rotor speeds can be set by inserting the gears according to the list below the gearbox symbol.

**Example:**

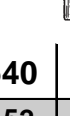
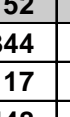

A gear wheel with 26 teeth is mounted on the drive shaft (Fig. 9.6/1).

A gear wheel with 39 teeth is mounted on the auxiliary shaft Fig. 9.6/2). The tine rotor speed would be:

- at 1000 R.P.M. tractor pto speed: 282 R.P.M.
- at 750 R.P.M. tractor pto speed: 212 R.P.M.
- at 540 R.P.M. tractor pto speed: 152 R.P.M.

The tine rotor speeds and the two gear wheels with 26 and 39 teeth are shaded in the speed table. These gear wheels are installed in the gearbox as standard.

Other tine rotor speeds can be selected by removing the standard gear set and inserting another gear set (please refer to table).

|  |                |                |   |    |
|--|----------------|----------------|---|----|
| 540  | 750            | 1000           | 39  | 26 |
| 152  | 212            | 282            | 39  | 26 |
| 344  | 478            | 637            | 26  | 39 |
| 117  | 163            | 217            | 43  | 22 |
| 448  | <del>622</del> | <del>829</del> | 22  | 43 |
| 134  | 186            | 248            | 41  | 24 |
| 391  | <del>543</del> | <del>724</del> | 24  | 41 |
| 185  | 257            | 342            | 36  | 29 |
| 284  | 395            | <del>526</del> | 29  | 36 |
| 209  | 290            | 387            | 34  | 31 |
| 251  | 349            | 465            | 31  | 34 |
| KG +  |                | 526            | 29  | 36 |
|  |                | 637            | 26  | 39 |
|  |                | 724            | 24  | 41 |
| R.P.M.   |                |                | number of teeth per gear wheel  |    |

**Fig. 9.6**

t140qb02



1. The setting of the crossed tine rotor speeds, e. g. 829 R.P.M. shown in the speed table (Fig. 9.6) is not permitted due to the too high speed.
2. The setting of tine rotor speeds (at 1000 R.P.M. tractor pto shaft speed) beside the symbol (Fig. 9.6/4) are only applicable for AMAZON rotary cultivators, which are equipped with mowing knives incl. guards for mowing set asides. The setting of one of these tine rotor speeds for soil tilling is not permitted.

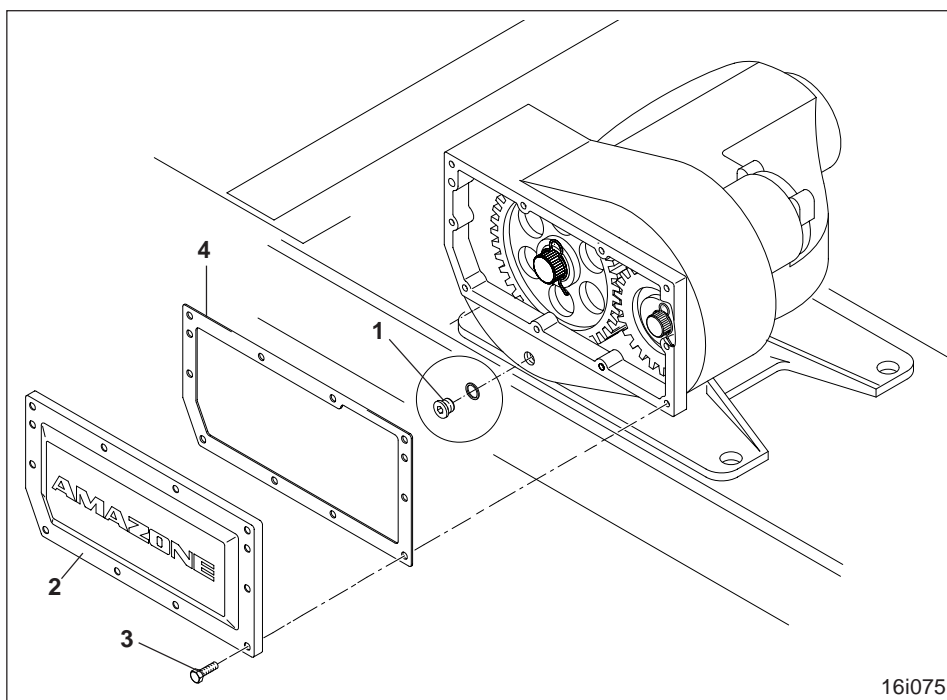


Fig. 9.7

#### 9.4.2 Replacing the exchange gear wheels exchange gear main gearbox

For replacing the exchange gear wheels in the exchange gear main gearbox (Fig. 9.7

- lift the soil tillage implement, e. g. with the tractor's hydraulic system until the soil tillage implement is tilted for approx. 30° to the front. Even if the gearbox lid is open, the gear oil will not penetrate.



**Ensure that the implement is supported properly!**

The oil level may also be reduced by draining the oil using the oil drain plug (Fig. 9.7/1). The collected gear oil can be poured back into the gearbox through the opening

channel of the oil level plunger (Fig. 9.9/1), provided the oil is still clean.



1. **Remove the gearbox lid (Fig. 9.7/2) only when the tractor's pto shaft is disengaged, the engine has been switched off and the ignition key has been removed.**
2. **Wait until the rotors have come to a complete standstill!**
3. **Do not touch the hot gearbox or gear parts and gears with your barehands! Use gloves!**
4. **Avoid contact with the hot gear oil!**
5. **Use suitable tools!**





- Remove the gearbox lid (Fig. 9.7/2) from the gearbox housing after the hex bolts (Fig. 9.7/3) have been removed.
- Retaining springs (Fig. 9.8/2) secure the gear wheels (Fig. 9.8/1) against axial movement on the shaft stubs. Remove retaining springs (Fig. 9.8/2). Pull the gear wheels off the shaft stubs of the drive shaft (Fig. 9.8/3) and the auxiliary shaft (Fig. 9.8/4). Interchange the gear wheels in the gearbox following the speed table (Fig. 9.6) or replace by another set of gear wheels.
- Close gearbox lid (Fig. 9.7/2) with the lid gasket (Fig. 9.7/4) and bolt onto the gearbox housing.
- Check the oil level on the oil level plunger (Fig. 9.9/1) with the soil tillage implement in horizontal position. The oil coating must be visible on the oil level plunger (Fig. 9.9/1) below the "max." mark. If necessary top up gear oil.  
The total amount of gear oil 85 W 90 is 4,8 l.

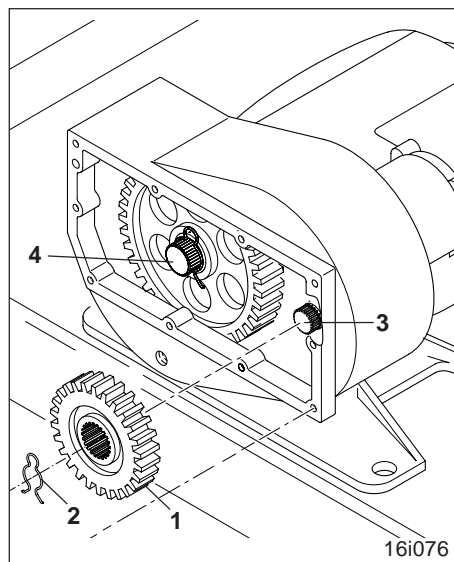


Fig. 9.8

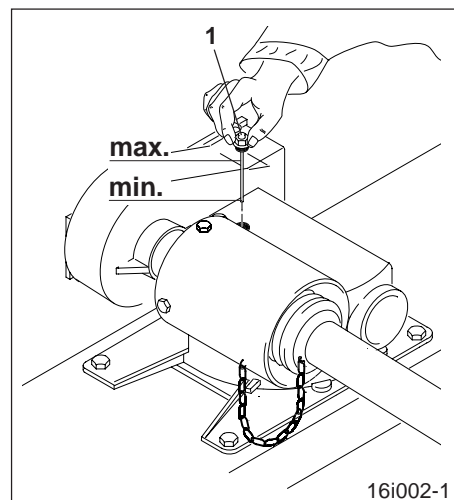


Fig. 9.9

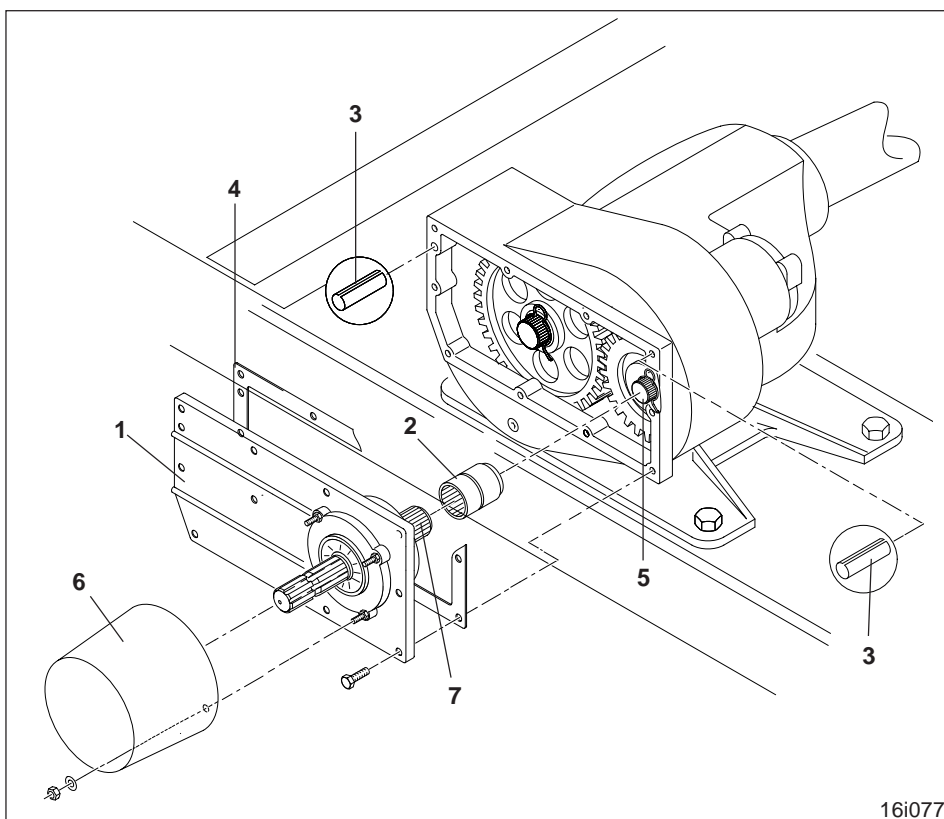


Fig. 9.10

#### 9.4.3 Pto shaft through drive on the exchange gear main gearbox

Driving a pto shaft driven seed drill with the exchange gear main gearbox requires retrofitting of the pto shaft through drive (Fig. 9.10) as described in para. 9.4.5.

The maximum performance of the pto shaft output is:

- at 540 R.P.M. approx. 22 kW (30 HP) and
- at 750 R.P.M. approx. 29 kW (40 HP) and
- at 1000 R.P.M. approx. 40 kW (55 HP).

The rotating direction of pto shaft input and output are the same. When seen in the driving direction, the pto shaft turns clockwise.

The gearbox input and output speeds are the same.

#### 9.4.4 Angle power take off for the AD-P blower fan

To drive the blower fan of the neumatic Pack Top seed drill AD-P the exchange gear main gearbox has to be equipped with an angle power take off (Fig. 9.11) .

For fitting, please refer to para. 9.4.5.

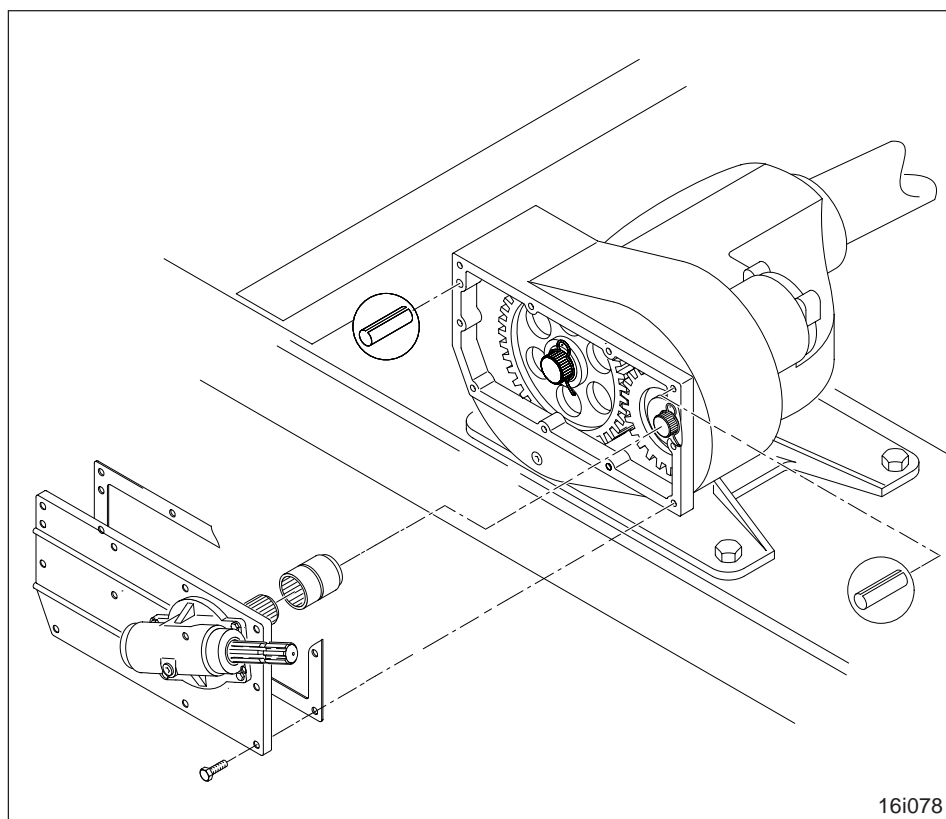


Fig. 9.11

#### 9.4.5 Fitting the pto shaft through drive and the angle power take off

For fitting the pto shaft through drive and the angle power take off the gearbox lid (Fig. 9.10/1) has to be exchanged. The procedure is identical and is explained in the following under: Fitting the pto shaft through drive.

- Unscrew present gearbox lid as described in para. 9.4.2.

- Insert the connecting tubular bushing (Fig. 9.10/2) with internal circlip on the through drive shaft (Fig. 9.10/7).
- Centre the gearbox lid (Fig. 9.10/1) using two cylinder pins (Fig. 9.10/3) and – using a new gasket (Fig. 9.10/4) – bolt it to the gearbox. Slide the connecting tubular bushing (Fig. 9.10/2) onto the drive shaft (fig. 9.10/5).

#### only for gearbox lid with pto shaft through drive:

- Bolt the protective cap (Fig. 9.10/6) to the gearbox lid.



**Observe safety advice!**


**only gearbox lid with angle power take off:**

- Only drive the angle power take off (Fig. 9.11) with coupled AD-P and connected pto shaft (please refer to AD-P instruction manual).

**all types:**

- Check the oil level on the oil level plunger (Fig. 9.9/1) with the soil tillage implement in horizontal position. Top up oil if necessary. The oil coat must be visible on the oil level plunger (Fig. 9.9/1) below the "max."-mark. The total quantity of oil 85 W 90 is: 4.8 l.

**9.5 Two speed-shift main gearbox with exchange shift gear wheels**

The two-speed shift main gearbox (Fig. 9.12/1) is equipped with a shift lever (Fig. 9.12/2) that has two positions, allowing two rotor speeds to be selected:

Position [1] (Fig. 9.12):

Push the shift lever into the gearbox housing,

Position [2] (Fig. 9.12):

Pull the shift lever out of the gearbox housing.

The shift lever is kept in position with a retaining spring (Fig. 9.12/4) which must be removed prior to moving the lever and reinserted when the desired position has been selected.



- 1. Move the shift lever only when the tractor's pto shaft is disengaged, the engine is switched off and the ignition key has been removed!**
- 2. Wait until the rotors have come to a complete standstill!**
- 3. Do not touch the hot gearbox housing or gear parts with your bare hands! Use gloves!**

The shift main gearbox also has a gear set which can be interchanged or replaced by another gear set. Interchanging and replacing the gear sets in the gearbox is described in para. 9.5.3.

When the gear sets have been interchanged or replaced, the shift lever can be used to choose between two speeds.

The table Fig. 9.13 provides an overview of the possible rotor speeds, gear sets and

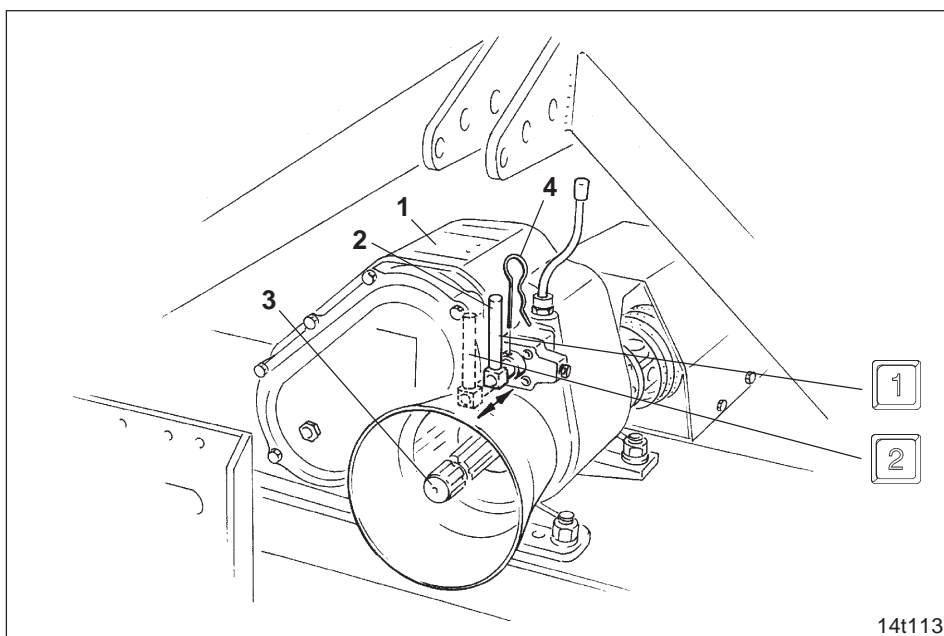


Fig. 9.12

shift lever positions.

#### 9.5.1 Pto shaft through drive on the two-speed shift main gearbox

The shift main gearbox is equipped with a pto shaft through drive (Fig. 9.12/3) to drive a pto-shaft driven seed drill.



1. The gearbox input and output speeds are the same.
2. The direction of rotation is the same for both the pto shaft input and output. When seen in driving direction, the shaft turns clockwise.

#### 9.5.2 Speed table for Two-speed shift main gearbox

Please refer to the speed table (Fig. 9.13) for the tine speed.

The tine rotor speed depends on the gear set installed in the gearbox, the position of the shift lever and on the selected speed of the tractor's pto shaft..

The speed table under the tractor symbol (Fig. 9.13/3) indicates the tractor pto shaft speeds 1000 R.P.M. or 540 R.P.M.



**We recommend to set the tractor's pto shaft speed on 1000 R.P.M.**

The figures below the tractor pto shaft speeds indicate the tine rotor speeds that can be selected.

The tine rotor speed can be set by inserting the gears according to the list below the gearbox symbol. Two tine rotor speeds can




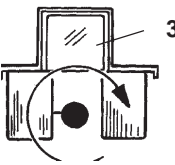
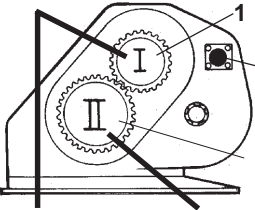
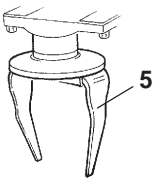
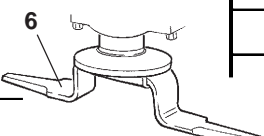
|   |  |  |  |
|---|--|--|--|
| <br>951222         | <br><div> <div>1000</div> <div>540</div> </div> | <br><div> <div>1</div> <div>2</div> </div> | <div> <div>1</div> <div>2</div> </div> |
| <b>KG / KE</b><br> | <div> <div>310</div> <div>167</div> </div>   | <div> <div>23</div> <div>28</div> </div>   | <div> <div>1</div> <div>2</div> </div> |
| <b>KG</b><br>     | <div> <div>581</div> <div>314</div> </div>   | <div> <div>28</div> <div>23</div> </div>   | <div> <div>2</div> <div>1</div> </div> |
|   | <div> <div>535</div> <div>288</div> </div>   | <div> <div>30</div> <div>21</div> </div>   | <div> <div>1</div> <div>2</div> </div> |
|   | <div> <div>680</div> <div>367</div> </div>   | <div> <div>30</div> <div>21</div> </div>   | <div> <div>2</div> <div>1</div> </div> |
|   | <b>R.P.M.</b>  | <b>Number of teeth<br/>per gear</b>  |  |

Fig. 9.13

t140gb07

be set using the shift lever without interchanging the gears of a gear set or replacing the entire gear set. The shift lever on the gearbox can be set to either position 1 or 2 (Fig. 9.13/4):

**Position [1]:**

Push the shift lever into the gearbox housing,

**Position 2 [2]:**

Pull the shift lever out of the gearbox housing.

**Example:**

**a gear wheel with 23 teeth is mounted on drive shaft I (Fig. 9.13/1),**

**a gear wheel with 28 teeth is mounted on drive shaft II (Fig. 9.13/2).**

**The tine rotor speed at a tractor's pto shaft speed of 1000 R.P.M. would be:**

- in position 1 : 310 R.P.M.
- in position 2 : 392 R.P.M.

**a gear wheel with 23 teeth is mounted on drive shaft 540 R.P.M. would be:**

- in position 1 : 167 R.P.M.
- in position 2 : 212 R.P.M.

The spur gears with 23 and 28 teeth are shaded in the speed table. These gears are installed in the gearbox as standard by the factory.



Other tine rotor speeds can be selected by interchanging the gear set in the gearbox or by removing the standard gear set and inserting another gear set (see table).



1. **For soil tillage only select the tine rotor speeds beside the symbol (Fig. 9.13/5).**
2. **Setting the tine rotor speeds (at 1000 R.P.M. tractor's pto shaft speed) beside the Symbol (Fig. 9.13/6) are only applicable for AMAZONE-rotary cultivators which are equipped with mowing blades and mowing blade guards for mowing set asides. Setting one of these tine rotor speeds for soil tillage is not permitted.**

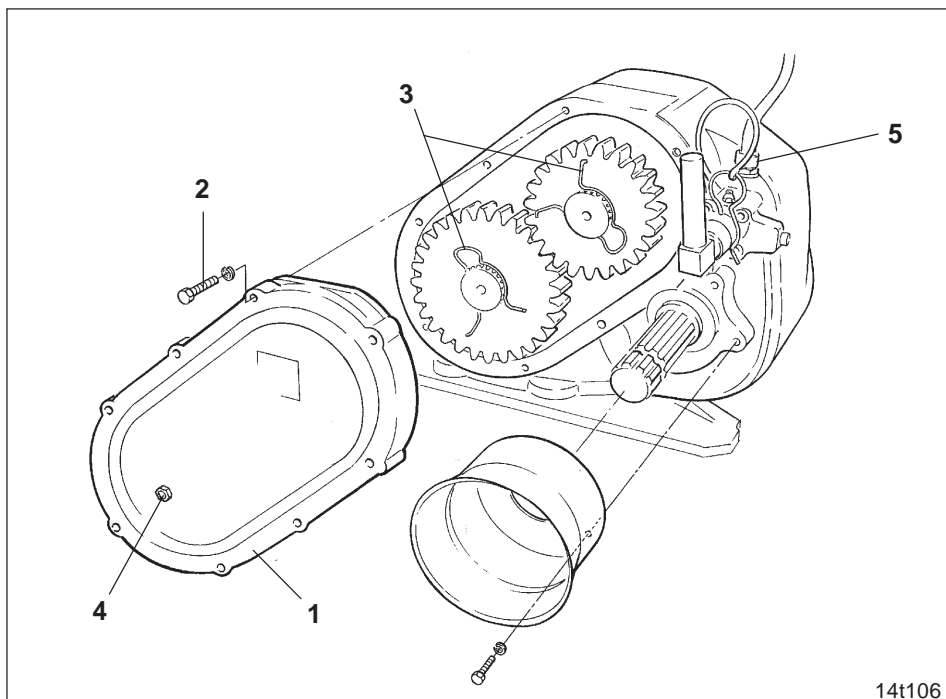


Fig. 9.14

### 9.5.3 Replacing the shift gear wheels in the two-speed shift main gearbox

#### To replace the shift gear wheels in the two-speed shift main gearbox

- Reduce the oil level by draining the oil using the oil drain (Fig. 9.15/2). The collected oil can be poured back into the gearbox through the opening channel in the breather (Fig. 9.14/5) after the gears have been exchanged, provided that the oil is still clean.



**1. Remove the gearbox lid (Fig. 9.7/2) only when the tractor's pto shaft is disengaged, the engine has been switched off and the ignition key has been removed.**

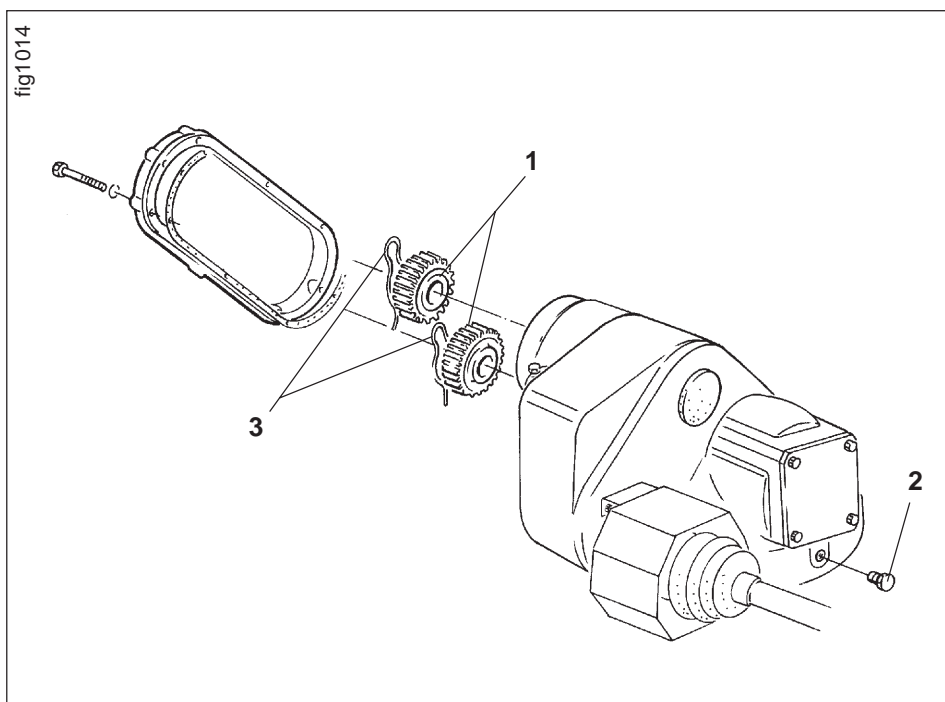
**2. Wait until the rotors have come to**

**a complete standstill!**

- 3. Do not touch the hot gearbox or gear parts and gears with your barehands! Use gloves!**
- 4. Avoid contact with the hot gear oil!**
- 5. Use suitable tools!**

- Remove the gearbox lid (Fig. 9.14/1) after the hex. bolts (Fig. 9.14/2) have been removed.
- Retaining springs (Fig. 9.14/3) secure the gear wheels against axial movement on the shaft stubs. Remove retaining springs. Pull the gear wheels (Fig. 10.14/1) off the shaft stubs. Interchange the gear wheels in the gearbox following the speed table (Fig. 9.13) or replace by another set of gear wheels.
- Install retaining springs (Fig. 9.14/3) on both shafts.



**Fig. 9.15**

- Close gearbox lid (Fig. 9.14/1) with the lid gasket (Fig. 9.7/4).
- Pour back the gear oil through the opening channel in the breather screw (Fig. 9.14/5). When the soil tillage implement is in level position, the oil coating must be visible in the oil level (Fig. 9.14/4). The total amount of gear oil is 4,8 l (85 S 90 gear oil).



## 9.6 Three-speed Shift main gearbox

Rotary cultivators KG 602 are equipped with a three-speed shift main gearbox (Fig. 9.16/1). The provided shift lever (Fig. 9.16/2) allows to select three positions or three tine rotor speeds.



1. **Move the shift lever only when the tractor's pto shaft is disengaged, the engine is switched off and the ignition key has been removed!**
2. **Wait until the rotors have come to a complete standstill!**
3. **Do not touch the hot gearbox or gear parts and gears with your bare hands! Use gloves!**

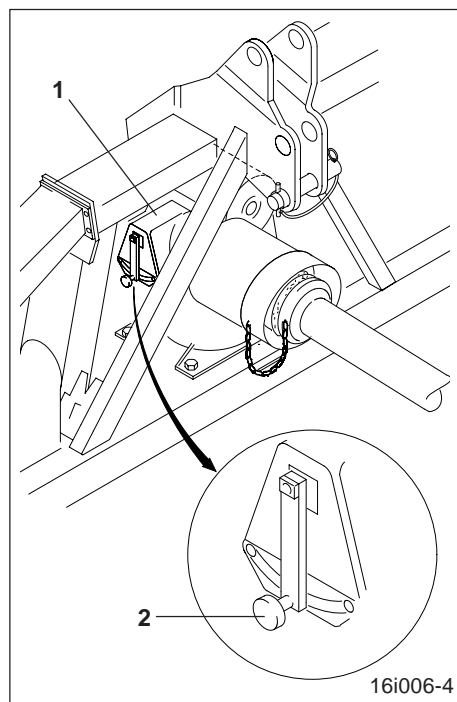
The table (Fig. 9.17) provides an overview of the possible rotor speeds and shift lever positions. The shift lever (Fig. 9.16/2) is locked by a spring loaded catch. Before any movement the shift lever must be pulled out. The newly chosen gear has then correctly been set, when the shift lever is locked.



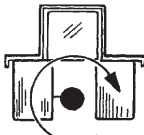
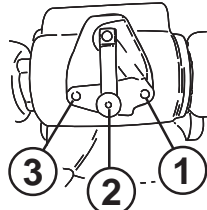
**The tractor's pto shaft speed must always set to 1000 R.P.M.**



**Mowing set asided with an AMA-ZONE rotary cultivator with mowing blades is not permitted.**



**Fig. 9.16**

|   |   |
|---|---|
| 953649<br>KG 602  |   |
|  |  |
| <b>1000</b>   |   |
| <b>228</b>  | <b>1</b>  |
| <b>314</b>  | <b>2</b>  |
| <b>368</b>  | <b>3</b>  |
| <b>R.P.M.</b>   | <b>shift lever-<br/>position</b>  |

**Fig. 9.17**

t140gb03



#### **9.6.1 Pto shaft through drive on the three-speed shift main gearbox**

The shift main gearbox is equipped with a pto shaft through drive to drive a pto shaft driven seed drill. Both, gearbox input speed and output speed are the same. The rotating direction of the pto shaft input and – output are the same. Seen in driving direction, the shaft turns clockwise.





## 10.0 Side plates

The side plates (Fig. 10.1/1) ensure that the tilled soil cannot escape laterally or from between the tillage implement and the packer roller. The flow of soil is guided towards the rear so that it falls directly under the culti packer roller.

As standard, rotary harrows KE are equipped with spring supported side guide plates (Fig. 10.1/1).

As standard rotary cultivators KG are equipped with hinged side guide plates (Fig. 10.2/1).

Of course, also rotary harrows can be equipped with these hinged side plates.

The working depth of the side plates (only implements with hinged side plates) and the spring tension must be adjusted to the soil conditions, so that the limitation of the soil flow from these plates becomes effective.



**Make settings on the side plates only when the pto shaft is deactivated, the engine is switched off and the ignition key has been removed!**

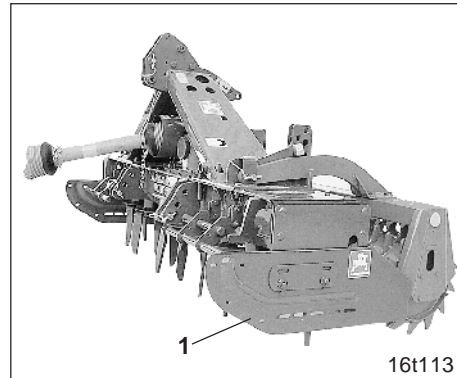


Fig. 10.1

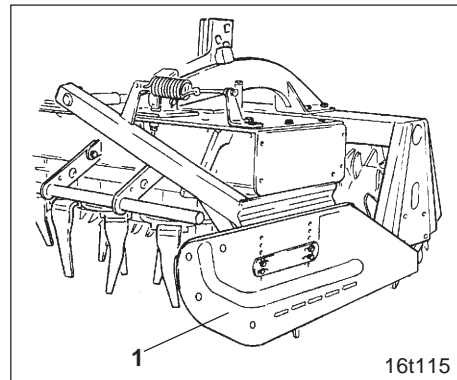


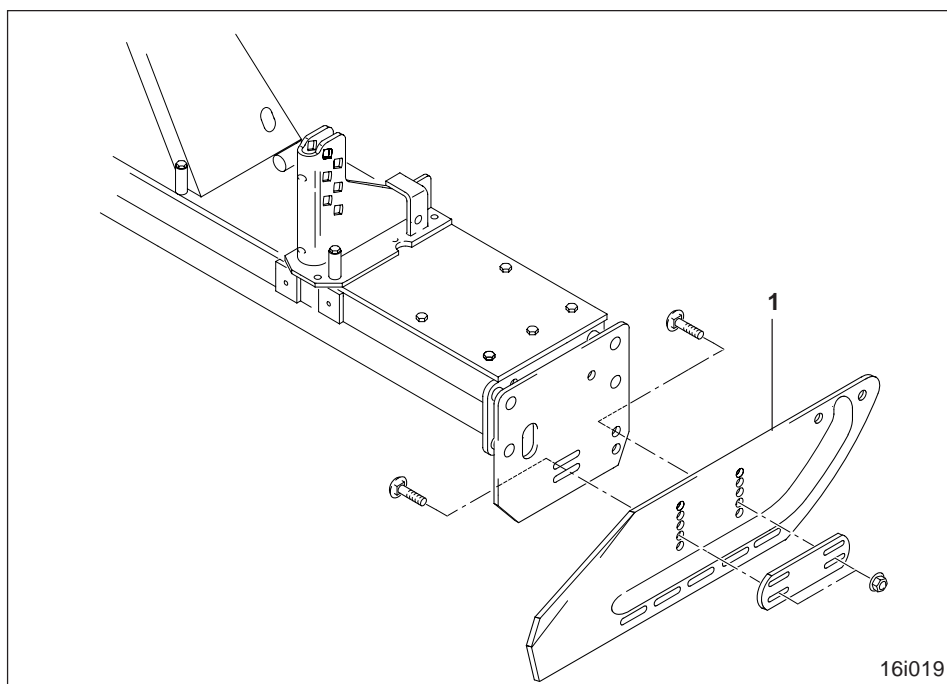
Fig. 10.2



### 10.1 Setting the working depth of the side plates

When the seed bed is prepared after ploughing, the side plates (Fig. 10.3/1) are to be bolted in such a way that they move through the soil at a maximum depth of 1 to 2 cm.

This setting can also be used for incorporation straw. If, under unfavourable conditions, the side plates push the straw together, the plates should be set at an angle, e. g. the front higher than the back or all the way up.



**Fig. 10.3**



## 10.2 Fitting the hinged side plates

### Fitting the swivelling arm:

Position the pivot arm (Fig. 10.4/2) approximately vertically and push it into the holder tube until it stops. Lower the pivot arm behind the lock (Fig. 10.4/7). Pull the tension spring (Fig. 10.4/3) according to para. 10.3 and secure by using a counter nut (Fig. 10.4/5).

### Fitting the side plates:

Bolt on the side plates (Fig. 10.4/1) as described in para. 10.1.

## 10.3 Adapting the spring tension to the soil conditions

The hinged side plates can move upwards to avoid obstacles. The side plate's own mass and a strong tension spring (Fig. 10.4/3) return the side plate to its working position. The spring has been set at the factory for the use on light to medium soils. The spring tension must be increased on heavy soils and decreased for incorporating straw. The tension can be adjusted using the tensioning bolt (Fig. 10.4/4). Before every adjustment, loosen the counter nut (Fig. 10.4/5) and retighten when finished.

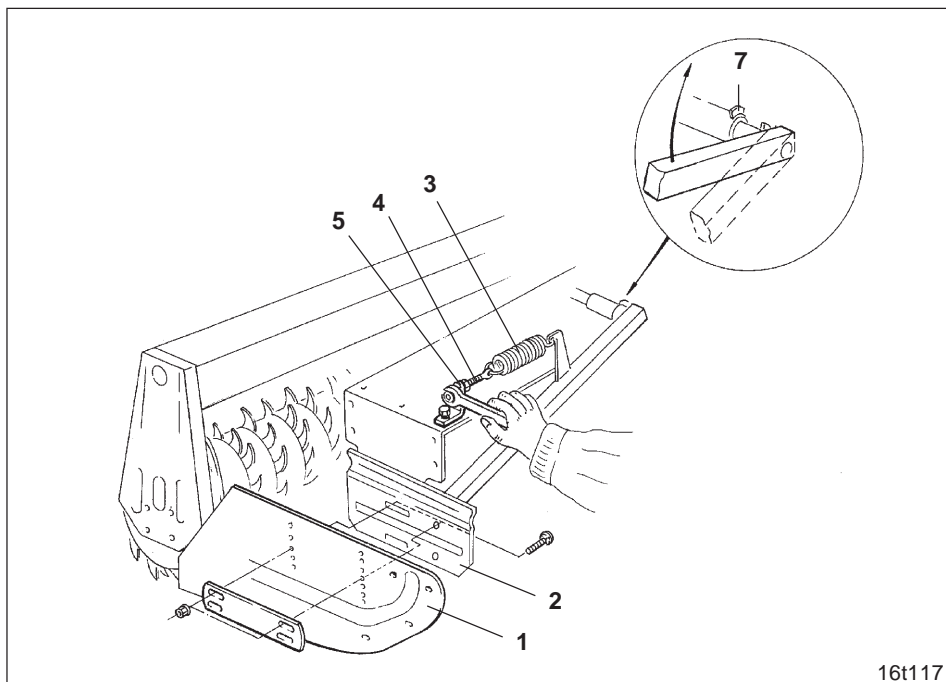


Fig. 10.4







## 11.0 Tooth packer rollers

The tines of the soil tillage implement break up and loosen the soil. AMAZONE tooth packer rollers (Fig. 11.1) pack and till the soil and precisely control the working depth of the soil tillage implement.

Due to the fine seed bed, the seed drill can run smoothly during the sowing process which leads to precise maintenance of the sowing depth for the seed.

The tooth packer rollers up to 4 m working width are available in two sizes (PW 420 and PW 500). From 4.5 m working width, the tooth packer roller PW 500 is available.

The AMAZONE tooth packer roller PW 420 with a roller diameter of 420 mm is suited for heavy soils.

For sowing combinations with a pack top seed drill we recommend the AMAZONE tooth packer roller PW 500. With its roller diameter of 500 mm, this roller is suited for all kinds of soil and is especially useful for varying soil types.

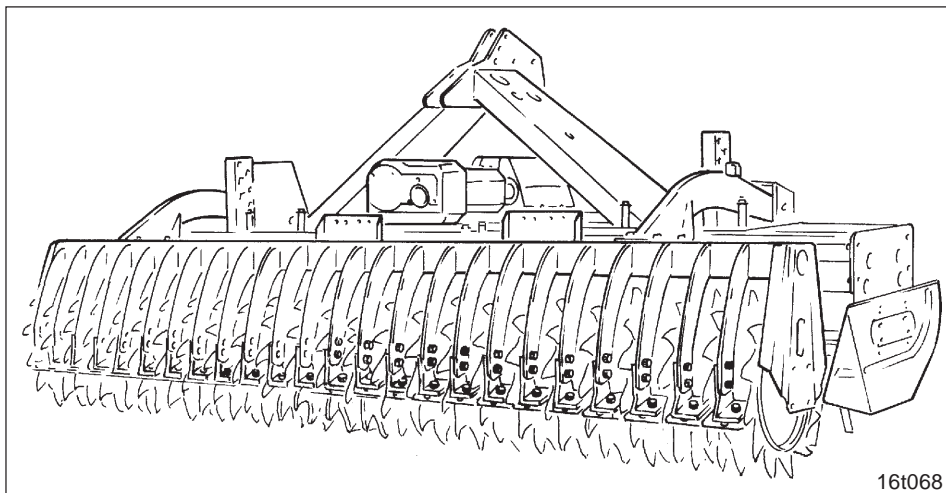


**Standing on the culti packer roller during operation is prohibited!**

## 11.1 Setting the scrapers

Low adjustable scrapers (Fig. 11.3/1), made of spring steel prevent the roller from jamming. The scrapers have been set at the factory for light and medium soils. In case of very sticky soils, the scrapers must be set according to the soil conditions (close setting). However, the "close setting" is only necessary if the soil coating the roller drum is thicker than 2 mm.

The position of the scrapers should be adjusted to offset wear. Heavily worn scrapers must be replaced.



**Fig. 11.1**



### Adjusting the scrapers

- Raise the soil tillage implement using the tractor's hydraulic system and then lower the entire weight of the culti packer roller onto a block of wood (Fig. 11.2/1) placed beneath the middle of the roller. The frame of the culti packer roller thus bends as it would during operation when the soil tillage implement is supported on the culti packer roller.
- Adjust the position of the scrapers (Fig. 11.3/1) so that they touch the roller drum and secure in place by tightening the previously slackened locking bolts (Fig. 11.3/2). The scrapers (Fig. 9.2/1) should only slightly contact the roller drum.

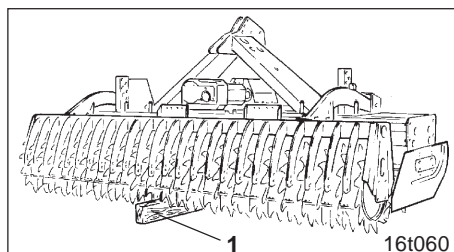


Fig. 11.2

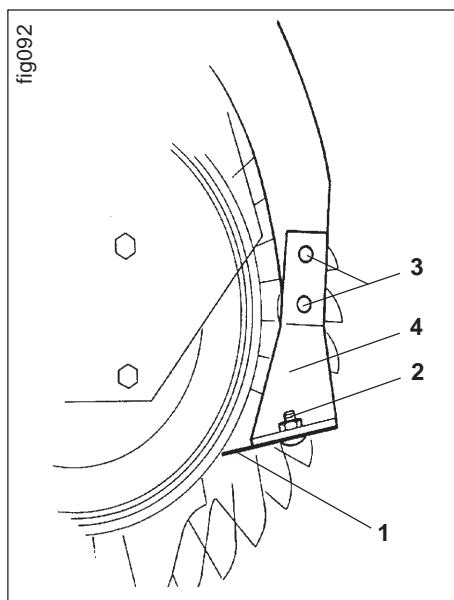


Fig. 11.3

### Close setting:

- Slacken all of the locking bolts (Fig. 11.3/2) and slide the scrapers (Fig. 11.3/1) towards the rear of the slotted hole until they stop.
- Slacken the bolts (Fig. 11.3/3) and, according to the soil conditions, slide the scraper holders (Fig. 11.3/4) evenly upwards and retighten.
- Adjust the scrapers (Fig. 11.3/1) so that they touch the roller drum and secure in place by tightening the fixing bolt (Fig. 11.3/2). The scrapers (Fig. 11.3/1) should only slightly contact the roller drum.



**Attach scrapers with hard metal coating with a gap of 0.5 mm towards the drum and tighten with the fixing bolts. The scrapers with hard metal coating may not touch the roller drum to avoid damage of the roller drum.**



## 12.0 Coupling the hitched seed drills

AMAZONE-hitched seed drills can be attached to the soil tillage implement using the „adjustable coupling parts“ (see Fig. 12.1 and Fig. 12.2).

The „adjustable coupling parts (optional extras) are available in three models:

- soil tillage implements with tooth packer rollers PW 420 and support rollers,
- soil tillage implements with tooth packer rollers PW 500,
- soil tillage implements with tyre packer rollers RP.

Fig. 12.9 shows an AMAZONE rotary cultivator KG with 3 m working width, tyre packer roller RP 302 EN and the „adjustable coupling parts“.



**Disengage the universal joint shaft if it pivots too much at the headlands or during lifting to prevent damage to the universal joint shaft. Do not lift the combination using the tractor's hydraulic system until the soil tillage implement has come to a standstill.**



Fig. 12.1



### Coupling the seed drill

- Drive the soil tillage implement up to the seed drill.
- Set the supports (Fig. 12.4/8) so that the seed drill can be coupled easily.
- Slide the fastening plates (Fig. 12.4/9) onto the pins of the lower link arms and secure using linch pins.
- Connect and secure the top link cat. II (Fig. 12.1/1) to the upper coupling points of the seed drill and the soil tillage implement using pins (Fig. 12.4/11). Adjust the seed drill so that it is level.

### 12.1 Using a till and drill combination without culti packer roller

In general, the soil tillage implement should only be used in combination with a packer roller. If it is inadvisable to use the roller behind the soil tillage implement due to excessively damp soil, the roller can be disassembled if the soil tillage implement is fitted with the „adjustable coupling parts“ and an AMAZONE hitched seed drill. Without the culti packer roller, the soil tillage implement is supported by the seed drill.

The working depth of the soil tillage implement is adjusted according to para. 7.3 after the culti packer roller is removed. Both depth setting pins (Fig. 12.3/1) must then be inserted and secured into the square plate of the coupling parts.

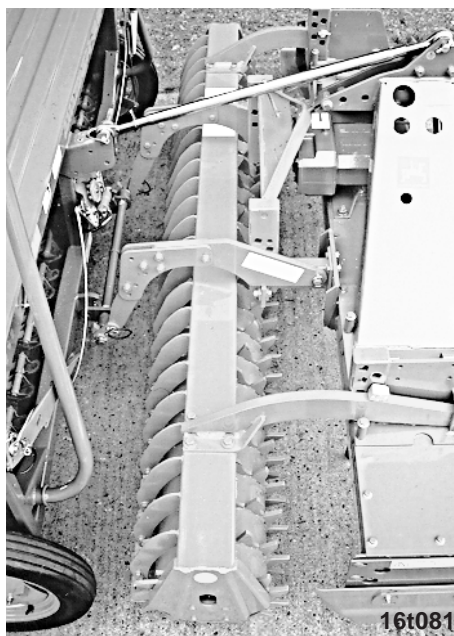


Fig. 12.2



Fig. 12.3



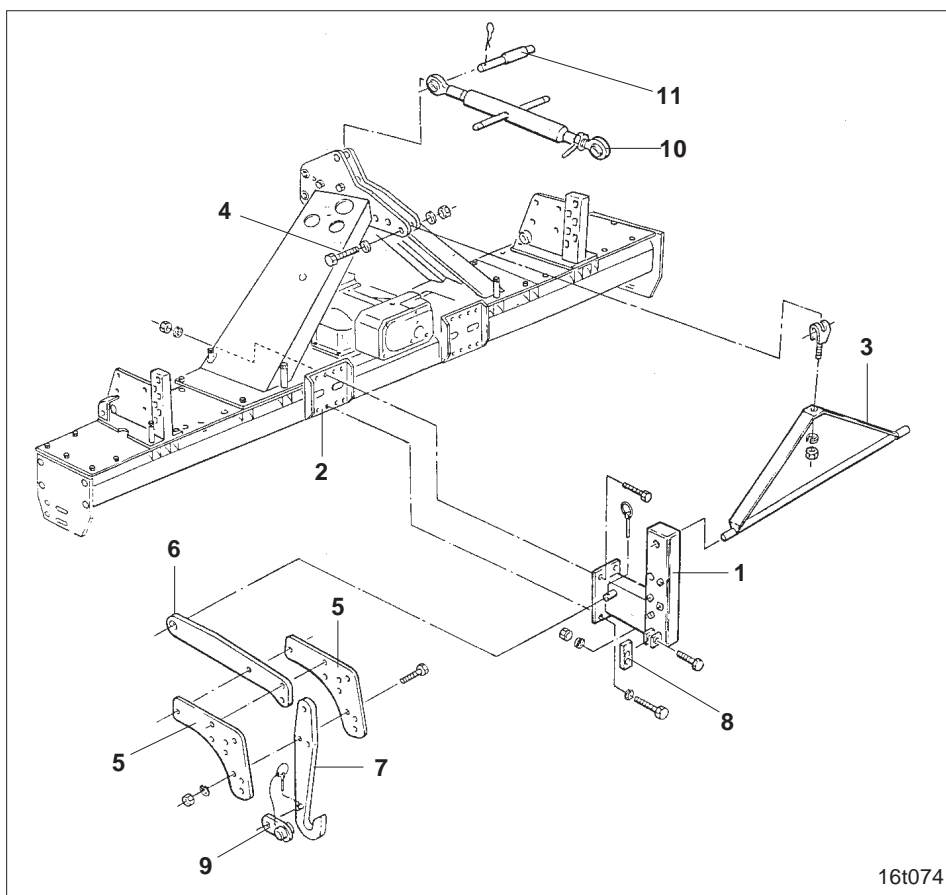
## 12.2 Attaching the “adjustable coupling parts”

The „adjustable coupling parts are available in three models (see para. 12.0). The assembly of the coupling parts is the same for all three cases. However, the assembly parts have different shapes. Fig. 12.4 shows the „adjustable coupling parts“ for soil tillage implements with tooth packer roller PW 420.



**Seed drills can be coupled using the lower link arms of cat. II. The supports (Fig. 12.4/1) must be interchanged when attaching seed drills of cat. I.**

- Attach the supports (Fig. 12.4/1) to the right- and left hand plates (Fig. 12.4/2) of the soil tillage implement (see also Fig. 12.5). Also immediately attach the tensioning frame (Fig. 12.4/3) between the support brackets.



16t074

**Fig. 12.4**



- Attach the tensioning frame to the upper coupling point of the soil tillage implement using the hex. bolt M 20 x 100 (Fig. 12.4/4).
- Attach the adjusting plates (Fig. 12.4/5) to the lower link arm (Fig. 12.4/6).
- Attach the catch hooks (Fig. 12.4/7) so that the following seed drill can be coupled as closely as possible behind the roller. The following settings are possible:
  - 1) Settings for combinations with tooth packer roller PW 420 and support roller SW according to Fig. 12.7.
  - 2) Settings for combinations with tooth packer roller PW 500 according to Fig. 12.8.
  - 3) Settings for combinations with tyre packer roller according to Fig. 12.10



**The figures (Fig. 12.7, Fig. 12.8 and Fig. 12.10) do not show all setting possibilities.**

**In any case it has to be ensured that each catch hook (Fig. 12.4/7) is attached with at least two hex. bolts onto the adjusting plates (Fig. 12.4/5).**



Fig. 12.5

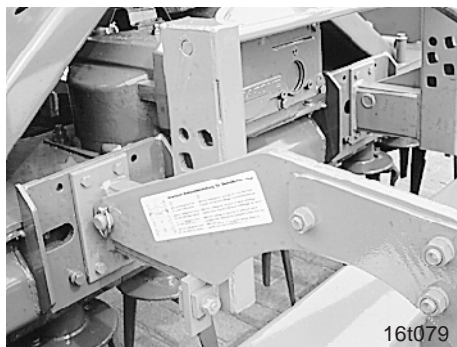


Fig. 12.6

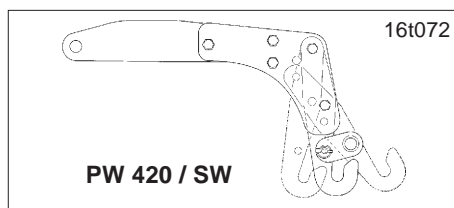


Fig. 12.7

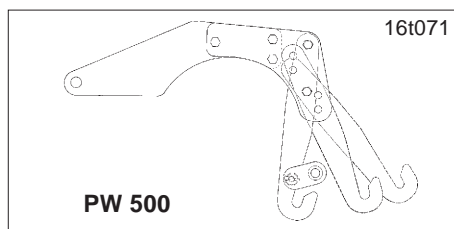


Fig. 12.8



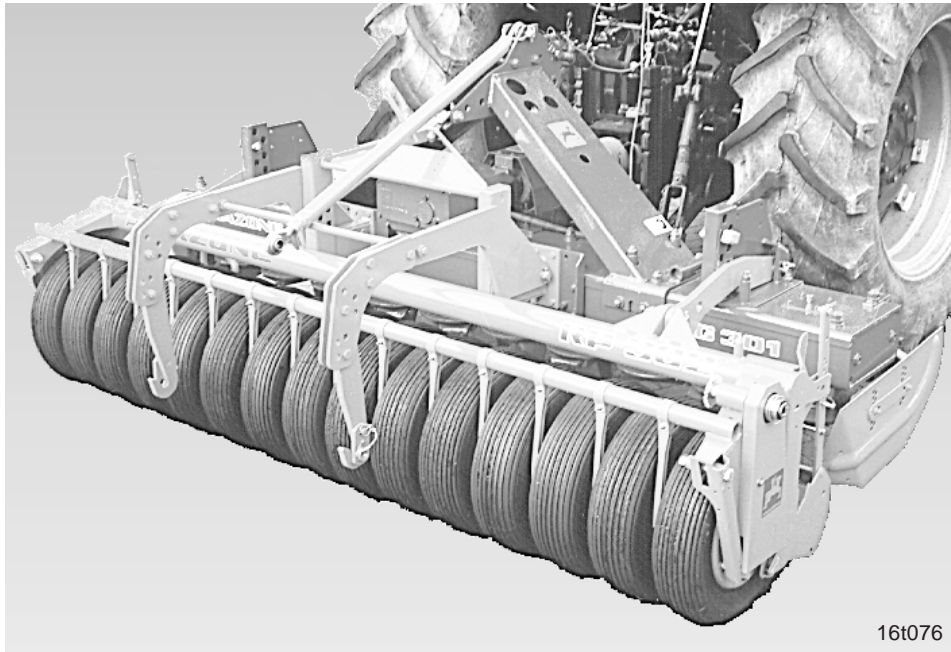


Fig. 12.9

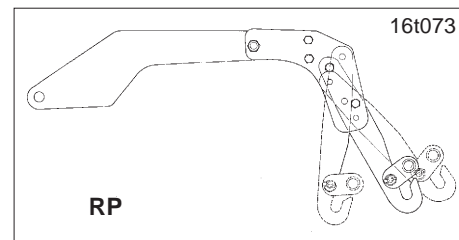


Fig. 12.10







### 13.0 AMAZONE-System "Liftpack" (Option)

AMAZONE-hitched seed drills can be attached to the soil tillage implement using the "adjustable coupling parts" or the **AMAZONE-System "Liftpack"**. If the lifting power of the tractor is not sufficient to raise the combination of soil tillage implement, roller and hitched seed drill using the "adjustable coupling parts", the lifting power requirement can be considerably reduced by using the **AMAZONE-System "Liftpack"** (Fig. 13.1).

The AMAZONE-System "Liftpack" is available in two models with the names A-S "Liftpack 2" and A-S "Liftpack 3". The maximum attachment load of A-S "Liftpack 2" is 1400 kg. For attachment loads of more than 1400 kg the soil tillage implement has to be equipped with the A-S "Liftpack 3"-system.



**Do not exceed the permitted attachment load of the lifting frame!**

For transport and when turning at the headlands, the seed drill is raised above the packer roller (Fig. 13.2). The lift frame is operated with a single acting control valve in the tractor cab.

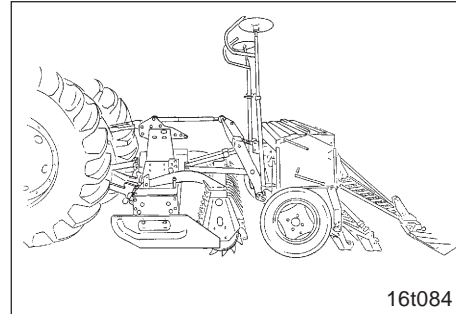


Fig. 13.1

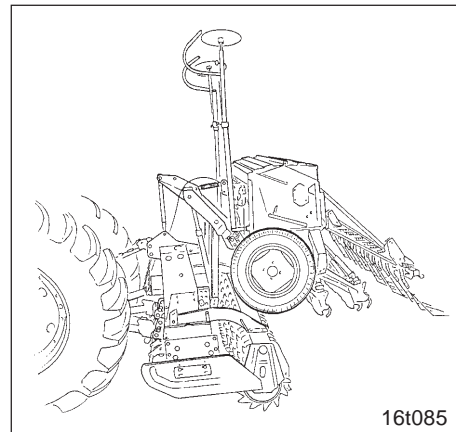


Fig. 13.2



1. -risk of injury on movable parts when raising the lifting frame!
2. Do not operate the hydraulic lifting frame if there are persons in its immediate vicinity!
3. Staying under the raised combination is prohibited!



**It is advisable to connect the hydraulic rams of the lifting frame to the oil circulation system of the tractor's lower link arms. For this purpose, the tractor must be fitted with an additional hydraulic coupling. The hydraulic coupling must be attached to one of the tractor's hydraulic hoses which leads to the lifting rams of the tractor's lower link arms.**

If the lever normally used to raise the tractor's lower link arms is now actuated from the operator's seat, the oil first flows into the lifting rams of the lifting frame which lifts the seed drill over the culti packer roller. The tractor's lower link arms only move and raise the entire combination from the ground with a now reduced lifting power requirement when the lifting rams of the lifting frame have filled with oil and the seed drill has been raised to above the culti packer roller.

The seed drill coulters are now so far from the ground that the implement can be turned without the coulters coming into contact with the ground. For this reason the soil tillage implement must be raised only slightly until the tines of the soil tillage implement and the roller are slightly above ground level (see also para. 13.5.2 – Restricting the lifting height of the tractor's lower link arms). In this position, the universal joint shaft of most tractors is angled only slightly so that it is possible to turn without switching off the universal joint shaft.

After the implement has been turned, the entire combination first lowers and then the soil tillage implement begins working. As the tractor begins to advance, the seed drill begins sowing at the point where the soil tillage implement began to work. This resul-

ts in narrower headlands.

### 13.1 Attaching A-S "Liftpack 2"

The lifting frame is pre-assembled at the factory and is attached to the soil tillage implement as follows:

- Attach the lifting frame (Fig. 13.3/1) to a hoist.
- Bolt the plates (Fig. 13.3/2) of the lifting frame to the plates (Fig. 13.3/3) of the soil tillage implement using each 5 hex. bolts.
- Attach the top link (Fig. 13.3/4) to the upper three-point of the soil tillage implement using a pin (Fig. 13.3/5) and secure using a linch pin.
- The lifting height unit (option) is fitted according to para. 13.5.1.
- Connect the pre-assembled hydraulic hose (Fig. 13.3/6) to both hydraulic rams (Fig. 13.3/7) and attach it to the soil tillage implement using cable clamps.
- Connect the coupling plug (Fig. 13.3/8) on the tractor to a single acting control valve (please also refer to note in para. 13.0). Pressurise the lifting frame by activating the control valve in the tractor cabin and check the hydraulic system for leaks. If necessary eliminate any existing leaks.



**Before activating the control valve in the tractor cabin make sure that no persons are in the immediate vicinity!**

**Risk of injury on moving parts!**

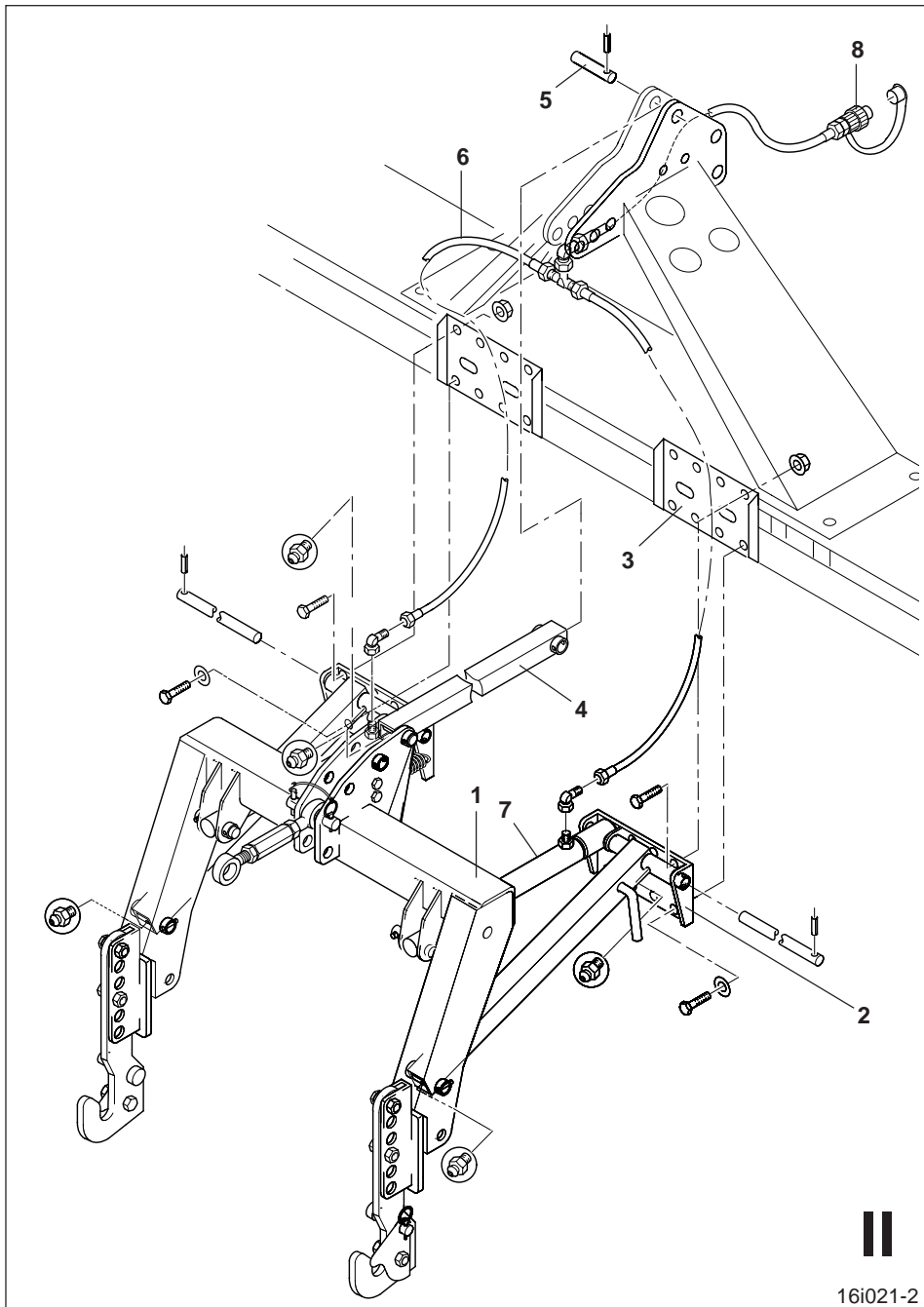


Fig. 13.3



### 13.2 Attaching A-S “Liftpack 3”

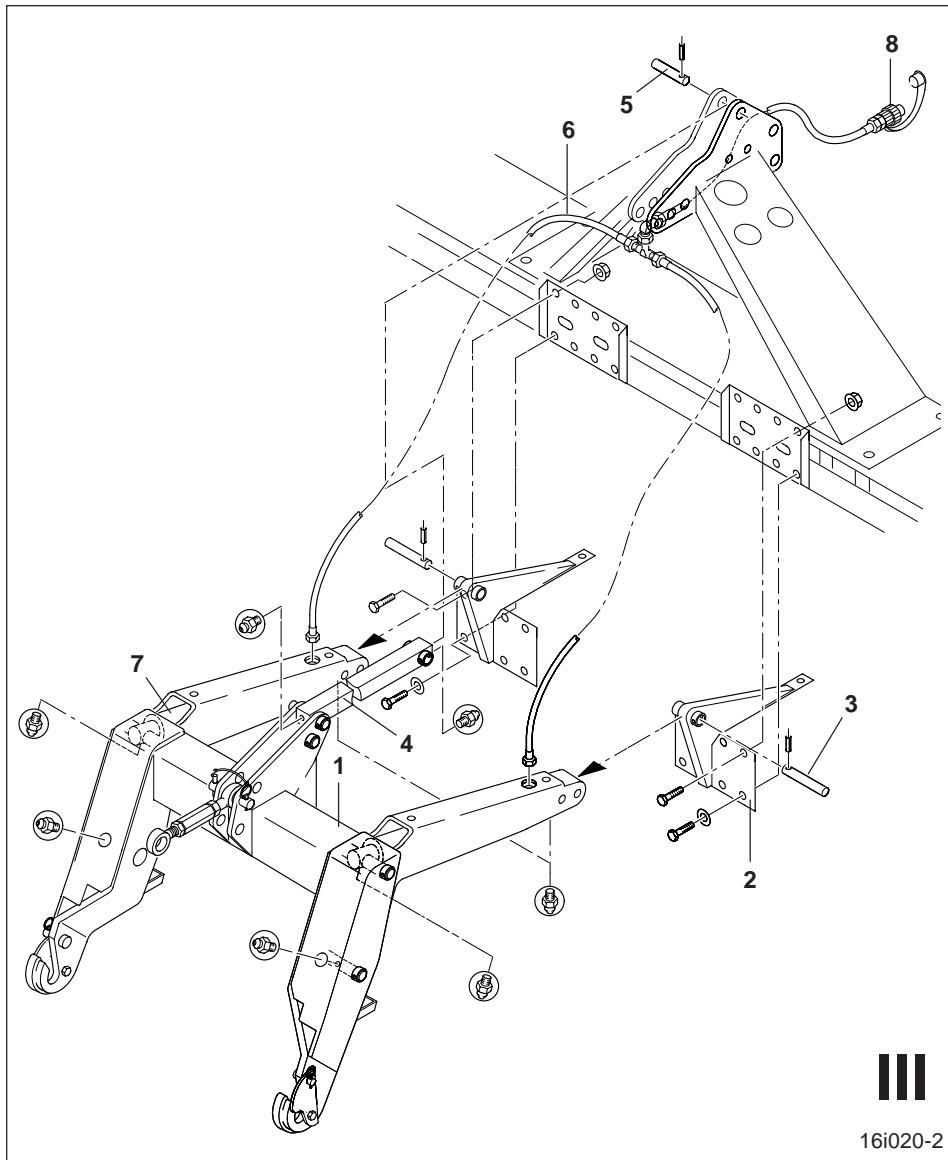
The lifting frame is pre-assembled at factory and is attached to the soil tillage implement as follows:

- Bolt the console (Fig. 13.4/2) to the soil tillage implement.
  - Attach the lifting frame (Fig. 13.4/1) to a hoist.
  - Attach the lifting frame to the consoles (Fig. 13.4/2) by using pins (Fig. 13.4/3) and secure with tensioning pins..
  - Attach the upper link (Fig. 13.4/4) to the upper three point of the soil tillage implement by using a pin (Fig. 13.4/5) and secure by using a tensioning pin.
  - The lifting height limit unit (option) is fitted according to para. 13.5.1
- Connect the pre-assembled hydraulic hose (Fig. 13.4/6) to the two hydraulic rams (Fig. 13.4/7) and attach to the soil tillage implement by using cable clamps.
  - Connect the coupling plug (Fig. 13.4/8) on the tractor to a single acting control valve (please also refer to note in para. 13.0) and pressurise by activating a control valve in the tractor cabin. Check the hydraulic system for leaks and eliminate any leaks if necessary.



**Before activating the control valve in the tractor cabin make sure that no persons are in the immediate vicinity!**

**Risk of injury on movable parts!**



16i020-2

Fig. 13.4



### 13.3 Coupling the seed drill

- Drive with the soil tillage implement towards the seed drill. Seed drills equipped with lower link points of the cat. II can be coupled. After coupling has been completed, slide the securing plates (Fig. 13.5/19 ONTO THE PINS 8Fig: 13.5/2) of the lower link arms and secure each securing plate by using a pin (Fig. 13.5/3) and secure in place by using a linch pin.
- Connect the short top link (200 to 260 mm - Fig. 13.5/4) to the upper coupling point of the seed drill and to the lifting frame using the pin  $\varnothing 25 \times 100$  mm (Fig. 13.5/5). Secure the pin in place by using a linch pin and align the seed drill.



**Please check to ensure that parts of the AMAZONE "Liftpack" system do not collide with the rear window of the tractor when the window is open. If parts could come into contact with the window, the window should not be fully opened.**

### 13.4 Road transport

For road transport raise the seed drill and secure the lift frame against unintended lowering by using two pins (Fig. 13.6/1) and secure by using linch pins (Fig. 13.6/2). During operation, the pins (Fig. 13.6/3) can be fixed on the lifting frame.

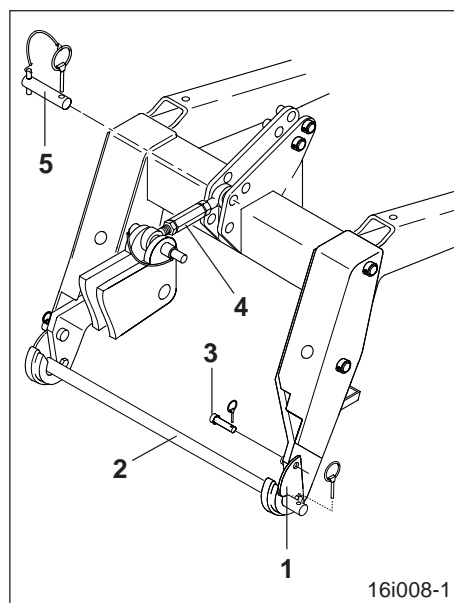


Fig. 13.5

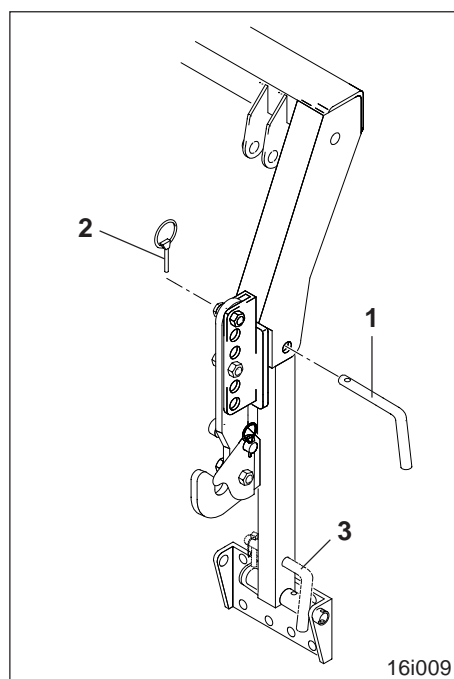


Fig. 13.6



### 13.5 Restricting the lifting height of the Precision Seeder AIRPLANTER

If the soil tillage implement is used in combination with a pto-shaft-driven seed drill, e. g. with a precision seeder AIRPLANTER, it is advisable to limit the lifting height of the lifting frame so that the pto shaft between the soil tillage implement and the AIRPLANTER can continue to run on raised combination without being damaged, e. g. when turning at the headlands.

Since the pto-shaft continues to run while turning at the headlands, the precision seeder continues to function. This means that the pto shaft no longer has to be switched off; thus there is no pressure drop in the precision seeder and seeds do not drop from the metering disc.

By fitting a lifting height limiting valve (Fig. 13.7/1) the lifting height of the lifting frame can be restricted (please also refer to para. 13.5.2, restricting the lifting height of the tractor lower links).

When the seed drill is raised by the lifting frame, the top link (Fig. 13.8/1) pushed against the pin (Fig. 13.8/2) and closes the valve (Fig. 13.8/3) that interrupts the flow of oil to the rams.

The lifting height of the seed drill can be adjusted. To set the lifting height, insert the pin (Fig. 13.7/2) into the applicable bore of the U-bow (Fig. 13.7/3) and secure it in place by using a linch pin (Fig. 13.7/4).

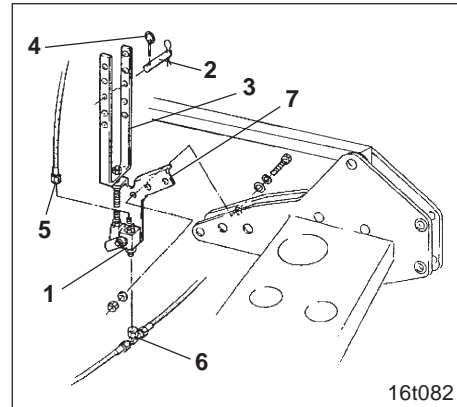


Fig. 13.7

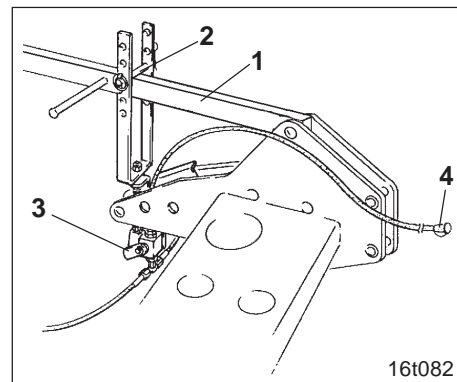


Fig. 13.8

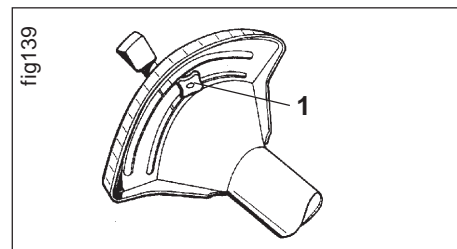


Fig. 13.9



**1. Do not touch the stop used to restrict the lifting height when the lifting frame is being raised. Do not activate the hydraulic lifting frame if there are persons in the immediate vicinity!**



2. **For road transport the pin (Fig. 13.8/2) must be removed so that the seed drill can be fully raised by the lifting frame.**

#### **13.5.1 Assembling the lifting height limiting unit**

- Lower the lifting frame, depressurise the hydraulic system and pull the hydraulic hose leading to the hydraulic rams off the tractor plug.



**The hydraulic system is under high pressure! Depressurise the hydraulic system of the lifting frame before commencing work.**

- As soon as the hydraulic system has been depressurised, disconnect the hydraulic hose (Fig. 13.7/5) on the T-joint (Fig. 13.7/6).
- Bolt the valve carrier (Fig. 13.7/7) to the upper link point of the soil tillage implement.
- Attach T-joint (Fig. 13.7/6) and hydraulic hose (Fig. 13.7/5) to the valve (Fig. 13.7/1).
- Guide the hydraulic hose (Fig. 13.7/5) to the tractor and connect with a single acting control valve. By activating the control valve in the tractor cabin, pressurise the lifting frame and check the hydraulic system for leaks. If necessary eliminate any leaks



**Before activating the control valve in the tractor cabin make sure that no persons are in the immediate vicinity!**

**Risk of injury on movable parts!**

#### **13.5.2 Restricting the lifting height of the tractor's lower link arms**

If the soil tillage implement, e. g. in combination with a precision air seeder, is to continue running when turning at the headlands, the universal joint shaft between the tractor and the soil tillage implement may be angled only slightly. To prevent the angle of the universal joint shaft from becoming too big, the soil tillage implement should only be raised so far that its tines are just above the surface of the soil. Many tractors satisfy these requirements, so that the soil tillage implement can continue to run even when turning.

To ensure that the shallow lifting height of the soil tillage implement is not exceeded, it is vital to use the lifting height limiting unit (Fig. 13.9) on the control lever for the tractor's lower link arms. Generally, there is an adjustable lock (Fig. 13.9/1) on the scale next to the control lever for the tractor's lower link arms. This lock must be set so that the rotary cultivator does not exceed the desired shallow lifting height.





## 14.0 Levelling rod (option)

The levelling rod (Fig. 14.1/1) eliminates prevailing soil undulations, e. g. in front of the wedge ring roller (Fig. 14.1/2). Remaining clods on extremely heavy soils are crumbled.

The levelling rod eliminates the danger, that, e. g. the tooth packer roller comes to a standstill on extremely loose, dry and light soils.

The levelling rod pre-compacts loose soil and the slip of the tooth packer roller is reduced.

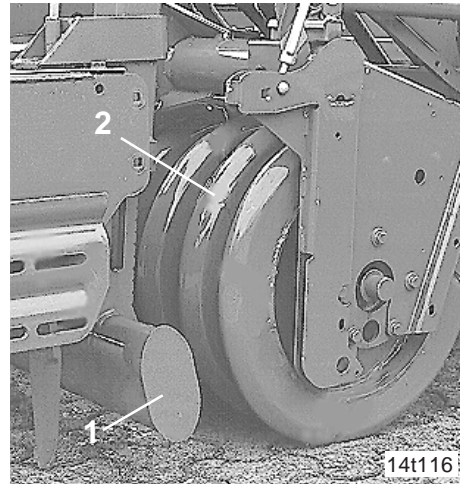


Fig. 14.1

### 14.1 Bringing the levelling rod into working position

Set the levelling rod by using the two cranks (Fig. 14.2/1) in such a way that the earth ridges cover the levelling rod half way.

After setting, secure the cranks (Fig. 14.2/1) by using a hinge pin (Fig. 14.2/2) to prevent the levelling rod moving out of place during operation.

### 14.2 Putting out of operation

Crank the levelling rod upwards if not needed, raise on the handle (Fig. 14.3/6) and lock the spindle guide tube (Fig. 14.3/3) in the lower hole (Fig. 14.3/10). Secure the pin after any inserting.

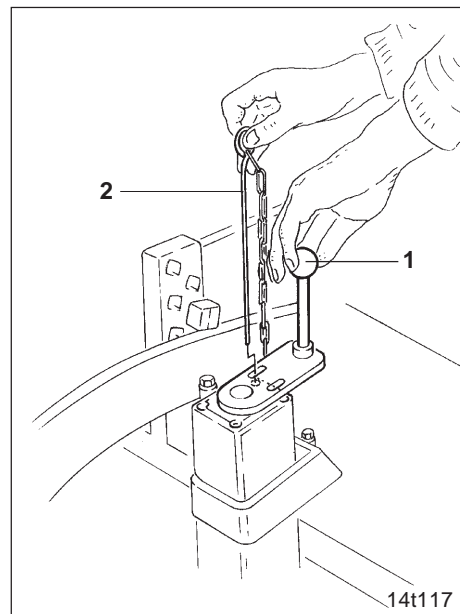


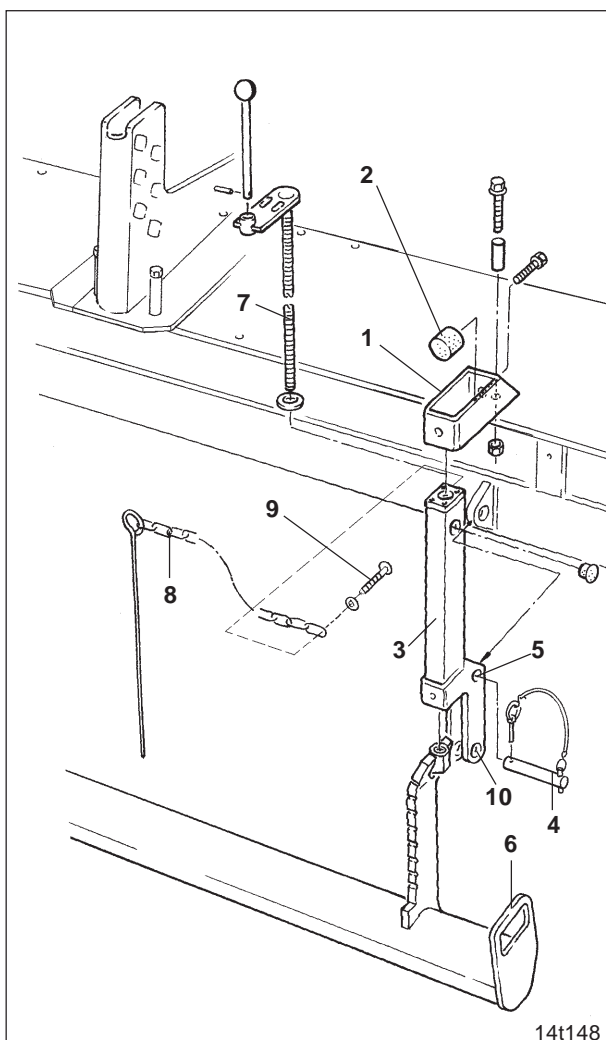
Fig. 14.2



### 14.3 Fitting the levelling rod

Bolt two consoles (Fig. 14.3/1), equipped with rubber buffers (Fig. 14.3/2) to the soil tillage implement.

- Lock the spindle guide tubes (Fig. 14.3/3) by using pins (Fig. 14.3/4) and secure by using linch pins. During operation lock the spindle guide tubes in the upper hole (Fig. 14.3/5) (please also refer to para. 14.2).
- Raise the levelling rod on its handle (Fig. 14.3/6) and insert setting spindle (Fig. 14.3/7).
- Bolt the chain (Fig. 14.3/8) by using a drilling screw (Fig. 14.3/9) onto the spindle guide tube.



14t148

**Fig. 14.3**



### 15.0 Tractor wheel mark eradicators (option)

Tractors with narrow tyres often leave deep wheel marks in unpacked soil. The soil tillage implement can be used at shallower working depth when these deep marks are first removed by the wheel mark eradicators (option).



**Before you bring the wheel mark eradicator tines in working position, raise the soil tillage implement using the tractor's hydraulic system. Lock the wheel mark eradicator tines at the top position before you disengage the soil tillage implement to prevent damage to**

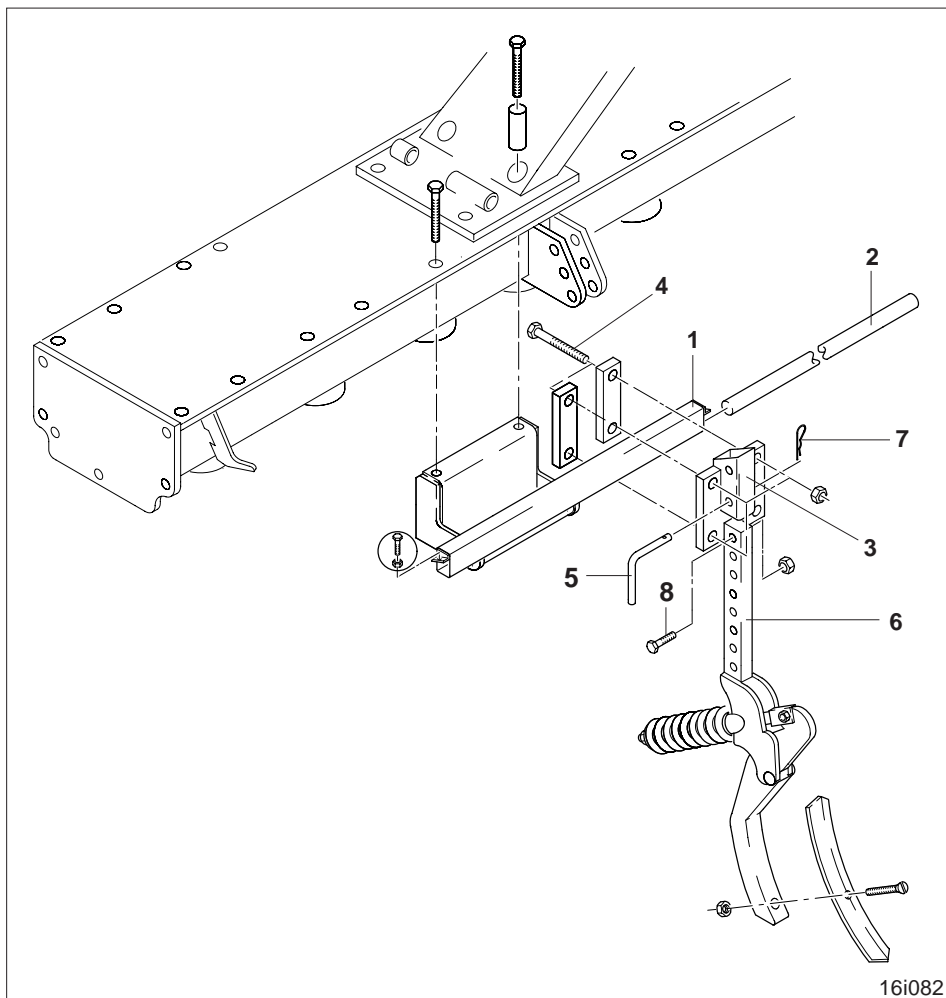


Fig. 15.1



the wheel mark eradicators.



**If the wheel mark eradicators are to be removed, the support tube (Fig. 15.1/1) and the protective tube (Fig. 15.1/2) must remain on the soil tillage implement of the soil tillage implement must be equipped with guarding bars (Fig. 15.2)! The soil tillage implement must not be put into operation without guarding bars!**

## 15.2 Settings when work is finished

Before parking your soil tillage implement, lock the wheel mark eradicator tines (Fig. 15.1/6) at the top position of the support (Fig. 15.1/3) to prevent damage to the wheel mark eradicator tines.

## 15.1 Settings before working in the field

When delivered, two wheel mark eradicators (Fig. 15.1) are attached to the soil tillage implement.

Only bring the wheel mark eradicators into the working position just before starting work in the field:

- Raise the soil tillage implement slightly using the tractor's hydraulic system.
- Push the support (Fig. 15.1/3) on the support tube (Fig. 15.1/1) into the correct position (tractor track). First loosen the hex bolts (Fig. 15.1/4) and retighten them firmly when work is finished.
- The working depth of the wheel mark eradicator tines can be adjusted. To adjust the working depth, the pin (Fig. 15.1/5) is to be inserted into the required hole in the support (Fig. 15.1/3) and in the wheel mark eradicator tines (Fig. 15.1/6) and secured in place using a spring clip pin (Fig. 15.1/7).



**The safety bolt (Fig. 15.1/8) prevents the wheel mark eradicator tines from falling through the support clip (Fig. 15.1/3) and getting lost if the pin (Fig. 15.1/5) should loosen.**



### 15.3 Fitting the wheel mark eradicators

Remove the guarding bars (Fig. 15.2) attached to the soil tillage implement near the tractor tyres.

Remove the protective supports (Fig. 15.2/1) from the protective tubes (Fig. 15.2/2) and push the protective tubes (Fig. 15.3/4) into the support tubes (Fig. 15.3/1) and slightly tighten each tube using each two hex. bolts (Fig. 13.3/2).

Fig. 15.3/1 shows the fitting of the right hand support tube as seen in driving direction.

Connect each support tube (Fig. 15.3/1) to the soil tillage implement using two lid-fastening bolts (Fig. 15.3/3). First replace the existing lid-fastening bolts (Fig. 15.3/3) by the supplied longer hex. bolts.

To protect against the rotating soil tilling tines, the protective tubes (Fig. 15.3/4) are to be aligned accordingly in the appropriate support tubes (Fig. 15.3/1) and tightened using two hex. bolts each (Fig. 15.3/2).

Connect the wheel mark ericator tines (Fig. 15.1/6) with the holder (Fig. 15.1/3) according to para. 15.1.

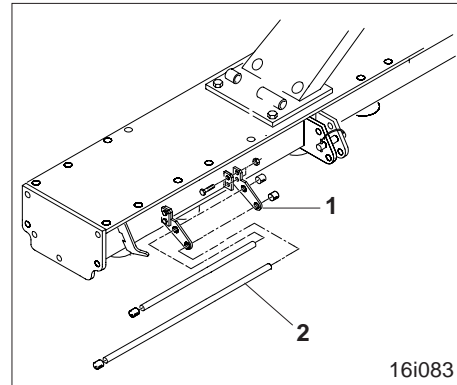


Fig. 15.2

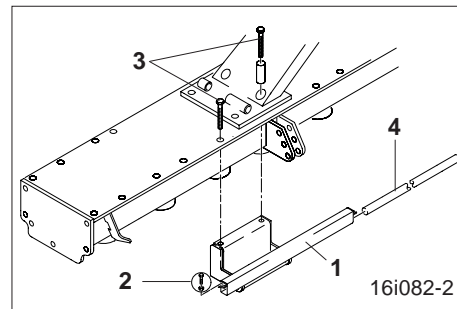


Fig. 15.3

15 - 4

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## 18.0 Transport on public roads

When travelling on public roads, the tractor and the soil tillage implement or the till- and drill combination must comply with your national traffic regulations. The owner and operator of the vehicle are responsible for conforming with the legal requirements stipulated by national traffic regulations. The following points must be observed:

1. The maximum permissible speed.
2. The maximum permissible axle loads and laden weights!  
The tractor's front axle load must be at least 20 % of the tractor's unladen weight when transporting the implement or the combination. Otherwise, the tractor's steering is detrimentally affected. If necessary, weights must be attached to the front of the vehicle. The permissible load on the tractor's rear axle must not be exceeded.
3. The permissible transport width! The transport width must not exceed 3 m.
4. Riding and transporting objects on the implement is forbidden!
5. The vehicle's driving, steering and braking behaviour is affected by attached implement and ballast weights. It must be ensured that the vehicle steers and brakes correctly.
6. On curves, take the wide load and balance weight of the implement into account.
7. Check and attach any equipment needed for transport such as lights, warning devices and protective guards:
  - Attach red/white striped warning plates to the front (Fig. 18.1/1) and rear (Fig. 18.2/1) of towed/carried implement. The distance of the upper edge of the warning plates and the road must not exceed 1.5 m. Do not attach the warning plates at a distance big-

ger than 10 cm from the outer edge of the implement.

- The tractor's lights must not be covered when transporting the soil tillage implement without a seed drill.
- If the soil tillage implement is supported with a seed drill, legally approved detachable lights must be attached to the light carriers of the seed drill; the front light must be attached high up and the rear lights low down. Fig. 18.2/2 shows the permanently attached lights that remain mounted when the machine is used in the field. These lights also include two rear lamps (Fig. 18.2/4) and two rear lamps (Fig. 18.2/4) and two reflectors that must be mounted on the tines of the exact harrow.
- The tines of the exact harrow, protruding to the rear, must be covered by the traffic safety guard (Fig. 18.2/3) (option).

For transport, raise the seed drill only far enough that the following distances are not exceeded:

Upper edge of rear lights to road:

max. distance. 1550 mm,

Rear reflectors to road:

max. distance. 900 mm.

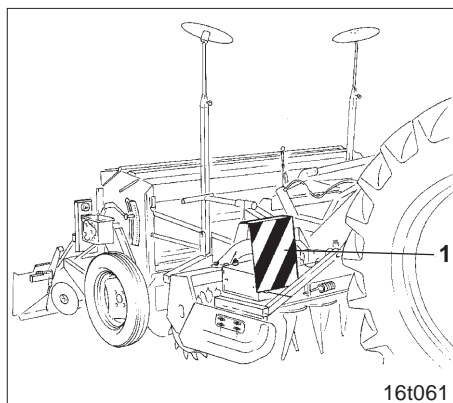
Further information regarding transport of the seed drill can be found in the operating instruction for the seed drill!

8. Check that all lights are functioning correctly before taking the vehicle onto the road.
9. When driving on roads with raised implement, the operating lever must be locked to prevent lowering.
10. When the implement is in its transport position, always ensure that any excessive lateral movement of the tractor's three-point link arm is prevented.

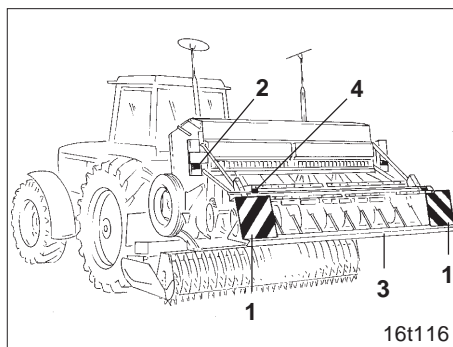


11. The release cables for quick-release couplings must hang loosely. These couplings must not be activated when the implement is in its lowered position.
12. The lifting frame (if present) on the AMAZON "Liftpack II" system is to be secured using two pins according to para. 13.4.

**Please observe these notes. They are intended to help prevent accidents on public roads.**



**Fig. 18.1**



**Fig. 18.2**





## 19.0 Maintenance - Repairs



**Observe the safety advice!**

### 19.1 Bolt connections

Check all bolt connections after the first 10 operating hours and tighten, if necessary.

### 19.2 Checking the oil level in the transmission

The oil level in the transmission must always be checked when the implement is in a horizontal position:

#### Exchange gear main gearbox:

The oil film on the oil dip stick (Fig. 19.1/1) must be visible below the "max."-mark.

If necessary, add gear oil (see table on pages 19 - 2) through the opening channel for the oil dip stick (Fig. 19.1/1).

#### Two-speed shift main gearbox:

The oil level must be visible in the oil level gauge window (Fig. 19.2/1).

If necessary add gear oil (see table pages 19 - 2) through the oil channel of the breather screw (Fig. 19.2/2).

#### Three-speed shift main gearbox:

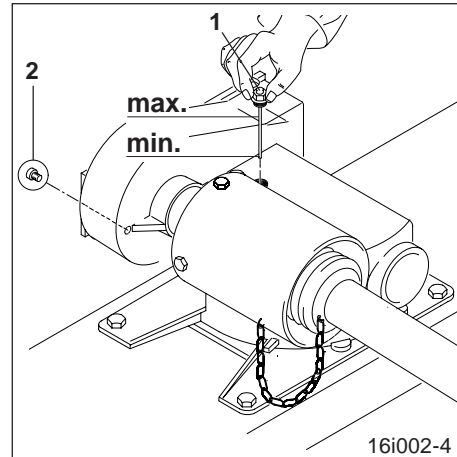
An oil check is not necessary. After a possible repair, gear oil (see table page 19 - 2) has to be filled in through the opening channel of the breather screw (Fig. 19.3/2).



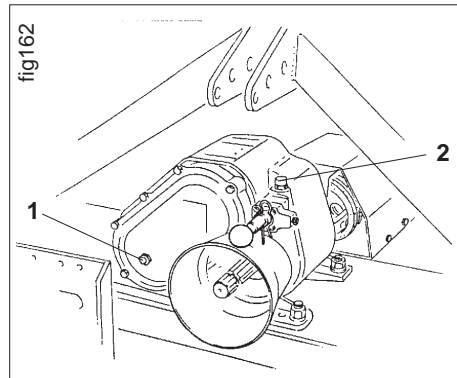
**When adding gear oil, ensure that it is clean and that during filling no dirt gets into the gearbox housing. Always check oil dip stick and breather screw for firm seating.**



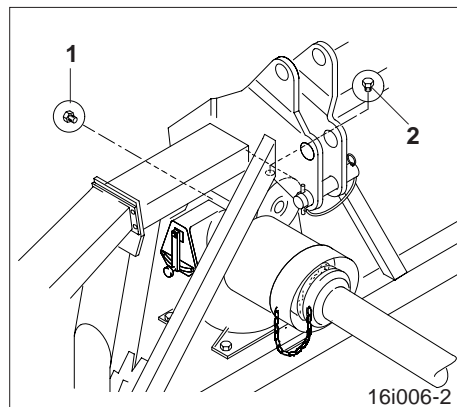
**The exchange gear main gearbox is provided with an oil dip stick**



**Fig. 19.1**



**Fig. 19.2**



**Fig. 19.3**



(Fig. 19.1/1) with ventilation.

The two-speed and three-speed shift main gearbox are provided with a breather screw (Figl. 19.2/2 and 19.3/2).

Ventilation must always be provided; otherwise, the transmission may become leaky!

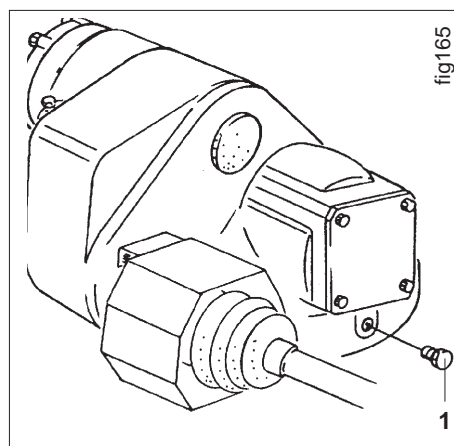


Fig. 19.4



### 19.3 Changing the gear oil

#### Gear oil change

first after 50 operating hours,  
then every 400 operating hours.  
Add new gear oil to the transmission as  
described in para. 19.2.

#### Exchange gear main gearbox:

oil drainage screw (Fig. 19.1/2).

#### Two-speed shift main gearbox:

oil drainage screw (Fig. 19.4/1).

#### Three-speed-shift main gearbox:

oil drainage screw (Fig. 19.3/1).

#### Gear oil types and quantities

| Main gearbox   | Rotary harrow<br>Rotary<br>cultivator               | Quantity<br>main gear box | Gear oil<br>type                   | Part-<br>No. |
|--|---|---------------------------|------------------------------------|--------------|
| Exchange gear main gear box<br>with / without<br>pto shaft through drive | KE/KG 252/3<br>KE/KG 302/3<br>KE/KG 402/3<br>KG 452 | 4,8 l                     | Gear oil<br>85 W-90                | OD007        |
| Two-speed shift main gearbox-  | KE 253<br>KE/KG 302/3<br>KE/KG 402/3<br>KG 452      | 4,8 l                     | Gear oil<br>85 W-90                | OD007        |
| Three-speed shift main<br>gearbox  | KG 602  | 12,0 l                    | Gear oil<br>TITAN RENEP<br>8090 MC | OD047        |

t144gb02



#### 19.4 Checking the oil level in the spur gear housing

The oil level in the spur gear housing is to be checked every 100 operating hours. The teeth of the spur gears must be half covered with gear oil when the soil tillage implement is in a horizontal position. Remove the inspection cover (Fig. 19.5/1) to check the oil level. First loosen the breather tube (Fig. 19.5/2) and afterwards, refasten it using a tube clamp (Fig. 19.5/3). The spur gear housings are filled at the factory with .:

Gear oil: ERSOLAN 460  
Manufacturer: Wintershall.

| Implement   | Filling quantity<br>Spur wheel<br>troughs |
|-------------|---|
| KE/KG 252/3 | 21 l                                      |
| KE/KG 302/3 | 25 l                                      |
| KE/KG 402/3 | 35 l                                      |
| KG 452      | 40 l                                      |
| KG 602      | 50 l                                      |

t144qb03

Changing the oil is not required.

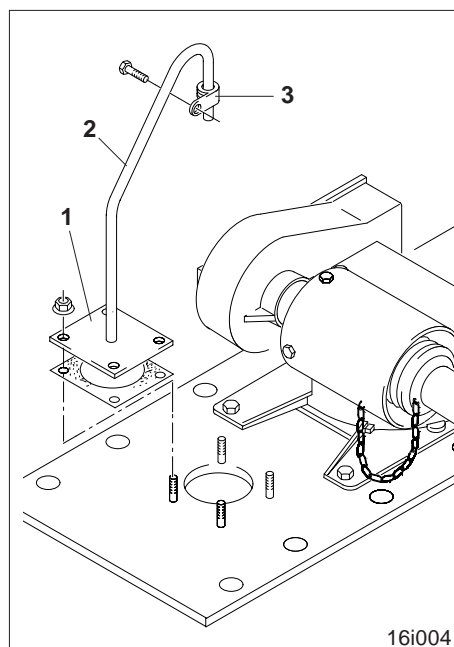


Fig. 19.5



The oil types listed below can be added or used instead of the standard oil if gear oil must be added or exchanged and if ERSOLAN 460 gear oil is not available:

| Manufacturer | Gear oil           |
|--------------|--------------------|
| Wintershall  | ERSOLAN 460        |
| Agip         | Blasia 460         |
| ARAL         | Degol BG 460       |
| Autol        | Precis GEP 460     |
| Avia         | Avilub RSX 460     |
| BP           | Energol GR-XP 460  |
| Castrol      | Alpha SP 460       |
| DEA          | Falcon CLP 460     |
| ESSO         | Spartan EP 460     |
| FINA         | Giran 460          |
| Fuchs        | Renep Compound 110 |
| Mobil        | Mobilgear 634      |
| Shell        | Omala 460          |

t140gb04



**The inspection cover is equipped with a breather tube (Fig. 19.5/2). Ventilation must always be provided to prevent damage!**



**Use only new gear oil after overhauling the soil tillage implement.**



## 19.5 Tines

The tines (Fig. 19.6/1) of the soil tillage implement are made of very tough hardened boron steel. The tines are subject to wear and must be replaced at the latest when they have reached a length of  $L_{min.} = 150 \text{ mm}$  (see Fig. 19.6). At great working depths, the tines must be exchanged earlier to prevent damage or wear of the tool supports (Fig. 19.6/5).



**The manufacturer is not liable for damage caused by stones if the length of the tines drops below the minimum of 150 mm specified by the manufacturer!**

### 19.5.1 Replacing tines



1. Lift the implement using the tractor's hydraulic system and secure it with appropriate support elements!
2. Replace tool tines only if the pto shaft and the motor are switched off and the ignition key has been removed!

The tines (Fig. 19.6/1) are fastened in the pockets of the rotor (Fig. 19.6/5).

- Pull the linch pin (Fig. 19.6/2) out of the pin (Fig. 19.6/3).
- Knock the pin (Fig. 19.6/3) out of the rotor from below.
- Pull the tine (Fig. 19.6/1) out of the tool carrier, exchange them and fix by using (Fig. 19.6/3) and secure by using a linch pin (Fig. 19.6/2).



**The direction of rotation of the tines is different for each tine rotor.**

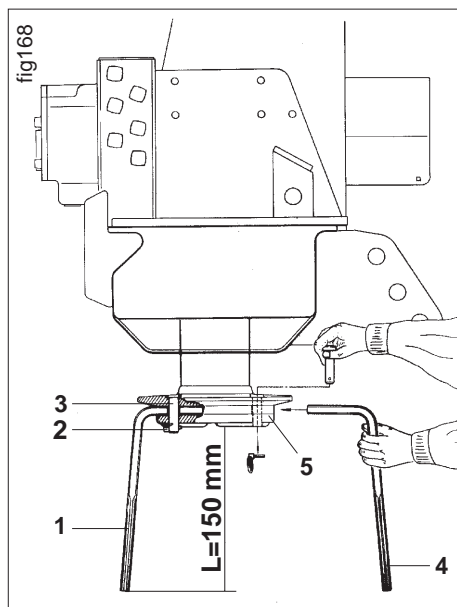


Fig. 19.6



Therefore, the soil tillage implement is equipped with two kinds of tines (for each direction of rotation one kind). The tines must not be interchanged.

The rotor of the outermost left (seen in driving direction) rotates clockwise. The direction of rotation of the tool rotors is shown in Fig. 19.21. The arrows over the rotors show the direction of rotation.

**Rotary harrow tines:**

Fig. 19.7 shows the tines for rotors rotating in clockwise direction.

Fig. 19.8 shows the tines for rotors rotating in counter clockwise direction.

**Rotary cultivator tines:**

Fig. 19.9 shows the tines for rotors rotating in clockwise direction.

Fig. 19.10 shows the tines for rotors rotating in clockwise direction.



The tines of the rotary cultivator are positioned “on grip” if the tines are attached to the rotor as described above. The tines can also be attached in a “pulling” manner to the rotary cultivator, i.e. in the opposite direction of rotation. For this, the tines for the clockwise rotating rotors are to be attached to counter clockwise rotors and vice versa.

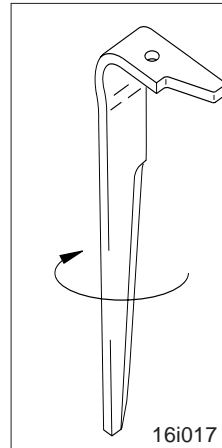


Fig. 19.7

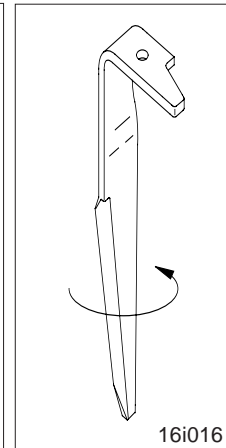


Fig. 19.8

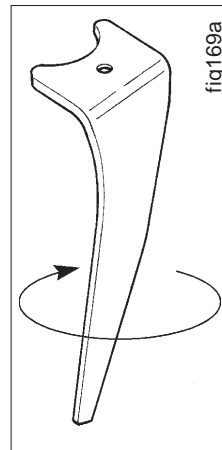


Fig. 19.9

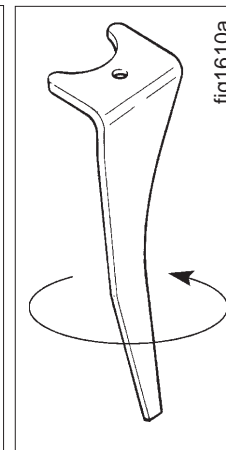


Fig. 19.10



### 19.6 Welding on new tine tips to bring rotary cultivator tines back to their original length

With increasing wear, the rotary cultivator tines can be brought back to the original length using welding tips (Fig. 19.11/1). First remove the tines from the rotor according to para. 19.5.1.

If, in extraordinary cases, the tines are to be lengthened without removing them, the ground must be attached directly to the tines during electric welding to prevent damage of the tine rotor bearings and the transmission.

#### Work procedure

- Hold the tip to be welded (Fig. 19.11/1) to the old tine and make a separation mark (Fig. 19.12/1)
- Separate the old tine at the mark (Fig. 19.12/1).
- Attach the tip to be welded (Fig. 19.12/2) to the tine stump, solder with root of the seam (Fig. 19.12/3) and let the tine cool.
- After the covering layer welding (Fig. 19.12/4) the tine is again ready for use.

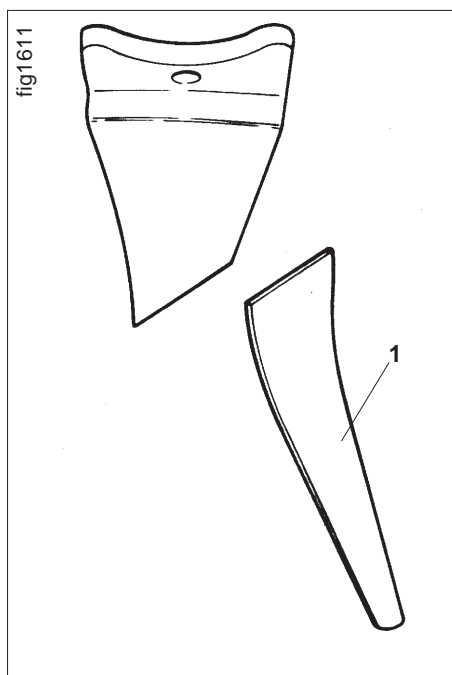


Fig. 19.11

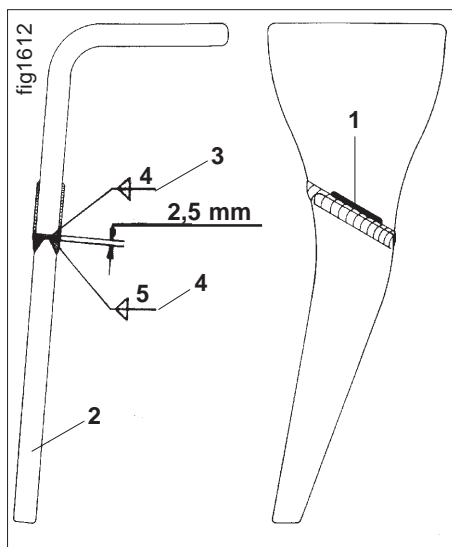


Fig. 19.12





## Materials

### Use

- Wire electrodes for the MAGC/MAGM-welding of non-alloyed, low-alloyed, heat resistant and fine-grained steel, e. g. Union K 52 (Thyssen)..
  
- Bar electrodes labelled:
  - SH black 3 K
  - SH green            K 70
  - SH Ni 2             K 90
  - SH Ni 2             K 100.

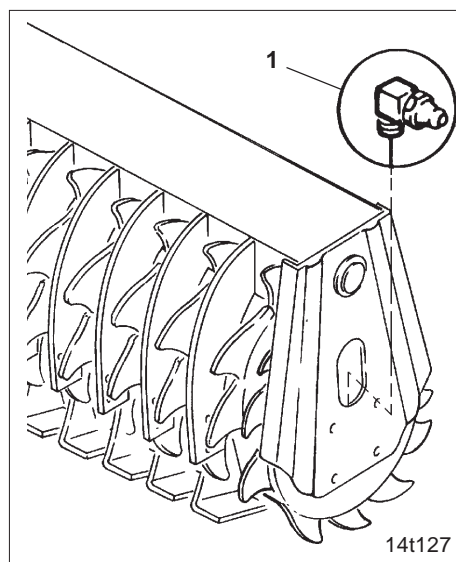


### 19.7 Grease nipples

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 two grease nipples on the axle bearings (Fig. 19.13/1)
- the tooth packer roller
- the support roller
- the tyre packer roller and
- the wedge ring roller.



**Fig. 19.13**



- the 6 and 8 grease nipples (Fig. 19.14) on the lifting frame of the AMAZONE-System "Liftpack".

#### 19.7.1 Greasing plan for the pto shaft

Grease the pto shaft at regular intervals. Please also adhere to the maintenance advice of the pto shaft manufacturer. Grease the guard tubes to prevent jamming caused by sub-zero temperatures.

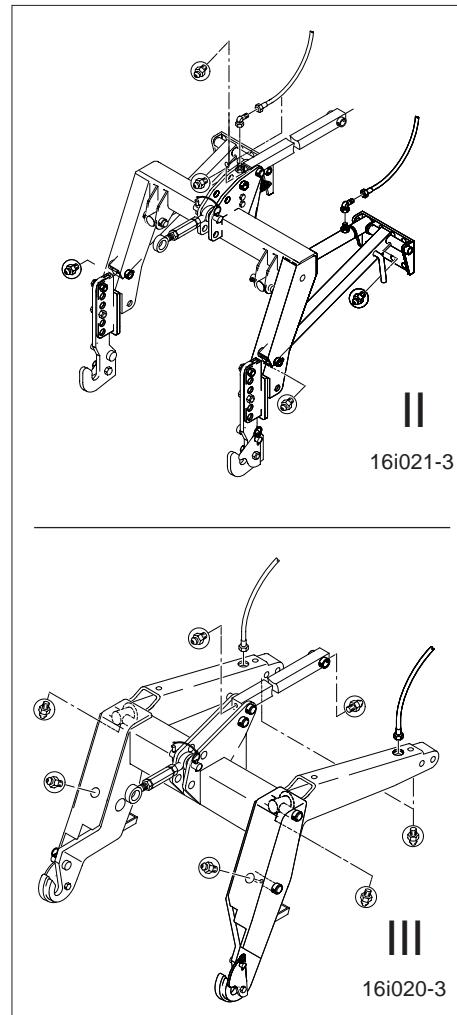


Fig. 19.14



### 19.8 “Airing” the friction clutch EK 96/4

The friction clutch EK 96/4 (Fig. 19.15/1) prevents damage to the gear components caused by stones or other objects that are caught between the tines. **For this reason, the friction clutch must always function correctly.**

The friction clutch is activated irregularly on heavy or stony soils and heats up slightly. It becomes warm to the touch. If this temperature is not reached on stony soil, the clutch must be “aired”. This is also necessary when the soil tillage implement **is used for the first time or if it has not been used for a relatively long period of time**. The following steps must be performed:

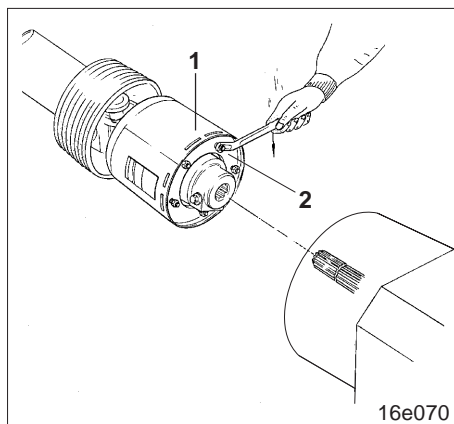


Fig. 19.15



**Observe the safety instructions!**

1. Pull the friction clutch off the pto shaft of the transmission (please see notes provided by the manufacturer of the pto shaft).
2. Tighten all hex nuts (Fig. 19.15/2) completely. This will relieve the strain placed on the friction discs.
3. Couple the clutch to the pto shaft of the transmission and turn it manually or couple it to the tractor and slowly turn it for approx. 10 seconds using the tractor's engine. Doing this will remove any rust or moisture which can cause the clutch discs to stick together.
4. Pull the friction clutch off the pto shaft of the transmission.
5. Turn back all hex. nuts (Fig. 19.15/2) until there is a distance of approx. 5 mm between the nuts and the clutch.
6. The friction clutch can now be used again. Mount the pto shaft to the tractor and to the soil tillage implement.



The friction discs will stick together more frequently if there is a high degree of moisture or dirt or if the implement is cleaned using a high-pressure water jet.!

The soil tillage implement must not be used if the friction clutch has become unusable due to overheating. Only use the implement with a functioning friction clutch!



### 19.8.1 Changing the torque of the friction clutch EK 96/4

The torque at which the friction clutch (Fig. 19.16/1) is activated is set to 1550 Nm at the factory. If this torque is exceeded, the power transmission from the tractor's pto shaft to the soil tillage implement is interrupted. This torque can be changed. For example, if the friction clutch is activated too frequently on very stony soils, the torque can be increased.

On the other hand, if the friction clutch is rarely activated, the torque can be reduced.

The torque is increased when the spring pressure (Fig. 19.17/2) is increased. The spring pressure is adjusted by means of an adjusting disc (Fig. 19.17/3). The adjusting disc (Fig. 19.17/4) is installed in the housing of the friction clutch. The adjusting disc (Fig. 19.17/4) can be inserted into the housing in the four positions "A" to "D" (see Fig. 19.17). The adjusting disc is positioned in the housing with either face "R1" or "R2" facing outwards into the housing openings G 1 or G 2 (see table).

As a standard setting, the adjusting disc is in position "C" for a torque of 1550 Nm. The adjusting disc (Fig. 19.17/5) is installed in the housing openings in position G 2.

To increase the torque, e. g. from 1550 Nm to 1700 Nm, the adjusting disc must be installed as shown in position "D":

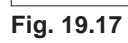
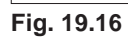


#### Observe the safety advice!

- Pull the friction clutch off the pto shaft of the transmission.
- Tighten all hex. nuts (Fig. 19.16/2) completely.
- Remove the adjusting ring (Fig. 19.17/4) and reinstall in the correct position (see table) in the housing of the friction clutch. The example requires that the adjusting disc (Fig. 19.17/5) must be set to position "D" and installed in housing opening G 2
- Turn back all hex nuts (Fig. 19.16/2) until there is a distance of approx. 5 mm between the nuts and the disc (Fig. 19.16/3).
- Mount the pto shaft to the tractor and to the soil tillage implement.

| Position | Torque  | Position of the disc | Install on opening |
|----------|---------|----------------------|--------------------|
|          |         |                      |                    |
| A        | 1200 Nm | R 2 facing outwards  | G 1                |
| B        | 1380 Nm | R 1 facing outwards  | G 1                |
| C        | 1550 Nm | R 2 facing outwards  | G 2                |
| D        | 1700 Nm | R 1 facing outwards  | G 2                |

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## 19.9 Overload clutch with Cam wheel clutch Walterscheid EK 64/2R

### 19.9.1 Function

Should the tines come to a standstill due to the cam clutch being deactivated (Fig. 19.18/1) stop and reduce the pto shaft speed of the tractor to approx. 300 R.P.M. until the cam clutch engages audibly. Should the tines do not begin to rotate, disengage the pto shaft and remove the obstacle (only with stopped engine and removed ignition key). The cam wheel clutch is then immediately ready for use.

### 19.9.2 Fitting

Attach the pto shaft half with the overload clutch to the gearbox input shaft of the implement and secure by using a cone bolt (Fig. 19.18/5) (CC-locking). The torque of the cone bolt (Fig. 19.18/5) is 80 Nm (please refer to the hints of the pro shaft manufacturer). Regularly check the cone bolt for firm seating.

### 19.9.3 Setting the torque

In the factory the overload clutch has been set to a torque of 2000 Nm (KE/KG less than 6 m working width) or to a torque of 2900 Nm (KG with 6 m working width), which should not be changed.

It is recommended to operate the implement with a pto shaft speed of 1000 R.P.M. Set the tractor pto shaft speed to 1000 R.P.M. if you operate with a tractor pto shaft speed of 540 R.P.M. and the overload clutch engages too often.

Extraordinary operating conditions (e. g. many stones in the soil) may require to change the torque on the overload clutch even at 1000 R.P.M. tractor pto shaft speed.

If the safety device engages too often or not at all, the torque of the overload clutch can

be adjusted higher or reduced. For this pull the overload clutch off the gearbox input shaft. Remove seal ring (Fig. 19.18/2), securing ring (Fig. 19.18/3), coupling hub (Fig. 19.18/6) and spring assembly (Fig. 19.18/9). Measure the spring wire diameter „D“ (Fig. 19/18) and take from the table (Fig. 19/18a) the figure which corresponds to a change of the spring assembly length of 1 mm.

Remove the expansion pins (Fig. 19.18/11) and

- reduce the torque by equal increase
  - increase the torque by equal decrease
- of the setting measure „L“ on both sides of the spring assembly (Fig. 19.18/9).



1. **The shortest permissible spring assembly length (see table Fig. 19.18a) must not be undercut in order to exclude clutch blockages**
2. **Always set the same spacings ( =, see Fig. 19.18)!**

After any adjustment the expansion pins (Fig. 19.18/11) have to be reinserted in the pass holes of the hex. nuts.

The assembly is done in the vice versa order.



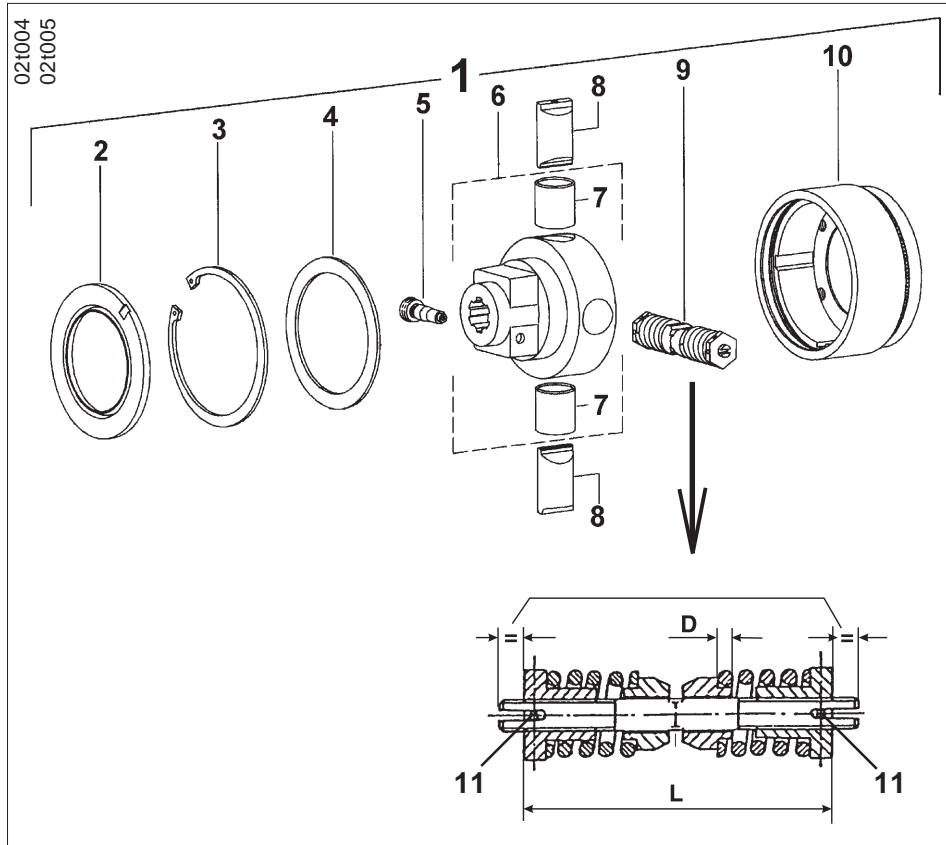


Fig. 19.18

| Clutch type K 64/2 (Clutch outer diameter 170 mm) |   |   |
|---|---|---|
| Spring wire diameter<br>„D“                       | A change of the<br>spring assembly<br>length „L“ of 1mm<br>equals | Shortest permissible<br>spring assembly<br>length „L“ |
| 6,5 mm  | 85 Nm   | 116 mm  |
| 7,0 mm  | 100 Nm  | 119 mm  |
| 7,5 mm  | 140 Nm  | 119 mm  |

Fig. 19.18a

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## 19.10 Removing and installing the rotor shafts

### 19.10.1 Installation before the repairs

During repairs, i. e. when removing one or more rotor shafts (Fig. 19.20/1) from the spur gear trough,

- remove the pto shaft



**Observe the safety advice!**

- remove the packer roller
- remove the side plates
- drain the gear oil from the spur gear trough using the oil drainage plug (Fig. 19.19/1)
- remove the tines and support the implement by stable jacks
- remove the upper part of the framework (Fig. 19.19/2), the transmission (Fig. 19.19/3) and the spur gear trough covering (Fig. 19.19/4).

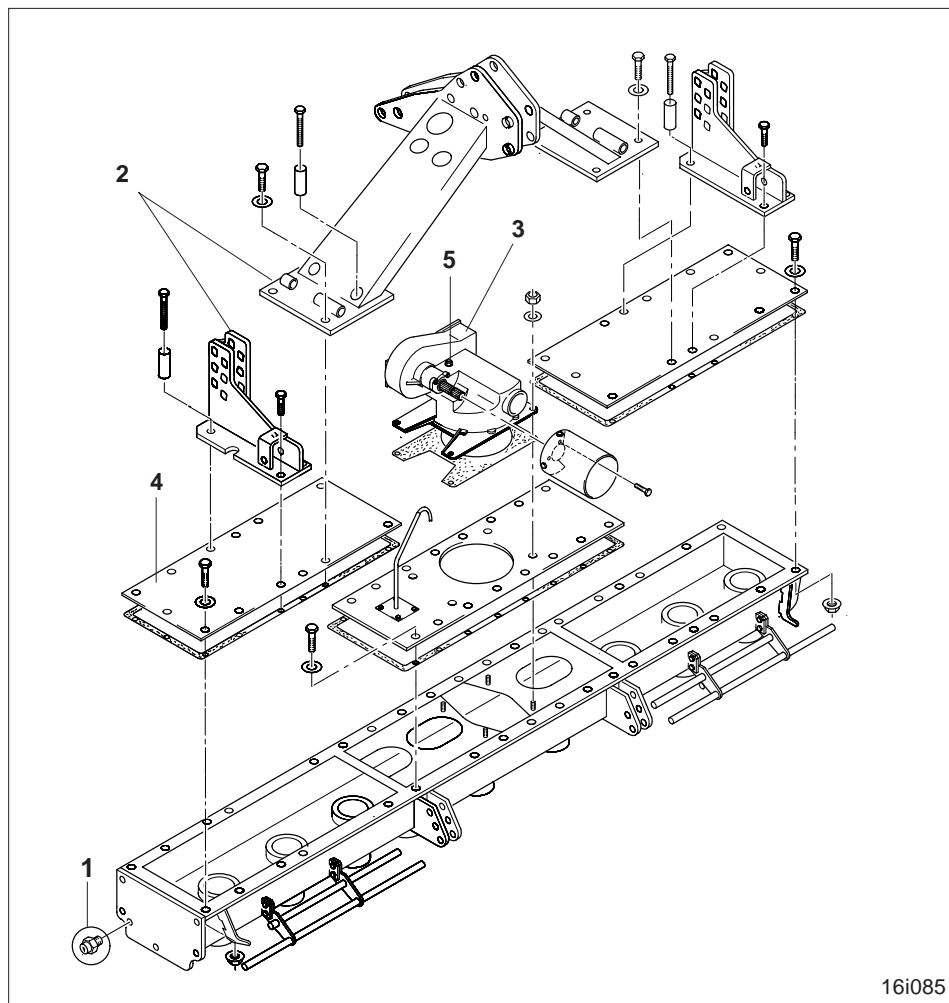


**After the four hex nuts have been removed, the transmission can be lifted using a crane. For fixing the crane hook, bolt an eye bolt instead of the breather screw (Fig. 19.19/5) into the gearbox housing.**

Entirely remove old covering and transmission seals.



**Dirt or bits of transmission and covering seals must not enter the spur gear trough!**



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Fig. 19.19

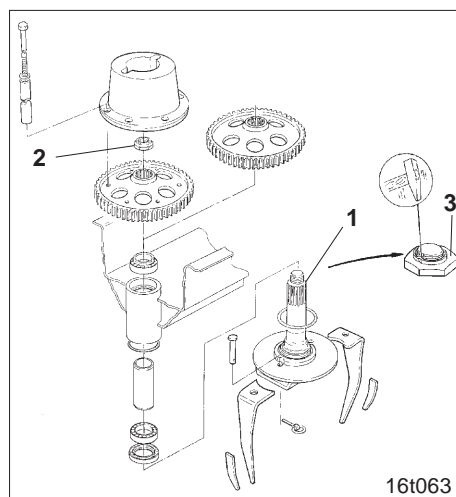


The spur gear fastening nuts (Fig. 19.20/2) are secured. The collar (Fig. 19.20/3) of the spur gear fixing nut is hammered into the rotor shaft groove. Carefully loosen the securing part without damaging the threading of the rotor shaft.



**The threading of the rotor shaft (Fig. 19.20/1) and the spur gear fastening nuts (Fig. 19.20/2) must be free of dirt before removal to prevent damage.**

Remove and install one or more rotor shafts according to para. 19.10.2.



**Fig. 19.20**





### 19.10.2 Installation plan for the rotor shafts

Before removal, pay attention:

Before one or more rotor shafts are removed (Fig. 19.20/1) they must be turned so that the rotor shafts are in the basic position.

**Basic position:** The basic position of the rotor shafts is shown in Fig. 19.21. The view into the open spur gear housing towards the spur gears is shown. The arrow on the centre line shows the driving direction.

In the basic position for all machines, the left most rotor shaft is in the "0°-position". The tines stand in "0°-position perpendicular to the driving direction.

**Before installation, pay attention:**

#### Installing individual rotor shafts:

Install individual removed rotor shafts into the spur gear housing according to Fig. 19.23. Before installing these rotor shafts, the remaining rotor shafts in the spur gear trough must first be brought into the basic position (see above). Then install the removed rotor shafts according to Fig. 19.21.



**Only AMAZONE-rotary cultivators are equipped with spacing sleeves (Fig. 19.23/2) as shown in Fig. 19.23.**

#### Installing all rotor shafts:

If all the rotor shafts were removed from the spur gear trough for repairs, installation begins according to Fig. 19.23 with the first rotor shaft on the outermost left-hand side. After installation, this first rotor shaft is to be brought into the basic position. In the basic position for all machines, the leftmost rotor shaft is in the "0°-position". In the "0°-position", the tines stand perpendicular to the driving direction.

The next rotor shaft is installed perpendicular to the previously assembled rotor shaft,

which is in "0°-position", plus 18° in the direction of the arrow (see arrows above the rotor shafts in the figure) Turning the rotor shaft by 18° is equal to shifting the outer tooth by two tooth positions.

The previously installed rotor shaft must be turned counter to the direction of the arrow above the rotor shaft into the "0°-Position". The next rotor shaft is, as described above, again installed perpendicular to the previously assembled rotor shaft which is in the "0°-position", plus 18° in the direction of the arrow and then turned counter to the direction of the arrow into the "0°-position". This procedure continues until the last rotor shaft.

#### After installing the rotor shafts, pay attention:

When finished, check the installation using Fig. 19.21. Tighten the spur gear trough nuts on the rotor shafts according to para. 19.10.4.

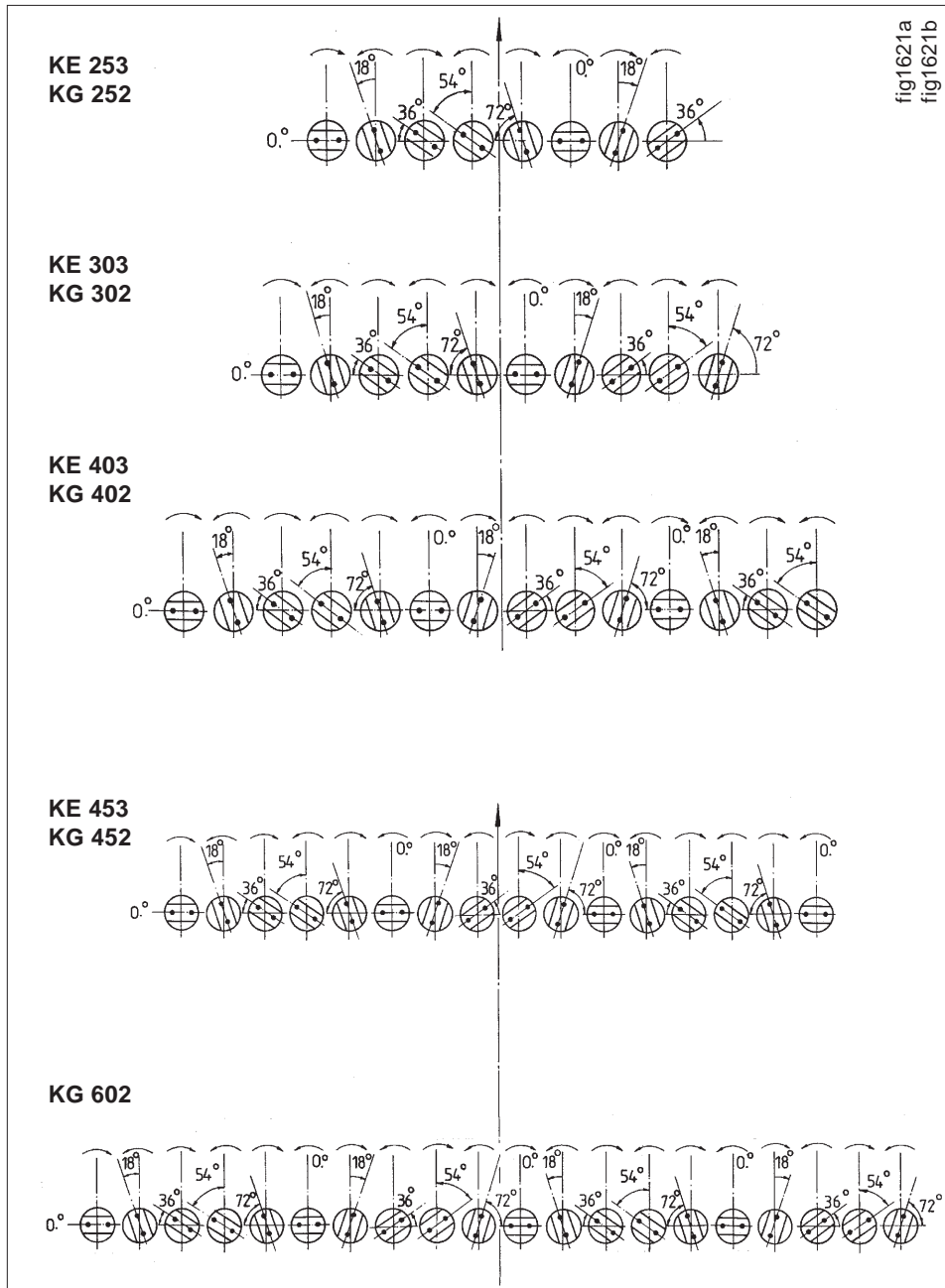


Fig. 19.21



### 19.10.3 Removing an external bearing ring

To remove an external bearing ring (Fig. 19.23/5) the following tools are required:

- An internal remover (Fig. 19.22/2) with counter supports (Fig. 19.22/3)
- Two flat bars (Fig. 19.22/4).

Removing the external support ring (Fig. 19.22/1):

- insert the internal remover (Fig. 19.22/2) into the hole
- by tightening the adjusting nut (Fig. 19.22/5) the removal flanges are spread apart and the sharp projections (Fig. 19.22/arrow) press behind the rounded edge of the external support ring
- lay two flat bars (Fig. 19.22/4) on the support tube (Fig. 19.22/6)
- support the counter supports (Fig. 19.22/3) on the flat bars (Fig. 19.22/4)
- hold on to the grip and tighten the hex nut (Fig. 19.22/7). This pulls out the external support ring (Fig. 19.22/1). When the external support ring has been somewhat loosened, tighten the adjusting nut (Fig. 19.22/5).

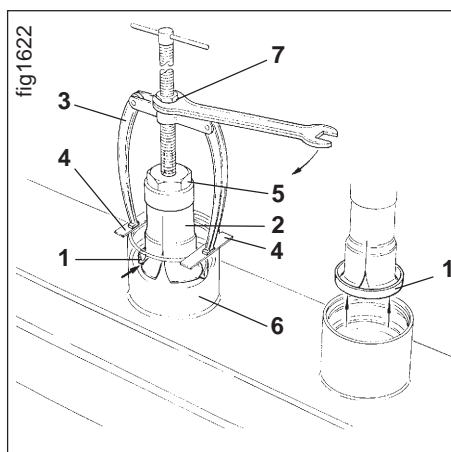


Fig. 19.22



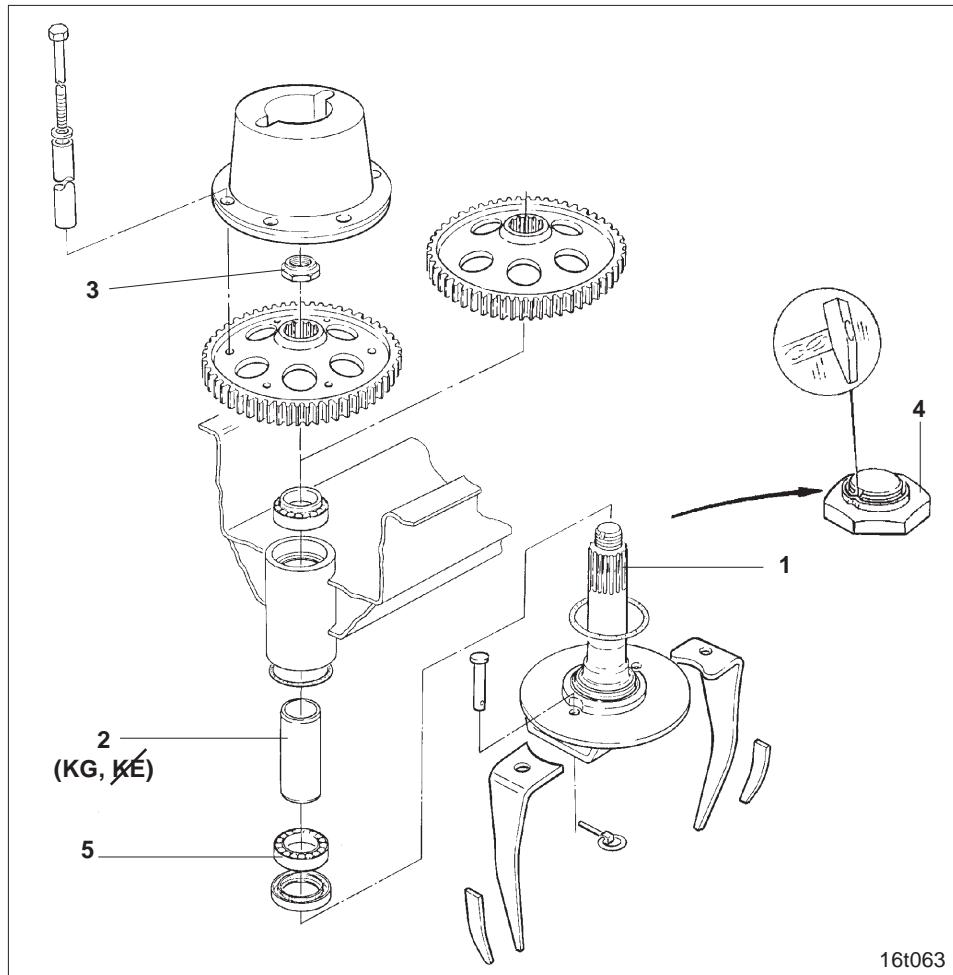


Fig. 19.23



#### 19.10.4 Installing the spur gear fixing nuts

Screw the spur gear fixing nuts (Fig. 19.23/3) onto the rotor shafts (Fig. 19.23/1) and tighten and secure:

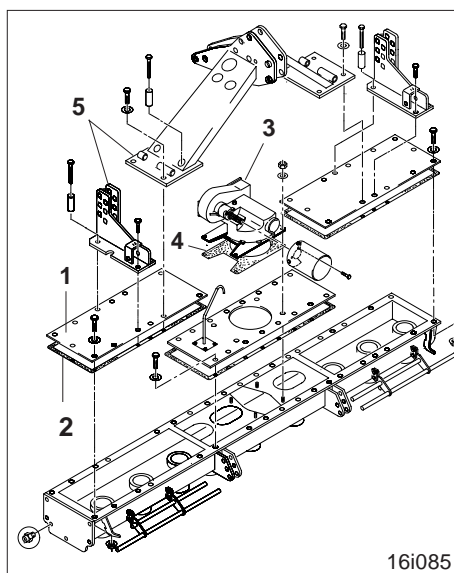
| KE                                | KG       |
|-----------------------------------|----------|
| Spur wheel fixing nut<br>M 45x1,5 | M 52x1,5 |
| Starting torque<br>250 Nm         | 800 Nm   |
| Number of securing nuts<br>1      | 2        |

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Hit the collar of the spur gear fixing nut (Fig. 19.23/3) into the securing groove (Fig. 19.23/4) of the tine rotor shaft (Fig. 19.23/1).

#### 19.10.5 Installation after the repairs

- Install the spur gear trough covering (Fig. 19.24/1) with **new** covering seals (Fig. 19.24/2), the transmission (Fig. 19.24/3) with a **new** covering seal (Fig. 19.24/4) and upper part of the ramework (Fig. 19.24/5)
- Attach the soil tillage tines
- Fill new gear oil into the spur gear trough (see table before)
- Install the side plates
- Attach the packer roller
- Install the pto shaft+.



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Fig. 19.24





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