GBK/GNK/HR-B-GB 01.2006 *991831*

GB

OPERATING MANUAL

AMAZONE

Equipment for the Creation and Maintenance for Greens and Sports Fields

GBK / GNK / HR 11 - 13 - 15 - 20 -25

AMAZONEN-WERKE H.DREYER GmbH & Co. KG

Postfach 51
D-49202 Hasbergen-Gaste
Tel.: (05405) 501-0
Fax: (05405) 501 147

H. Dreyer Str.
D-27798 Hude/Oldenburg
Tel.: (04408) 927-0
Fax: (04408) 927 399

AMAZONE Machines Agricoles S.A.
17, rue de la Verrerie - BP 90106
F-57602 Forbach/France
Tel: 03 87 84 65 70 Fax: 03 87 84 65 71
Internet : www.amazone.fr E-mail : Forbach@amazone.fr

SUMMARY

1. Machine data

1.1 Manufacturer

AMAZONE Machines Agricoles S.A., F-57602 Forbach
(Agricultural Machine Factory)

Phone. : 03 87 84 65 70 Internet: www.amazone.fr
Fax : 03 87 84 65 71 E-mail : forbach@amazone.fr

1.2 Technical data

1.2.1 Combination seeding system

Name	GBK 11	GBK 13	GBK 15	GBK 20	GBK 25
Working width **(m)**	1,10	1,30	1,50	2,00	2,50
„ **(in)**	43	51	59	$78^{3/4}$	$98^{1/2}$
Seed box capacity **(l)**	137	162	194	257	320
„ **(gal.)**	36	43	51	68	$84^{1/2}$
Seed rates **(Kg/ha)**	0-600	0-600	0-600	0-600	0-600
„ **(lbs/acre)**	(0-543)	(0-543)	(0-543)	(0-543)	(0-543)
***RECIPROCATING POWER HARROW (kg)**	_	_	571	663	_
Required tractor **(HP/kW)**	_	_	25 / 18	35 /26	_
***** ROTARY HARROW (kg)**	418	468	518	658	1.041
Required tractor **(HP/kW)**	20 /15	25 / 18	30 / 22	45 / 33	60 / 44
***** STONE BURIER (kg)**	506	556	606	_	_
Required tractor **(HP/kW)**	25 / 18	30 / 22	35 / 26	_	_
***** STONE BURIER** heavy duty model **(kg)**	_	_	895	1.095	_
Required tractor **(HP/kW)**	_	_	70 / 52	80 / 59	_

* Total weight sowing combination with...

1.2.2 Condition master

reciprocating power harrow equipped with:

rigid tine bars + flat roller + side brush + rear brush

		HR 15	HR 20	HR 25
Total weight	***(kg)***	501	579	750
Working width	***(m)***	1,50	2,00	2,50
„	***(in)***	59	$78^{3/4}$	$98^{1/2}$
Required tractor	***(HP)***	from 15	from 24	from 35
„	***(kW)***	from 20	from 32	from 47

Please indicate below the serial number of your harrow and eventually of your seed box.

In case of order of spare parts or complaints we need these informations.

Harrow .....

Roller .....

Seed box .....

2. Important recommendations

2.1 ”DANGER” symbol

All text included in this manual which concerns your personal safety or the safety of third parties are marked with the opposite triangle symbol. Observe all these rules carefully and always proceed with special care. It is up to you to ensure that all persons using the machine have full access to these rules. Beside the regulations included in this manual, you are obliged to comply with the applicable rules for prevention of accidents.

2.2 ”CAUTION” symbol

You will find this warning sign at all those places in the present manual where it is necessary to pay special attention in observing the rules, regulations and recommendations to ensure a correct operating sequence and to avoid any danger of damaging the equipment.

2.3 ”WARNING”symbol

This warning sign marks the special characteristic features of the machine which have to be complied with in order to ensure that the work is carried out correctly.

2.4 ”Recommendation” and ”note” labels

The recommendation labels concern the safety of all those persons working with the machine.
The note labels concern the special characteristic features of the machine which have to be taken into consideration to ensure impeccable operation of the machine.
Dangerous areas are shown in the figures. The warning labels are explained on the following pages.

1. Strictly observe the instructions on the recommendation and note labels.

2. You have to pass on all safety recommendations to all other operators of the machine.

3. Keep the recommendation and note labels on the machine in good order. Replace those recommendation and note labels which are missing or which have been damaged(figure No. = order No.)!

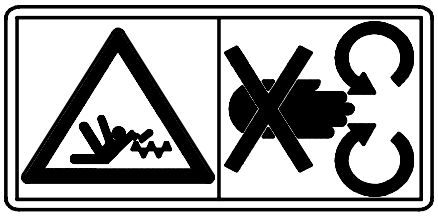

Fig. MD083

Explanation:

Never put your hand in the seeder: the moving shaft is permanently driven by the roller and is turning even when the range selector box is in position ”0”!

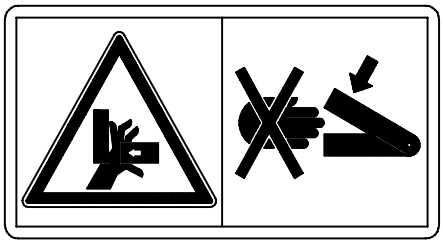

Fig. MD078

Explanation:

Only start the machine with the prescribed protection devices!
Devices may neither be opened nor removed!
Before removing the prescribed protection devices switch off the power take-off and the engine and take out the ignition key.

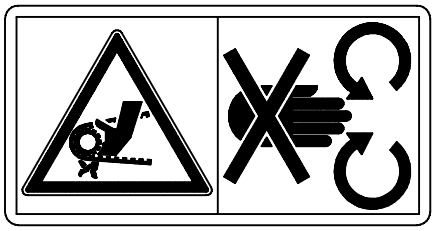

Fig. MD076

Explanation:

Clear people from dangerous places!

Never put your hand in a zone where there is danger of getting cut or bruised. As the components included there in could still be in motion!

2.5 Arrival of the machine

Check the machine for damage and completeness when it arrives. Should you have received a damaged or incomplete machine you will have to immediately lodge a complaint with the forwarding agent. Check whether all items mentioned on the consignment note have been duly supplied.

Before commissioning, you first have to remove all packing material and wire ends without any exceptions and then check the machine for lubrication (cardan shaft).

2.6 Fields of application

AMAZONE HR Conditionmasters, GBK Combination Seeding Systems and GNK Overseeders are exclusively reserved for being regularly used for the creation and maintenance work, to be carried out on greens and sports fields.

Any application not falling within the above-mentioned framework is considered inappropriate. The manufacturer is not liable for any damage which might result from such applications. The operator is legally responsible for any consequences possibly resulting therefrom.

A proper and appropriate application also means that all the manufacturer's rules and recommendations with regard to the conditions of use, maintenance and repair are complied with and that **original AMAZONE spare parts** are used exclusively.

AMAZONE HR Conditionmasters, GBK Combination Seeding Systems and GNK Overseeders may only be operated, maintained and repaired by trained personnel who have also been informed about the risks involved.

Observe all rules for prevention of accidents as well as all other general medico-technical safety regulations, including the safety rules of the road, and must strictly comply with the safety recommendations given on the labels attached on the machine, its components and accessories.

Any unilaterally executed modification of the machine automatically excludes all guarantee claims against the manufacturer for any damage resulting therefrom.

3. General safety regulations and rules for prevention of accidents

Basic Rule!
Before every application, check the machine and the tractor for compliance with the road and occupational safety regulations!

1. In addition to the regulations stated in this manual you also have to observe the general safety regulations and rules for prevention of accidents!

2. The note and recommendation labels attached on the machine will give you important rules for operating the machine without any risk. Observing these notes and recommendations ensures your personal safety!

3. Observe the applicable regulations when driving on public roads!

4. Make yourself familiar with the operation of all operating devices and equipment before starting to work. When you are already at work, it is too late to do so!

5. Workwear has to fit tightly. Avoid wearing too large clothes!

6. Before starting or commissioning, check the immediate surroundings (children!). Ensure a clear view!

7. It is strictly forbidden to transport people on the machine while it is at work or in motion!

8. Couple the machines in accordance with the supplied instructions and only to those towing vehicles provided for this purpose!

9 Take the necessary precautions for coupling and uncoupling the machines to and from the tractor!

10. Suitably position the supports for coupling/uncoupling purposes in order to ensure the stability of the machine during operation!

11. Always duly fix the weights at the prescribed fixing points!

12. Observe the admissible axle load of the tractor (refer to the registration book)!

13. Follow the Engine Vehicle Regulations with regard to the overall dimensions admissible for transport purposes!

14. Check and provide all equipment prescribed for transport purposes: lighting, signalling equipment and protection devices, if any!

15. The control cables of the quick release connections must suspend freely and must not trigger any uncoupling when in lowered position!

16. Never leave the driver seat when the machine is in operation!

17. Stability, steering and brake reaction are influenced by carried or towed machines. Therefore, take care that the steering mechanism and the brakes function properly!

18. When the machine is lifted, a load is taken from the front axle of the tractor which varies in accordance with the size of the machine. Strictly observe the load prescribed for the front axle (only 20 % of the tractor weight)!

19. In curves, protruding objects and the mass of inertia have to be taken into account! To avoid oscillations of the spreader during operation, the lower tractor coupling bars have to be reinforced!

20. Before you start, the protection devices have to be mounted and checked for correct operation!

21. It is forbidden to stay in the working range of the machine!

22. Do not stay in the manoeuvring or oscillation zone of the machine!

23. All hydraulically controlled and tilting devices may only be operated when there is nobody in the operating zone!

24. In the area of the parts driven by an external power source (e. g. hydraulically) there is danger of getting bruising or cutting injuries!

25. Before leaving the tractor, lower the equipment to the ground, switch off the engine and take out the ignition key!

26. Never stay between the tractor and the machine without having secured the towing vehicle against any unintentional displacement by means of the hand brake and/or by wheel shock blocks!

27. The towing vehicle is designed for coupling equipment and trailers with two axles for the following cases:

    - the transport speed does not exceed 25 km/h,
    - the trailer has a brake of inertia or a braking device which can be actuated by the driver of the towing vehicle,
    - the total weight of the trailer load does not exceed **1.25 times** the admissible total weight for the load of the towing vehicle, however, the limit being **5 Mt**.

It is stricktly forbidden to trail any, so called, vehicle behind a machine already hooked on a tractor.

3.1 Machines coupled to a tractor

1. Before coupling/uncoupling the machine at the 3 lifting points, position the controls in such a way that any unintentional lifting/lowering of the machine is prevented!

2. For 3-point couplings, it has to be ensured that the coupling parts of the tractor are in accordance with those of the machine!

3. In the area of the 3-point coupling bars there is danger of physical injuries by bruises!

4. When the external control device of the 3-point coupling is actuated you must never stay between the tractor and the machine!

5. When the machine is in transport position, always make sure that the coupling bars have been locked laterally in order to avoid horizontal oscillations (swan).

6. During transport, with the machine being lifted, engage the switch in locking position to prevent any risk of an unintentional lowering of the machine!

7. Couple and uncouple the machine in accordance with the instructions. Check the brakes for correct operation. Observe the manufacturer’s instructions!

8. Machines may only be transported or towed by means of tractors which are suitable for this purpose!

3.2 Power take-off

1. Exclusively use the cardan drives prescribed by the manufacturer and equipped with the required protection devices!

2. The protecting tube and protective covering of the cardan drive as well as the protection device of the power take-off - also on the machine - must be available and fully protective!

3. Take care to observe the correct overlapping length of both halves of the cardan drive, both, during transport and during operation (refer to the operating instructions of the cardan shaft manufacturer)!

4. Mounting/dismounting of the cardan drive will only take place after the power take-off and the engine have been switched off and after the ignition key has been removed.

5. Always take care that the cardan drive is mounted and locked correctly!

6. Ensure that the protecting tube of the drive is immobilised by fixing its chains!

7. Before switching on the power take-off, check whether the operating range selected for the power take-off of the tractor is in conformity with the range admissible for the machine (operating range). In general, the operating range of the power take-off is 540 rpm (refer to the data given in the control table).

8. The tractor and machine components are preserved by progressively switching on power!

9. If the power take-off is in proportion with the distance covered (ground related drive), take care that the range is proportional to the driving speed and note that the sense of rotation is reversed when in reverse motion!

10. Before switching on the power take-off, make sure that there is nobody in the working range of the machine!

11. Never switch on the power take-off when the engine is switched off!

12. Make sure that there is nobody in the areas of rotation of the power take-off or of the cardan drive when work is in progress!

13. Always switch off the power take-off if the angle of the drive is excessive or if it is not in use!

14. Caution! After the power take-off has been switched off there is a danger of physical injuries caused by the mass of inertia still in motion! Do not approach the machine too closely at this time! Any interventions at the machine may only be carried out after the machine has come to a complete standstill!

15. Any cleaning or lubricating work or the adjustment of machines driven by power take-off or cardan transmission may only be carried out after the power take-off and the engine have been switched off and the ignition key has been taken out!

16. When the cardan drive has been uncoupled it has to be fixed on the support provided for this purpose!

17. After the transmission has been dismounted, put the protection of the shaft stud onto the shaft end of the power take-off!

18. Immediately repair any damage to the machine before using it!

3.3 Maintenance instructions

1. Before any repair, maintenance or cleaning works are carried out and before any troubles are eliminated, switch off the drive and the engine! Take out the ignition key!

2. Regularly check the bolts and nuts for a tight fit and tighten them, if necessary!

3. Fasten the machine by appropriate means for any intervention requiring that the machine remains in its position!

4. Change the oils, greases and filters at the prescribed service intervals!

5. Switch off the power supply for all servicing work at the electric circuit!

6. Disconnect the connection cables from the generator and from the battery before you carry out any welding works at the tractor or at the machine!

7. The spare parts have to meet at least the manufacturer’s technical specifications. This is the case, if e. g. **original** spare parts are used!

4. Modular system components

AMAZONE equipment for creating and maintaining greens and sports fields is composed of several components forming a modular system. These components are as follows:

- a reciprocating harrow onto which the different machine bars can be mounted,
- a screen roller or a flat roller,
- a seeder for the combination seeding system of the overseeder.

The advantage of this modular system (Fig. 1) is that one single machine can be used for different applications.

By adapting the different machine bars to the basic element, i. e. the harrow, and by combining the accessories, the machine can be used for the following applications:

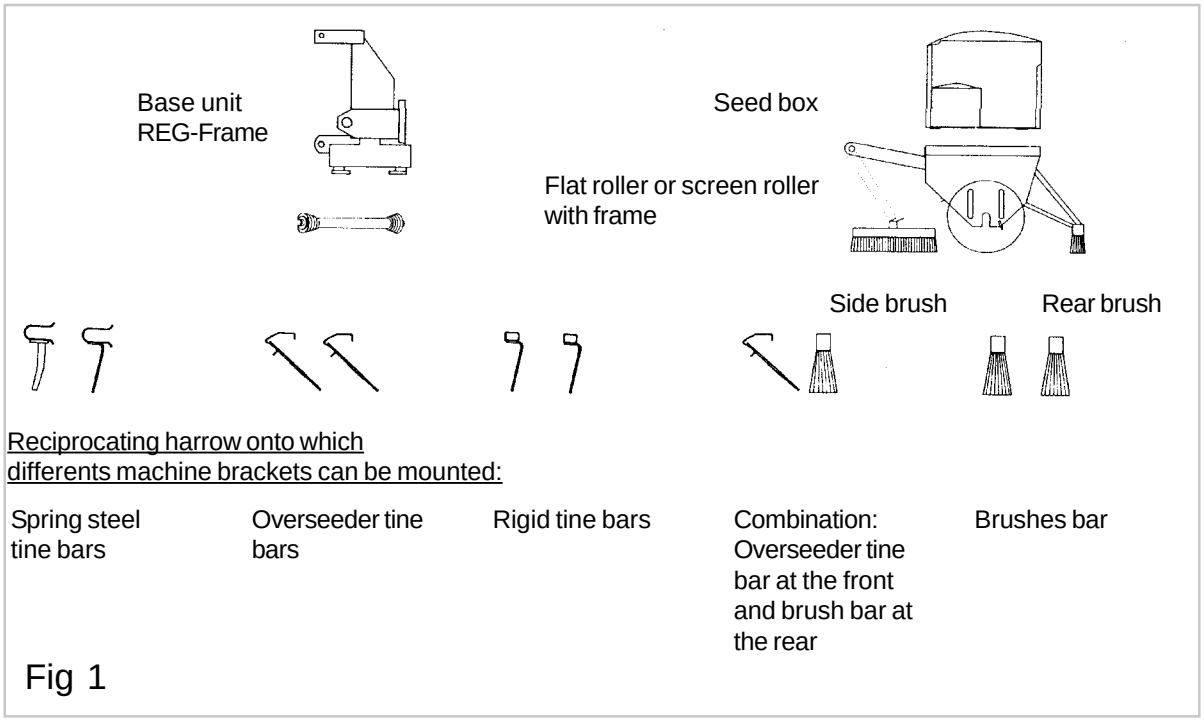

Fig 1

- as a combination seeding system for newly created greens,
- as an overseeder for already existing greens,
- for regenerating surfaced grounds and consolidated surfaces,
- for weekly maintaining consolidated surfaces,
- for maintaining sandy artificial lawn.

4.1 Reciprocating harrow

4.1.1 Technical data

	REG15	REG20	REG 25
Working Width (m)	1.50	2.00	2.50
Weight without machine Bars (kg)	230	235	370
Oil Bath Container Capacity	3 litres		
Oil For Filling	JTR 6.5°, E/50°C SAE 80		

4.1.2 Reciprocating harrow mounting and adjustment

The ”three-point” coupling hooks below the harrow are horizontally adjustable in the driving direction of the machine. They can also be mounted towards the outside or towards the inside. By means of these different adjustments it is possible to mount the reciprocating harrow on any type of tractor.

The coupling bars below the tractor must be tightened, however, a slight lateral movement of the harrow must still be possible.

The upper tie rod of the coupling has to be adjusted in such a way that the reciprocating harrow is horizontal or slightly inclined towards the back when in operating position. Caution: The machine must never be inclined towards the front (Fig. 2 + 3).

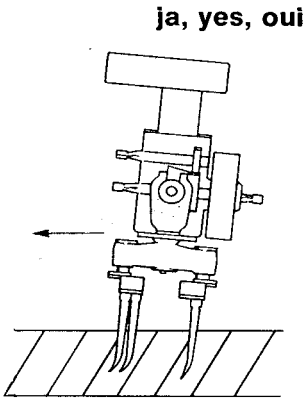

Fig 2

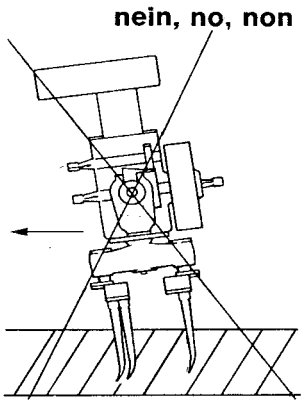

Fig 3

Take care that there is nobody behind or beneath the machine since the machine can swing out at the back if both parts of the upper tie rod work loose or break loose by mistake.

Lowering of the machine must take at least two seconds. Adjust the lowering limit switch, if any, accordingly. Smoothly put the loaded machine on the ground.

4.1.3 Cardan shaft

Only use the cardan drive prescribed by the manufacturer!

Walterscheid W 2300 SD 15 560 K65/2

4.1.4 Cardan shaft mounting

Preliminarily clean the shaft entering the casing and always put a greased cardan shaft on the entry shaft.

4.1.5 Cardan shaft adjustment by coupling the machine for the first time

When the cardan shaft is coupled to the tractor for the first time, adapt it as indicated in Fig. 4. As the mode of adaptation is only applicable to this type of tractor, check whether the cardan shaft has to be adapted if mounted on another type of tractor.

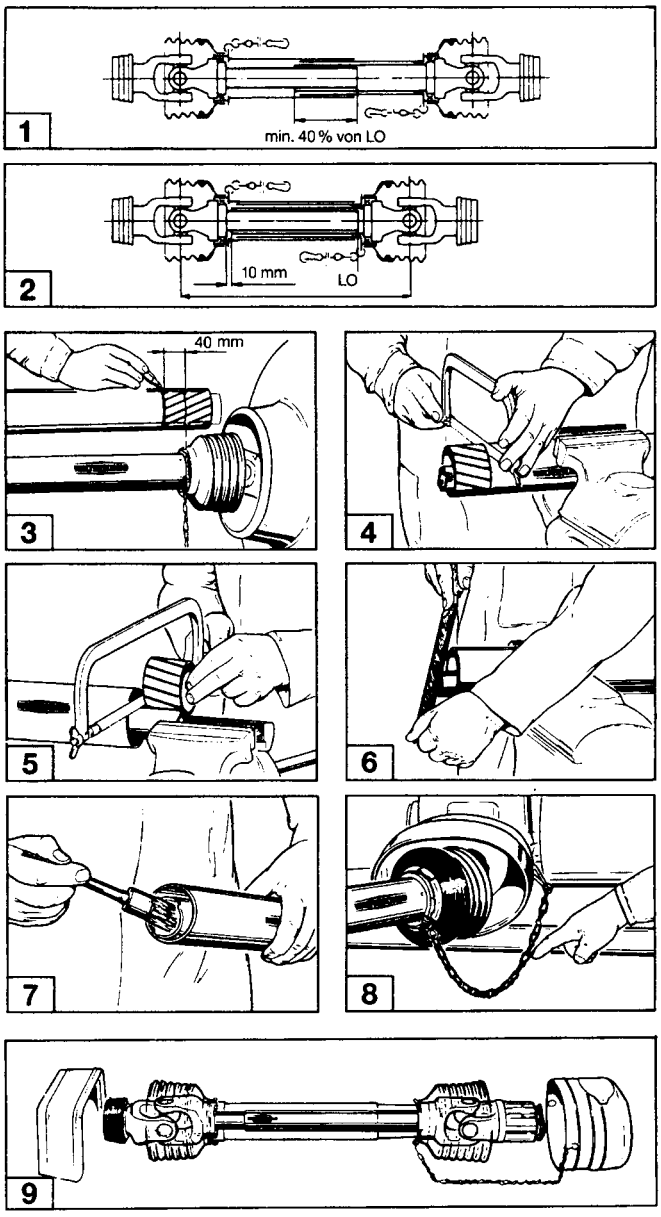

Fig 4

When mounting the machine for the first time, fix the transmission half in front onto the power take-off shaft of the tractor. Do not insert the special section tubes into each other.

1. Check whether the special section tubes can be inserted into each other in any position by holding them side by side.

2. When the special section tubes have been firmly inserted into each other, they must not knock against the cardan crosspieces. It is absolutely necessary to reserve a safe distance of at least 10 mm.

3. To adjust the lengths of the transmission halves hold them side by side in their shortest working position and mark them.

4. Identically shorten the protecting tubes internally and externally.

5. Identically shorten the special section tubes.

6. Deburr the edges of sectioned tubes and thoroughly remove metal residues.

7. Grease the special section tubes and insert them into each other.

8. When fastening the little chains in the hole drilled into the bracket bracing of the upper tie rod make sure that there is sufficient freedom of motion ensured for the cardan drive in every operating position and take care that the cardan protection cannot turn simultaneously.

9. Exclusively work with a cardan drive which is equipped with all protection devices.
   The drive must be complete with regard to the protection devices and the protective coverings at the tractor and the machine. The protection devices have to be replaced as soon as they have been damaged.

The angle of a cardan crosspiece must not exceed 25°.
Please also follow the mounting and maintenance instructions attached on the cardan drive.
To ensure that the cardan drive is not damaged, only start it slowly at a low engine speed!

4.1.6 Speed at the entry of the angular gear casing

The maximum speed at the input shaft is 540 rpm.

N = 540 rpm

A speed above 540 rpm dangerously increases the rotor speed, thus possibly causing desintegration of the rotor and the blades causing injuries to the operator.

Damages due to a cardan speed above 540 rpm are not covered by the guarantee.

4.1.7 The different equipment bars

Rigid tine bars

Rigid tine bars serve the purpose of regenerating, i. e. loosening, levelling and newly consolidating, surfaced ground, consolidated surfaces and promenades. For this application, the harrow equipped with rigid tine bars has to be combined with the flat roller.

Spring steel tine bars

Owing to the robustness of the spring steel tine bars it is possible to prepare the soil before seeding even under difficult conditions. The triangular teeth ensure a good loosening of the soil and the flat double teeth level the soil and avoid seeding in lines.

Overseeding tine bars

The overseeding tine bars combined with the seeder ensure regular and even broadcast overseeding over the whole working surface. This combination can also be used as a combination seeding system on a surface where the soil has already been prepared. Actually, the position of the overseeding tine bars avoid buried stones are retransported to the surface.

Brush Bars

Consolidated ground can be maintained weekly by combining overseeding tine bar in front of the harrow with a brush bar at the rear. After the brush bars have been mounted in front and at the rear of the harrow, the machine carries out all maintenance works on sandy artificial lawns.

4.1.8 Maintenance

The casing of the reciprocating harrow is furnished with an oil-bath lubrication. All bearing systems are equipped with conical roller bearings which do not require any greasing.

It is not necessary to empty the oil. The oil level must be visible through the level inspection glass when the harrow is in horizontal position. For refilling the oil level, use Engler gear oil of a viscosity of 6.5 for a temperature of 50°C according to the SAE 80 standard. It must by all means be ensured that the gear oil is clean and that no impurities enter the casing during the filling process.

The casing cover only has to be unscrewed for repair purposes in order to avoid any risk of a deterioration of the roller bearings.

5. Screen roller and flat roller

5.1 Technical data of screen roller

	GIW 11	GIW 13	GIW 15	GIW 20	GIW 25
Diameter (mm)	420	420	420	420	420
Working width (m)	1.20	1.40	1.60	2.10	2.60
Weight (kg)	115	130	145	170	195

5.2 Technical data of flat roller

	GLW 11	GLW 13	GLW 15	GLW 20	GLW 25
Diameter (mm)	360	360	360	360	360
Working width (m)	1.20	1.40	1.60	2.10	2.60
Weight (kg)	132	147	162	187	212

5.3 Scraper bar

The screen roller is in series equipped with a scraper bar. This scraper bar is held by two springs and can be adjusted by means of two M8 x 60 screws available on the side walls of the casing (Fig. 5/1). The scraper bar can be effectively used both in forward and rear motion due to its slide rails by means of which it can retract when obstacles are in its way (stones, etc.). It can also be folded up for cleaning purposes.

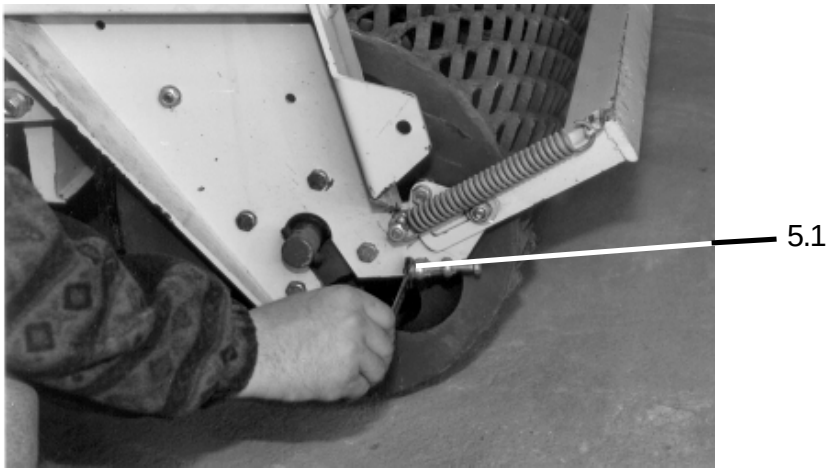

fig. 5

5.4 Screen roller dismounting

The screen roller is combined with the reciprocating harrow by two support bars (Fig. 6/1).

To dismount the screen roller from the reciprocating harrow proceed as follows:

- Lower the lift of the tractor until the support bars are free, i. e. until they are neither supported by the upper eccentric (Fig. 6/2) nor by the lower eccentric (Fig. 6/3).
- Remove the fastening screws.
- Remove the fastening axles (Fig. 7).

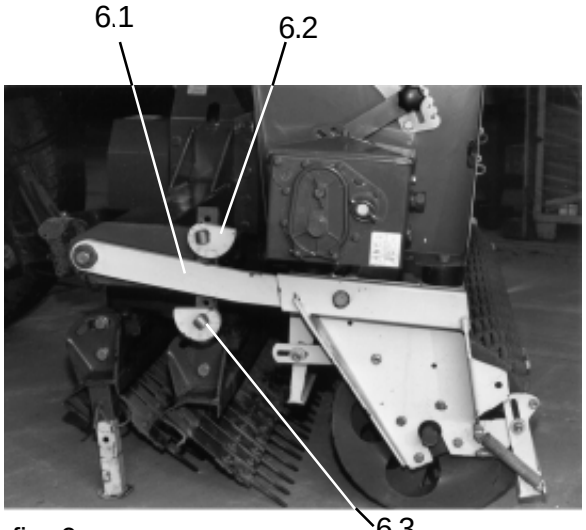

fig. 6

fig. 7

C A U T I O N ! !
Before uncoupling the harrow, the screen roller must be blocked to ensure its balance and security.

For coupling another machine (rotary harrow or stone burier) proceed as follows when uncoupling the harrow from the roller:

- Couple the machine to the tractor.
- Lift the machine until the reciprocating harrow is no longer in contact with the ground whereas the roller is still on the ground.
- Remove the bracket locking screws (Fig. 8).
- Block the roller + seeder unit.
- Smoothly advance the harrow with the tractor.

Proceed in reverse order for coupling the rotary harrow or the stone burier to the roller.

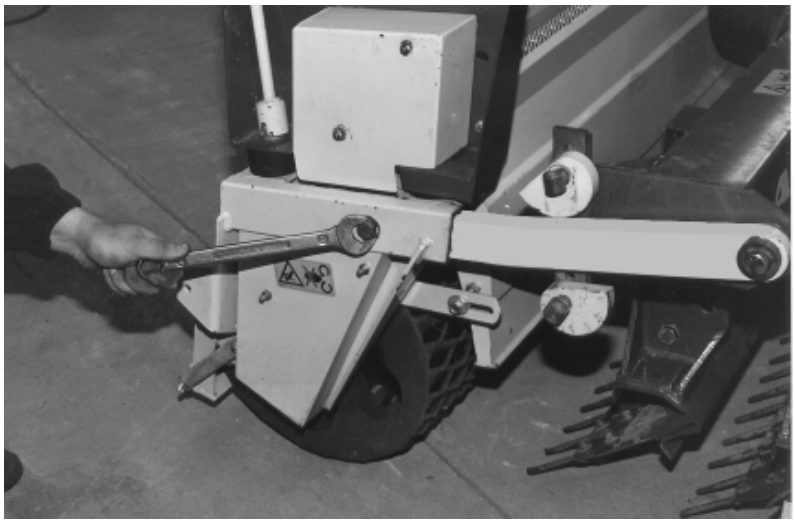

fig. 8

5.5 Flat roller weighting

To obtain a stronger consolidation and compactness, the flat roller can be weighted by means of water. The flasks laterally attached to the roller are equipped with fasteners for connecting an irrigation tube on the one side and for allowing the air to escape on the other side during the filling process. Before the winter period, the roller has to be emptied if the machine is stored in a place with no heating.

5.6 Maintenance

The roller bearings must be greased after 50 operating hours (Fig. 9).

fig. 9

6. Seeder

6.1 Technical data

Seeders	1.10 m	1.30 m	1.50 m	2.00 m	2.50 m
Working Width (m)	1.10	1.30	1.50	2.00	2.50
Overall Width (m)	1.44	1.64	1.84	2.34	2.84
Height (m)	0.51	0.51	0.51	0.51	0.51
Length (m)	0.43	0.43	0.43	0.43	0.43
Empty Weight (kg)	85	90	95	110	125
Capacity (l)	143	167	194	257	320

Seed rates kg/ha .....0-600.....

Flow Rate Selector Box with Oil Bath Hydraulic Oil WTL 16.5 C ST / 50°
Capacity 1.80 l

6.2 Seeder mounting

The seeder is mounted with silentblocks on the chassis of the roller.

The tension of the chain drive is ensured by a tensioning roller fixed at the roller chassis (Fig. 10/1)

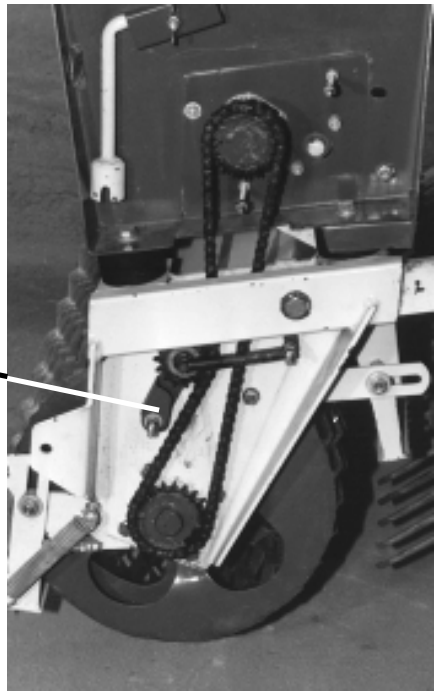

fig. 10

The chain drive is housed in a protective casing.

For dismounting the seeder proceed as follows:

- Remove the upper and the lower protective casing of the chain drive (Fig. 11).

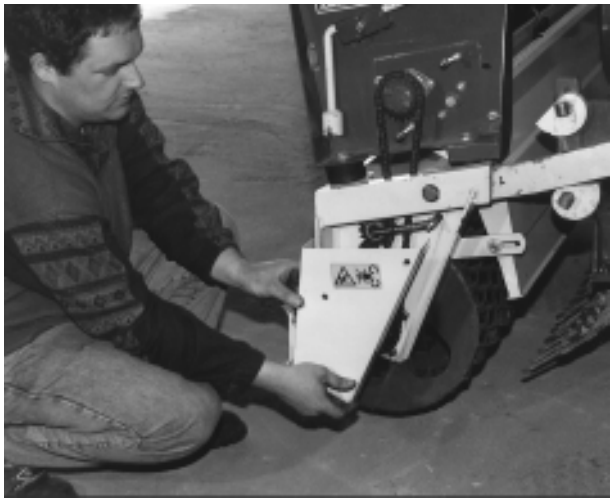

fig. 11

- Detach the spring of the tensioning roller by means of pliers.

- Remove the chain by preliminarily dismounting the chain link for a rapid disassembly.

- Remove the three fastening screws M12 by means of which the seeder is held on the chassis.

- Put the seeder down.

Proceed in reverse order to lift the seeder again.

6.3 Seeder filling

Make sure that the bottom plate is closed and locked before filling the seeder. Couple the machine to the tractor and open the cover of the seeder which is locked automatically. When opened, the cover cannot close unexpectedly during the filling process which can then simply take place at the rear part of the seeder.

When closing the seeder, lift the stay bar with one hand and lower the cover with the other. The cover ensures a tight lock against any atmospheric influences.

Take care during the execution of the work that the seeder never gets empty since the seeded quantities are irregular owing to their different distribution in the seeder.

6.4 Seeder emptying

After the works have been carried out, the seeder is emptied as follows:

- Open the wing screw holding the emptying slide rail.

- Detach the slide rail from the rear part of the seeder (Fig. 12).

fig. 12

- Fasten a sack to the hooks of the slide rail.

- Insert the slide rail on the chute and make sure that its opening is completely closed.

- Open the bolts of the bottom plate (Fig. 13) and let it fold down. The seeds flow into the chute and from there into the sack until the slide rail is removed from the chute (Fig. 14).

- After the seeder has been emptied, restore the slide rail on the rear part of the seeder.

The seeder can be cleaned by means of a water jet or a high-pressure cleaning apparatus. If the seeder is cleaned with compressed air, do not breath in the dust since the products with which the seeds have been treated are noxious.

It is necessary to empty and to clean the seedbox several times in the year!

For storage purposes, the bottom plate of the seeder must always be kept in an open position because rodents attracted by the smell of the seeds during the winter months could damage the plastic distributing wheels when trying to penetrate the seeder.

fig. 13

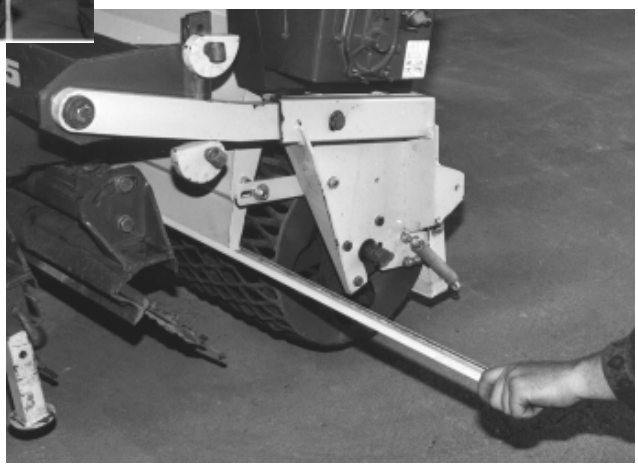

fig. 14

6.5 Adjustment of flow rate

To adjust the flow rate, refer to the flow rate table in chapter 6.7.

- Unscrew the handle of the selector lever (Fig. 15/1) for adjusting the flow rate of seeds,
- place the index on the selected value in the flow rate table,
- the selector lever has to be brought into the selected position from the bottom towards the top,
- after the flow rate has been adjusted, fasten the handle again.

C A U T I O N ! !

The values stated in the flow rate table are reference figures. To determine the exact seeding quantity of the seeder for the seeds used, a flow rate control must in any case be carried out since the seeded quantities differ considerably due to the respective grain sizes of the seeds, their forms and specific gravities as well as those of the agents with which they have been treated.

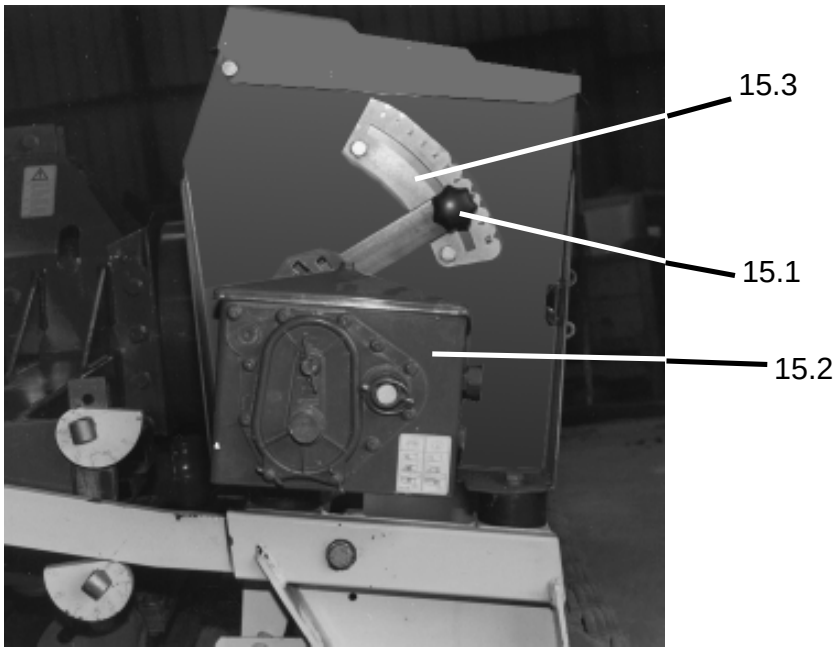

fig. 15

6.6 Recommendations for slow- and high-speed seeding

The speed of the camshaft - and thus the flow rate of grains - is infinitely adjustable by means of the range selector box (Fig. 15/2). The box includes an additional reduction by means of gearwheels. By exchanging one of these gearwheels, two distributing speeds can be obtained:

Low speed **High speed**

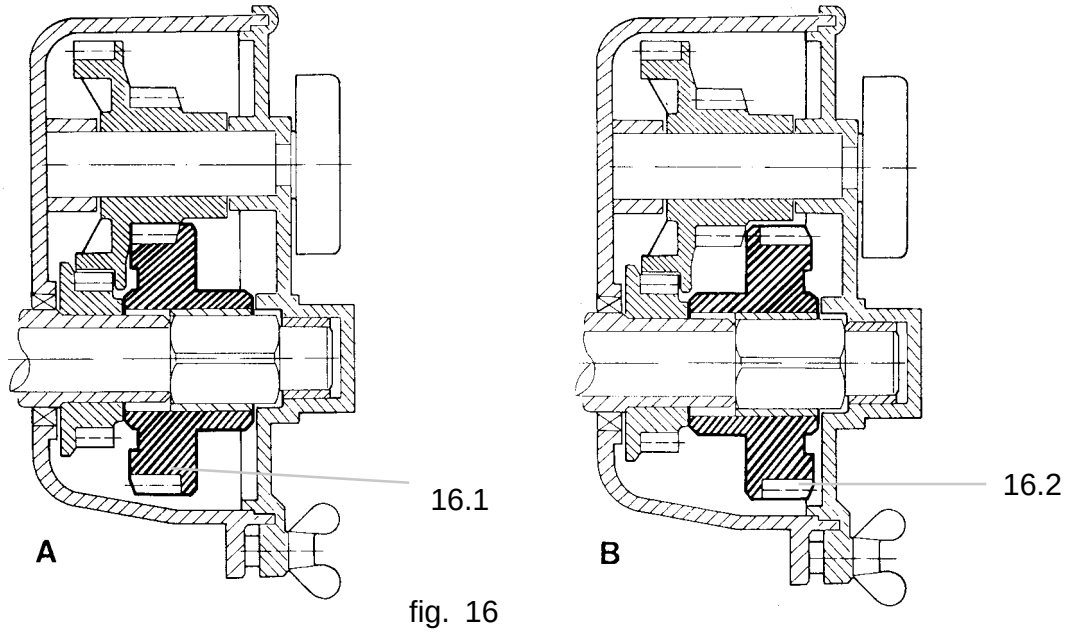

fig. 16

By switching the selector box from low speed to high speed, the scale of index values (Fig. 15/3) can be increased. However, high speed should only be selected if the desired quantity cannot be obtained by selecting the maximum position at low speed. When leaving our works, the selector box is pre-set on ”low speed”.

If possible, only seed at low speed. After seeding at high speed, do not forget to readjust the seeder to low speed.

6.6.1 How can the range selector box be adjusted to high speed?

If necessary, proceed as follows for switching from low speed to high speed: Open the cover (Fig. 17/1) on the side of the selector box by unscrewing the wing screw and the two wing nuts (Fig. 17/2).

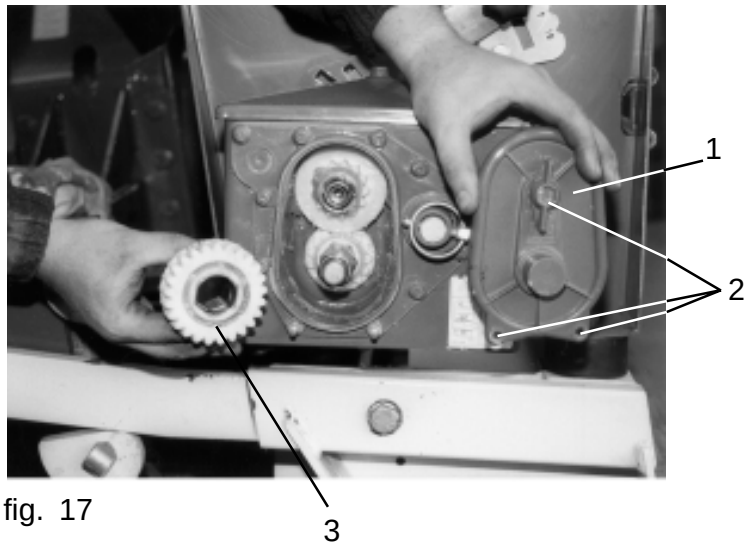

fig. 17

Remove the lower gearwheel from the shaft (Fig. 17/3), turn it around and restore it. If the gearwheel cannot be removed from the shaft manually, slightly turn the camshaft in the direction of rotation by means of pliers until the gearwheel can easily be removed from the shaft.

At low speed (Fig. 16.1), the gearwheel is engaged in the teeth of the wheel above it; at high speed (Fig. 16.2), it freely turns on its axle. After having exchanged the gearwheel, close the cover of the selector box again.

C A U T I O N ! !

If possible, only seed at low speed. After seeding at high speed, do not forget to readjust the seeder to low speed.

6.7 Flow rate table

Seeds: Resistant Lawn

Specific Gravity : 0.37 kg / P

Weight at Flow Rate **Seeded Quantity kg/ha**

Selector Switch	Low Speed	High Speed
1	25 kg/ha	38 kg/ha
2	56 kg/ha	137 kg/ha
3	82 kg/ha	212 kg/ha
4	109 kg/ha	304 kg/ha
5	137 kg/ha	387 kg/ha
6	163 kg/ha	464 kg/ha
7	191 kg/ha	524 kg/ha
8	225 kg/ha	589 kg/ha
9	258 kg/ha	651 kg/ha
10	274 kg/ha	693 kg/ha

6.8 Flow rate control

The aim of the flow rate control is to verify whether the seeded quantity is in accordance with the desired quantity. Set the selector lever on the index corresponding to the desired seeding quantity indicated in the flow rate table.

Only fill half of the seeder because the crank handle will then turn more easily during the control operation than with a full seeder.

- Lift the machine until the roller turns freely.
- Take care that the seeder is in horizontal position.
- Place the slide rail with the sack under the chute (Chapt. 6.4).

- Slide the crank handle onto the roller axle on the left in the running direction (Fig. 18):

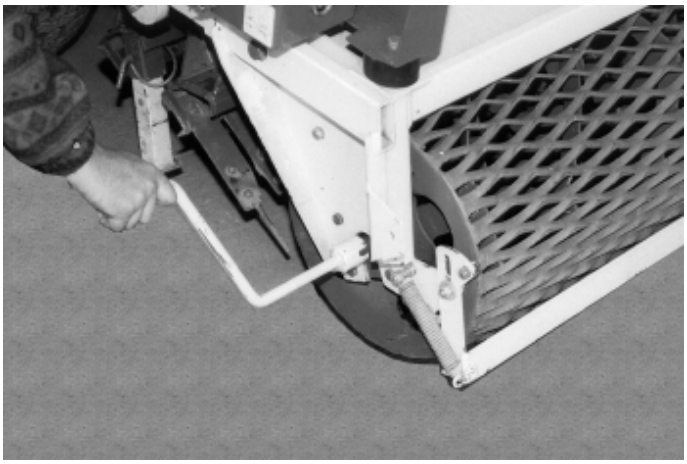

fig. 18

- Effect some rotations to the right until seeds are released from the distributing wheels. All wheels are now filled with seeds.

- Empty the chute into the funnel by means of the slide rail and restore the slide rail in its place.

  The actual flow rate control can now be started.

Working Width	**No. of roller revolutions**	
	Corresponding to a worked surface of one are	
	Screen roller ∅ 420 mm	Flat roller ∅ 360 mm
1.10 m	67.5	80
1.30 m	57	67.5
1.50 m	49.5	58.5
2.00 m	37	44
2.50 m	29.5	35

The seeds collected in the sack have to be weighed (Fig. 19). The weight of these seeds has to be multiplied by 100 in order to obtain the equivalent of the quantity in kg/ha.

fig. 19

For 1 are (100 m²): Weighed quantity x 100 = Seeded quantity in kg/ha

To obtain a larger quantity a higher number has to be selected on the graduated scale of the selector, and vice versa to obtain a smaller quantity. If necessary, repeat the controls until the desired quantity has been obtained.

C A U T I O N ! !

For operating the Combination Seeding System it is recommended not to exceed a working speed of 6 km/h. And when the flow rate is controlled, the crank handle must not be turned by more than 80 rpm.

6.9. Maintenance

The AMAZONE Seeder has been designed and realised for reducing maintenance works to a minimum. However, it is recommended to check the following points at regular intervals:

The oil level in the selector box by means of the level indicator.
It is not necessary to empty the oil from the box.
To refill oil remove the cover of the box by unscrewing the screw M8 in the middle of the cover. Only use hydraulic oil WTL 16.5 c ST/50°C.
The filling quantity is 1.8 l.

The chain drive.

After about 50 operating hours, check the state of the chain and grease it, if necessary.

7. AMAZONE GBK Combination seeding system

7.1 Fields of application

With the AMAZONE GBK Combination Seeding System, you can create new greens, such as e. g. sports fields, fairways, parks, etc.

Its application for creating greens makes it possible to execute the following works in a single operation:

- An impeccable levelling of the worked surface,

- Collection of medium-sized stones which have been pinched between the two flexible bars, and depositing them at the end of the working surface,

- Preparation of the soil to create an ideal seedbed,

- Broadcast seeding of the entire worked surface.

Remark:

For soil preparation applications (without seeding), it is recommended to dismount the seeder to ensure that the strong vibrations are not transmitted to it.

7.2 Working with the combination seeding system

7.2.1 Harrow working depth adjustment

While at work, the reciprocating harrow must permanently be carried by the screen roller to ensure a constant working depth. The working depth may vary due to the upper eccentrics (Fig. 20). They serve the purpose of regulating the working depth by being turned towards the front or towards the rear side.

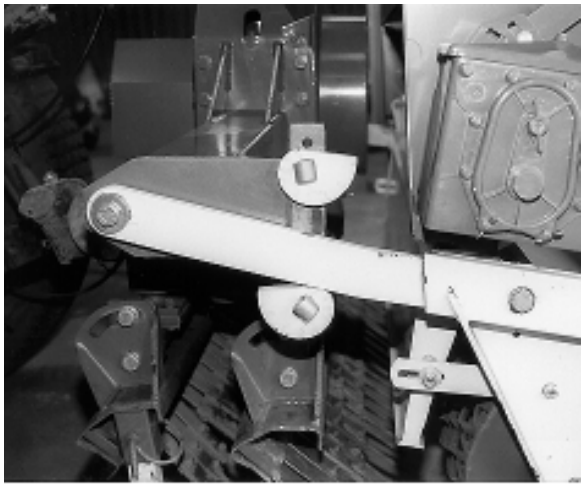

fig. 20

Adjustment of the upper eccentrics:

- Lift the machine until the upper eccentrics are no longer in contact with the support bars.

- Detach the locking screws of the eccentrics by means of the crank handle (Fig. 21).

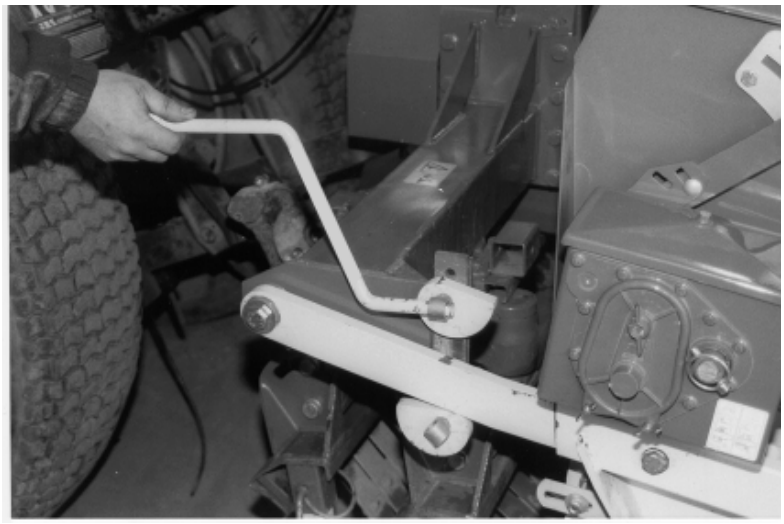

fig. 21

- Adjust the desired height on the basis of the figures (which do not indicate the actual height but only serve as a reference).

- Tighten the locking screws again.

The two upper eccentrics must be adjusted in the same way to achieve a regular performance.

By means of the lower eccentrics it is possible to block the support bars and thus to shift the weight of the roller to the harrow. This possibility is used when the machine is operated on very hard and consolidated grounds where the teeth penetrate the soil insufficiently.

Adjustment of the lower eccentrics:

- Adjust the working height by means of the upper eccentrics.
- Lower the lifted machine until the harrow is in operating position.
- Detach the locking screws of the lower eccentrics.
- Turn the lower eccentrics until the support bars are blocked (Fig. 22/1).
- Tighten the locking screws again.

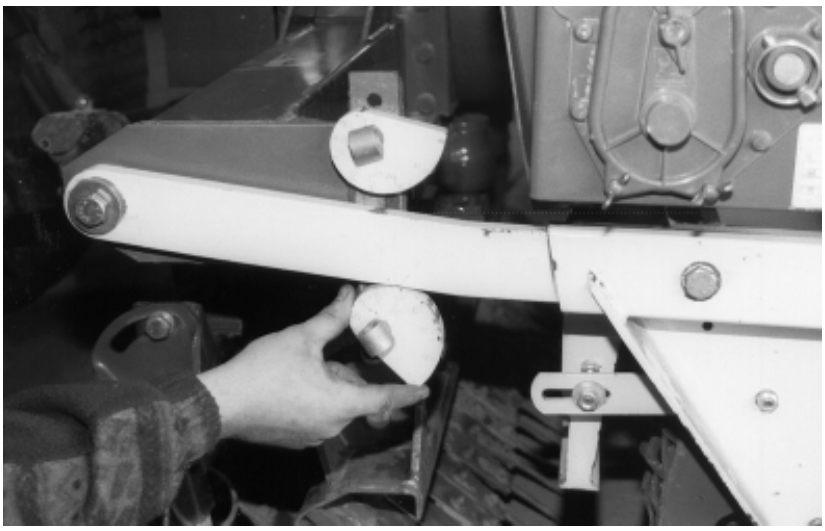

fig. 22

7.2.2 Adjustment of lateral weeders

After the working depth has been regulated, the lateral weeders situated at the outer ends of the front rack have to be adjusted.

Procedure:

- Let the power take-off turn, and lower the machine until it is in operating position.

- Block the power take-off.

- Detach the locking screws of the weeders.

- Adjust the weeder in such a way that it is approx. 2 cm above the soil (Fig. 23).

- Tighten the locking screws again.

The lateral weeders must never penetrate the soil during operation since they would then form a little groove.

fig. 23

7.2.3 Control and adjustment of tracking bars

The AMAZONE Combination Seeding System can be equipped with tracking bars for ensuring a very precise seeding operation so that already seeded rows are not overseeded.

Adjustment of tracking bars:

- Remove the cable from the safety hook (Fig. 24).

- Tilt the tracking bars.

- Fasten the cable to the hook which is welded to the angle section of the support bracket (Fig. 25).

fig. 24

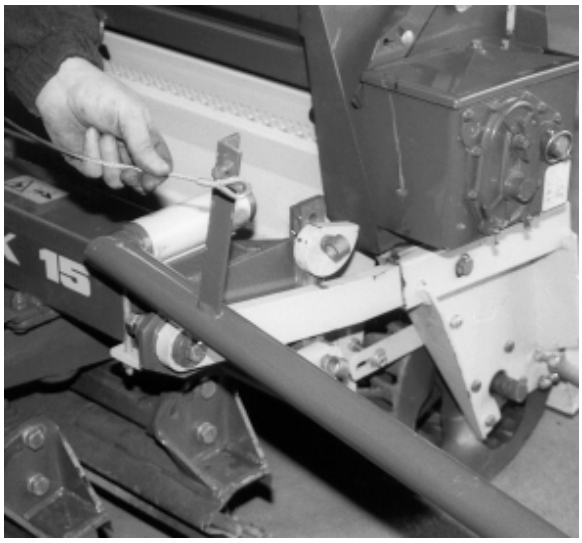

fig. 25

a) Tracking on the basis of the tractor path

$$A = \text{Working Width of GBK} - \frac{\text{Tractor Path}}{2}$$

Example: Tractor Path ..... 1.25 m
Working Width GBK 20 ..... 2.00 m

$$A = 2.00 - \frac{1.25}{2}\ m = 137.5\ cm$$ (Fig. 26)

b) Tracking on the basis of the tractor centre

$$A = \text{Working Width of GBK}$$

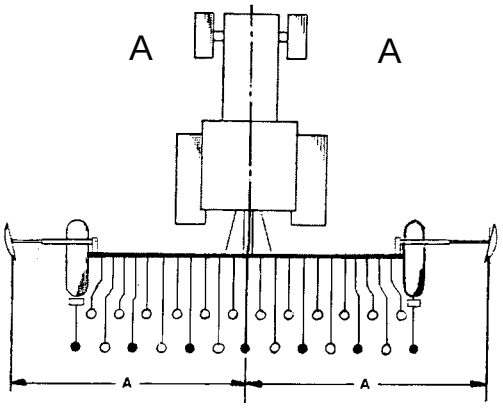

fig. 26

To adjust the tracking bar on the basis of the dimension figure A you only have to detach the locking screw by means of the crank handle and to shift the tracking bar on its support until it has reached the desired figure (Fig. 27 A).

To ensure an effective tracking it is necessary that the tracking bar penetrates the soil in a depth of 3 to 5 cm.

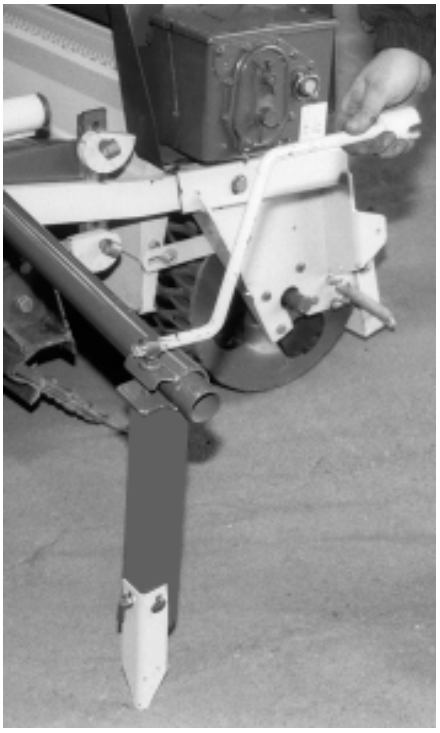

fig. 27 A

The longitudinal slot at the point of the tracking bar allows a vertical adjustment if the fastening screw has been loosened beforehand.

Control of tracking bars

The adjusting lever fastened at the three upper points of the harrow allows you to tilt either the one or the other tracking bar by moving the lever to the right or to the left

C A U T I O N ! ! !
The tracking bars have to be folded into transport position as soon as they are no longer used in order to ensure that the tracking points are not exposed to premature wear and tear. In order to do so, fold the tracking bars towards the inside and fasten the cable at the safety hook (Fig. 27 B).

fig. 27 B

7.2.4 Chute adjustment

The chute allows you to distribute the seeds regularly by guiding the seeds towards the soil and avoiding that they are blown away by the wind.

The seeding depth is variable and depends on the inclination of the chute.

Operating principle

During operation, a great or less pronounced accumulation of soil is formed behind the harrow depending on the working depth and the running speed. If the chute is inclined towards the rear (i. e. towards the screen roller) the seeds are distributed on the surface of the soil. However, if the chute is inclined towards the front (i. e. towards the harrow) the seeds are worked into the soil and can penetrate the soil at a depth of up to 3 - 4 cm.

To incline the chute:

- Detach the two nuts M10 on both sides of the chute (Fig. 28);
- Incline the chute to the desired position;
- Tighten the two nuts M10 again.

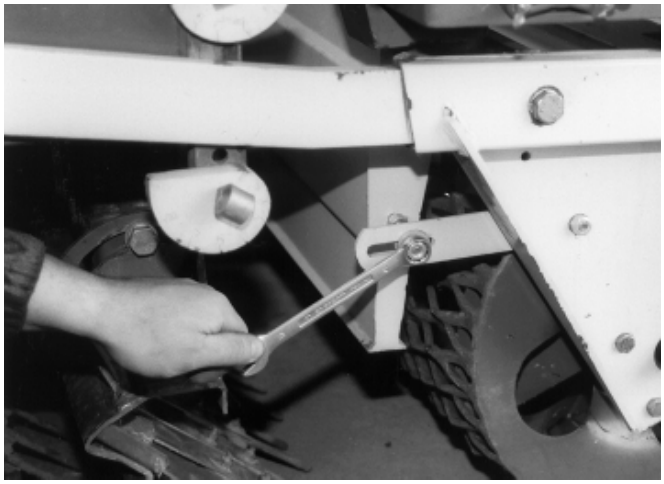

fig. 28

7.2.5 Levelling blade

The reciprocating harrow can be equipped with a levelling blade (option) by means of which the surface of the soil to be worked can be shaped. The levelling blade is to be adjusted as follows:

- Detach the locking screws at each support (Fig. 29).
- Remove the pin and the guiding axle.
- Adjust the levelling blade to the desired height.
- Restore the guiding axle and the pin (Fig. 30).
- Tighten the locking screws again.

fig. 29

fig. 30

8. AMAZONE GNK Overseeder

8.1 Fields of application

With the AMAZONE GNK Overseeder it is possible to overseed already existing lawns, such as e. g. sports fields, fairways, parks, etc.

The pick-ups at the pick-up bracket are a combination of spring blades and a round bar of spring band steel assembled in such a way that:

- if perpendicular to the direction of motion, they are rigid and ensure good loosening of the surface layer, however, without damaging the healthy lawn,

- if in accordance with the direction of motion, they are flexible and can retract when obstacles, such as stones, roots, etc., are in their way.

Before overseeding, it is recommended to mow the lawn to a very short length (2 to 3 cm) and to carry out a scarifying operation if the lawn is strongly interspersed with moss and plants growing wild.

8.2 Working with the Overseeder

8.3 Harrow working depth adjustment

See chapter 7.2.1.

8.4 Adjustment of overseeding tine bars

By adjusting the inclination of the overseeding tine bars, they can produce more or less aggressive operation depending on the state of the surface to be worked.

This adjustment can be carried out as follows:

- Couple the machine to the tractor (see Chapt. 4.1.2)
- Lift the machine,
- Remove the storing supports:
  - Remove the pin.
  - Remove the axle.
  - Detach the support.
  - Fasten the support to the storing pedestal (Fig. 31).
- Detach the fastening screws on both sides of the pick-up bracket (Fig. 32).
- Incline the pick-up bracket to the desired position.
- Tighten the fastening screws again.

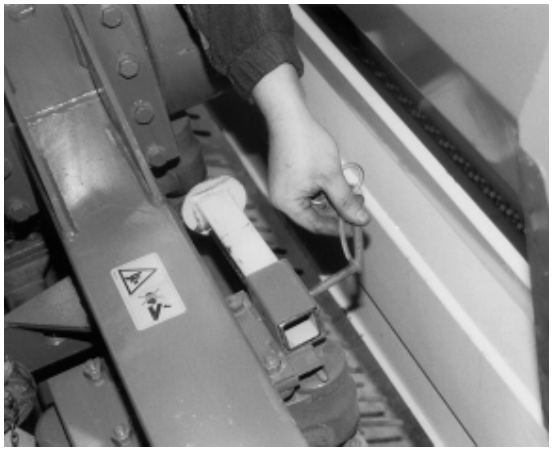

fig. 31

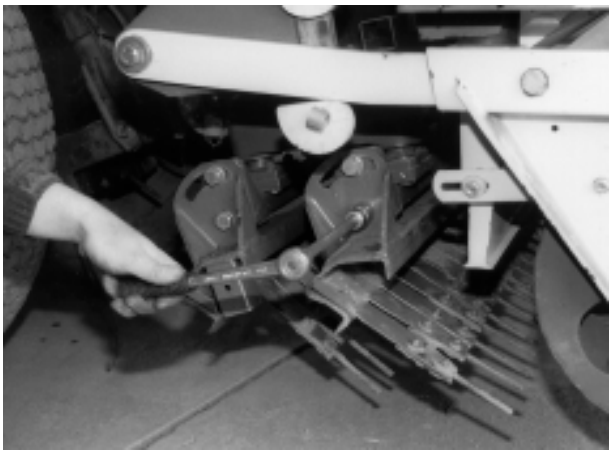

fig. 32

8.5 Chute Adjustment

See chapter 7.2.4.

9. AMAZONE HR Conditionmaster

9.1 Fields of application

The AMAZONE HR Conditionmaster is composed of the reciprocating harrow and the flat roller being equipped with lateral brushes and a rear brush. By exchanging the different bars, the Conditionmaster HR can carry out the following work:

- Regeneration of consolidated surfaces, tracks, grounds and promenades.

- Weekly maintenance of consolidated surfaces and tracks.

- Maintenance of sandy artificial lawn.

9.2 Working with the Conditionmaster

9.3 Regeneration of consolidated ground

By equipping the harrow with rigid bars, the Conditionmaster regenerates and levels the soil and reconsolidates the upper 3 - 4 cm of the top soil. After its application, consolidated soils regain their flexibility and permeability for surface water.

9.4 Harrow working depth adjustment

See chapter 7.2.1.

9.5 Adjustment of Lateral Weeders

See chapter 7.2.2.

9.6 Adjustment of lateral brushes

The lateral brushes prevent a furrow from being formed along the worked rows. To obtain an optimum efficiency, the brushes must be adjusted to a distance of approx.1 cm from the worked surface.

To adjust the lateral brushes:

- Lower the machine to its operating position while allowing the power take-off to turn gently.
- Stop the power take-off and switch off the tractor.
- Adjust the height of the brush by means of the set screws (Fig. 33/1).
- Tighten the set screws with the locknut.
- By means of the fastening screw (Fig. 34) it is possible to adjust the inclination of the brush.

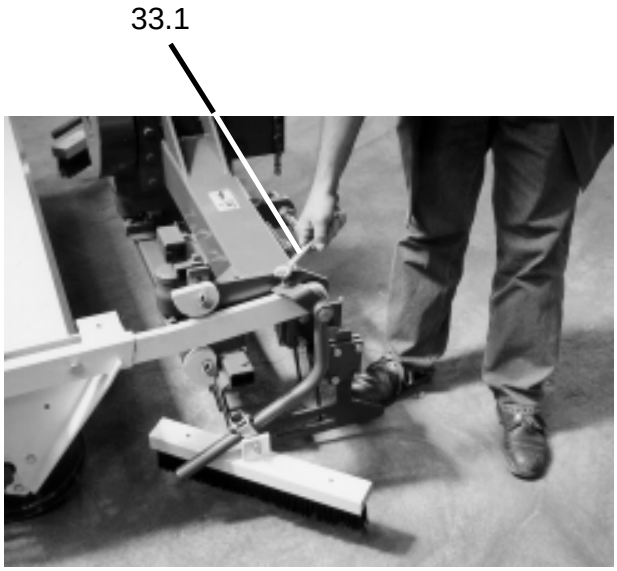

fig. 33

fig. 34

9.7 Adjustment of rear brush

The rear brush eliminates all traces and makes the worked surface look flat simply by its dead weight. This brush is adjusted as follows:

- Lower the machine to its operating position.

- Lower the brush to its operating position (Fig. 35).

- For transport purposes, lock the brush in the upper position (Fig. 36).

When the machine is lifted, the brush is lifted as well. When the machine is lowered, the brush automatically returns to its initial position.

fig. 35

fig. 36

9.8 Application on hard and very solid grounds

To thoroughly loosen very solid ground the support bars must be blocked by means of the eccentrics, thus shifting the weight of the roller to the harrow (see Chapt. 7.2.1). It may happen that the teeth of the harrow cannot penetrate the soil.

Remark:

To regenerate a consolidated soil it must have a certain degree of moisture, e. g. as it is the case after one or two days of rainfall. An application under too dry conditions leads to premature wear and tear of the teeth.

9.9 Weekly maintenance of consolidated ground

Weekly maintenance of consolidated ground consists of combing, brushing and reconsolidating the top soil at a depth of 1 to 2 cm. These maintenance operations are carried out with the HR Conditionmaster, with the rigid bars of the harrow being replaced by a combination of a pick-up bracket in front and a pick-up bracket at the rear side of the harrow.

9.10 Adjustment of front pick-up bracket

For weekly maintenance of a consolidated ground, it is recommended to adjust the pick-up bracket in a position where it is as inclined as possible. If you wish your work to be carried out a little more aggressively, the inclination of the overseeding tine bars should more or less approach the perpendicular. Adjustment of inclination is described in Chapt. 8.4.

9.11 Adjustment of rear brush bracket

For weekly maintenance of consolidated ground, the brush bracket mounted on the rear side of the harrow brushes and levels the top soil which has beforehand been combed by the pick-up bracket. The rear brush bracket must be adjusted in such a way that the brushes gently touch the soil when the machine in operating position. Adjustment is done as described below:

- Lower the machine to its operating position.

- Detach the two locking screws on both sides of the brush bracket (Fig. 37).

- Position the brush bracket to the desired height and lock it in this position by means of the locking screws.

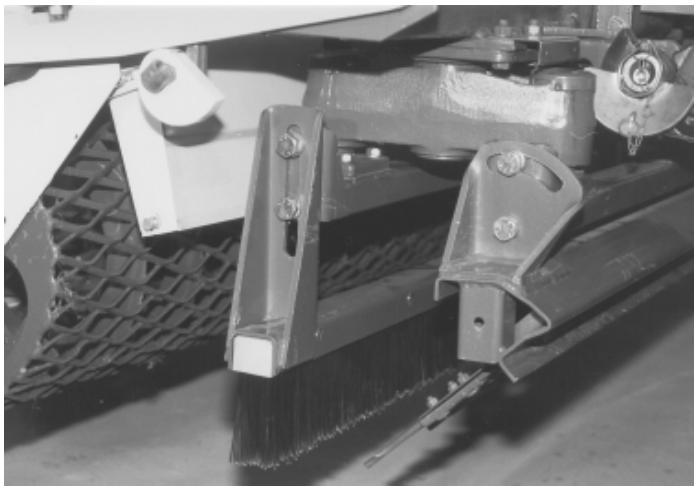

fig. 37

9.12 Maintenance of sandy artificial lawn

To brush the sand from artificial lawns and to regularly maintain them it is sufficient to mount the brush bars at the front and rear sides of the harrow. The brushes level the traces of the operating equipment after its use and allow the sand possibly scattered over the lawn to be brushed away. The ground is accessible immediately after the operation of the HR Conditionmaster.

9.13 Adjustment of brush bars

When applied on sandy artificial lawn, the two brush bars must be adjusted to the same working height. Adjustment is done as described in Chapt. 9.11.

10. Further Soil Cultivation Equipment

The AMAZONE Combination Seeding System (roller + seeder) can also be adapted to a rotary harrow or to a stone burier (see Chapt. 5.4).

10.1 Seeding system with rotary harrow

10.1.1 Mounting and adjustment of the rotary harrow

The ”three-point” coupling hooks below the harrow are horizontally adjustable in the driving direction of the machine. They can also be mounted towards the outside or towards the inside. By means of these different adjustments it is possible to mount the reciprocating harrow on any type of tractor.

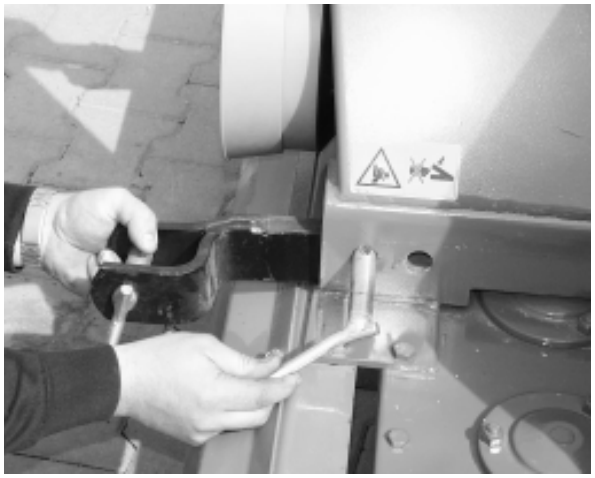

fig. 38 A

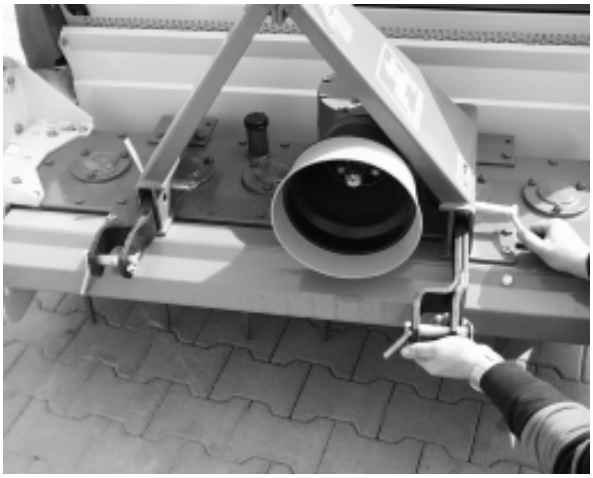

fig. 38 B

The coupling bars below the tractor must be tightened, however, a slight lateral movement of the harrow must still be possible.

The upper tie rod of the coupling has to be adjusted in such a way that the rotary harrow is horizontal or slightly inclined towards the back when in operating position. Caution: The machine must never be inclined towards the front.

Take care that there is nobody behind or beneath the machine since the machine can swing out at the back if both parts of the upper tie rod work loose or break loose by mistake.

Lowering of the machine must take at least two seconds. Adjust the lowering limit switch, if any, accordingly. Smoothly put the loaded machine on the ground.

10.1.2 Cardan shaft

Only use the cardan shaft prescribed by the manufacturer !

Walterscheid W 2300 SD 15-610 K34B-110
up to 1,30m working width

Walterscheid W 2400 SD 25-610 K34B-120
from 1,50m working width

Torque limiter

The cardan shaft delivered with the tool is fitted with a torque limiter which protects the various transmission components when a stone blocks the moving teeth. The use of a cardan shaft different from the one recommended by the manufacturer makes the warranty void in case of damage associated with cardan shaft protection.

10.1.3 Cardan shaft mounting

See § 4.1.4

10.1.4 Cardan shaft adjustment by coupling the machine for the first time

See § 4.1.5

10.1.5 Speed at the entry of the angular gear casing

See § 4.1.6

10.1.6 Working depth adjustment

The working depth is set using adjustment links located on each side of the rotary harrow. To do this, put the stop bolt in one of the drilled holes (fig. 39) according to the working depth desired. Adjustment links must be set on each side in the same manner.

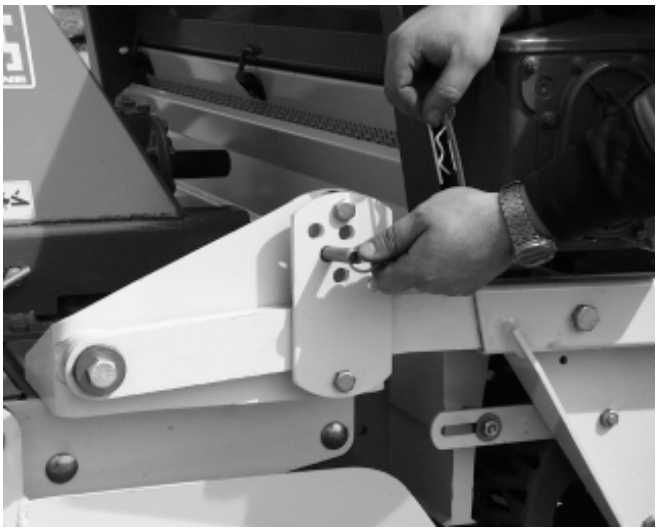

fig. 39

10.1.7 Adjustment of lateral weeders

Lateral weeders prevent earth ridges from forming on each side of the cultivated area. They must be adjusted so that they are flush with the ground.

Adjustment of lateral weeders:

- Lower the lift until the tool is in weeding position.
- Loosen the butterfly nuts.
- Adjust the weeder in the desired position.
- Tighten the butterfly nuts.

10.1.8 Greasing

After the first 50 hours of operation, change the oil of the final drive by draining it using the drain plug (item S, fig. 40).

Clean the inner part of the final drive with gas oil or kerosene. Fill the oil case (see characteristics in table below) through the filling plug (item C, fig. 40) up to the level plug (item L, fig. 40).

Repeat this operation every 300 hours of operation.

The level of grease contained in the gear casing must be regularly checked. This visual check is through the filling plug: the grease must entirely cover the gear trains.

	OILS	**GREASES**
AGIP	Blasia 150	Gr Mu EP 0
BP	Energol GR-XP 150	Grease LTX 0
CASTROL	Alpha SP 150	Spheerol EPL 0
ELF	Reductelf 150	Rolexa 0
ESSO	Spartan EP 150	Beacon 0
MOBIL	Mobilgear 630	Mobilplex 0
SHELL	Omala oil 150	Alvania grase R 0

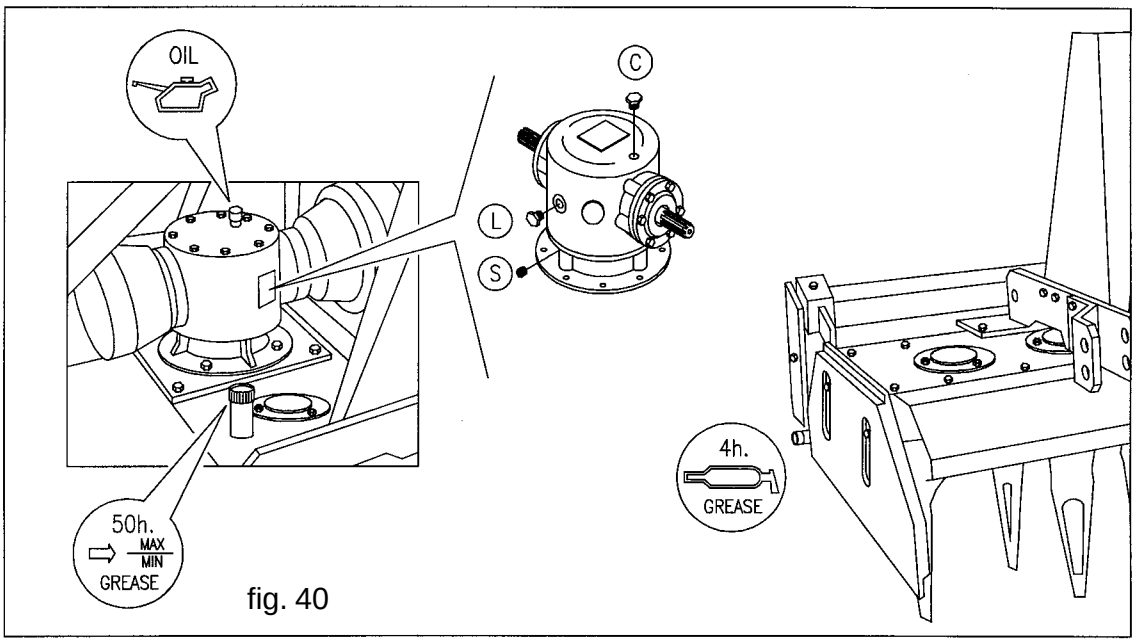

fig. 40

10.1.9 Maintenance

Daily checks:

- Block the coupling arms of the tractor.

- Check tightening of all bolts and, in particular, the central teeth carrier locknut.

- Check tightening of the teeth attachment screws. Damaged teeth must be replaced immediately. Refer to chapter 10.1.10.

10.1.10 Teeth replacement

The teeth of the rotary harrow are important components, the subject of special attention during design so as to combine perfect harrowing and easy removal. Access to attaching parts is very easy.

To replace the teeth, block the tool beforehand using sturdy wedges that you will position on each side under the harrow frame, this to avoid any unwanted lowering of the tractor lift.

To change a tooth, unscrew and remove both attachment screws (items 1, 2 and 3 - fig. 41 B). To install, use an air-powered wrench, then torque the screws correctly by hand using an open-end wrench and a 1-meter lever arm (fig. 41 A).

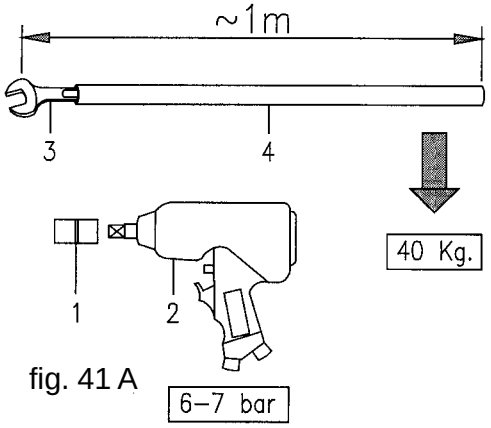

fig. 41 A

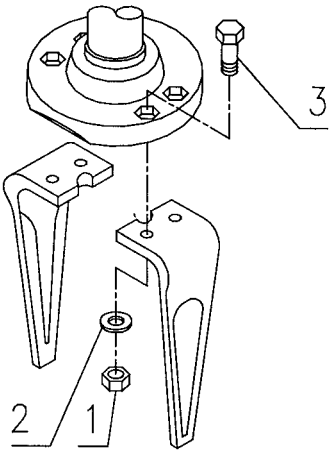

fig. 41 B

10.2 Seeding system with stone burier

10.2.1 Mounting and adjustment of the stone burier

Connect the coupling arms of the tractor to the coupling jaws of the tool using locking pins and bolts. The upper tie rod of the coupling has to be adjusted in such a way that the tool is more or less horizontal when in operating position.

10.2.2 Cardan shaft

Only use the cardan shaft prescribed by the manufacturer !

Walterscheid W 2300 SD 15-610 K34B-110
up to 1,30m working width

Walterscheid W 2400 SD 25-610 K34B-120
from 1,50m working width (standard model)

Walterscheid P 500 PG 20-710 EK64/2R-200
from 1,50m working width (heavy duty model)

Torque limiter

The cardan shaft delivered with the tool is fitted with a torque limiter which protects the various transmission components when a stone blocks the moving blades. The use of a cardan shaft different from the one recommended by the manufacturer makes the warranty void in case of damage associated with cardan shaft protection.

10.2.3 Cardan shaft mounting

See § 4.1.4

10.2.4 Cardan shaft adjustment by coupling the machine for the first time

See § 4.1.5

10.2.5 Speed at the entry of the angular gear casing

See § 4.1.6

10.2.6 Adjustment of the working depth

The working depth is set using adjustment links located on each side of the tool. To do this, put the stop bolt in one of the drilled holes (fig. 42) according to the working depth desired. Adjustment links must be set on each side in the same manner.

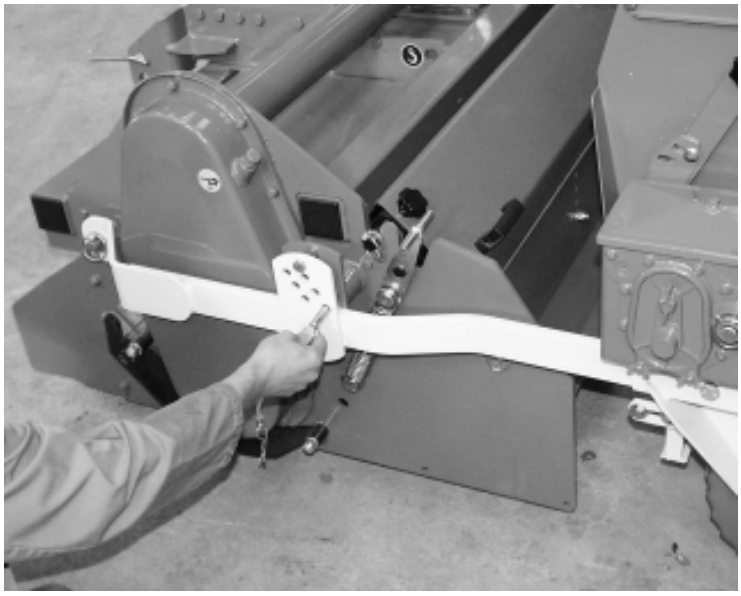

fig. 42

10.2.7 Starting

Choose an area freshly and properly prepared or in-depth decompacted by a trailing-tooth tool of the ripper or weeder type. Remove large stones and detritus.

For trouble-free burying in the future, detritus must not exceed 5/6 cm in diameter (if you follow this logic, you will always have perfect lawns, healthy soil and equipment in perfect order, at a low cost).

CAUTION: TO CARRY OUT THIS OPERATION, NOBODY MUST STAND BEHIND THE TOOL AND AN OPERATOR MUST STAY ON THE TRACTOR (as the rotor turns backwards, the tractor and the tool may move backward).

To start the work, proceed as follows:

- **FIRMLY BLOCK THE TRACTOR BRAKES,**
- bring the rotor down to ground level,
- engage the PTO clutch,
- set the engine speed corresponding to 540 rpm, slowly and completely release the tractor lift,
- turn off the engine and remove the key,
- adjust the working depth (with the side plates parallel to the ground). If necessary, correct with the 3rd point. Plates must go 2 to 3 centimeters deep into the ground.

- lift the tool so that the rotor is slightly above the ground.

- for the first tests, select the gear corresponding to a forward movement of approximately 1,000 to 1,200 meters an hour. Slowly e engage the clutch and position the tool simultaneously.

THE LIFT MUST BE FULLY LOWERED AND FLOATING.

- If the rotor is jammed by a large stone, disengage the pto clutch without lifting the tool and move forward until it comes out. If necessary, jolt with the lift.

NEVER GO UNDER THE TOOL TO REMOVE THE STONE FROM THE ROTOR!!!

- If unable to rotate the rotor, remove the leveling cover by unlocking fasteners located on the right and left handsides of the cover (fig. 43).

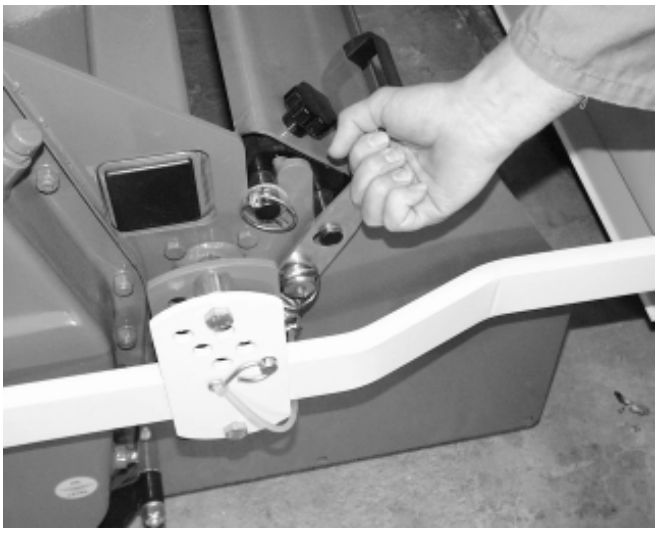

fig. 43

- completely remove the selection grille (fig. 44),

- remove the blade which is blocked by the stone or the obstacle,

- remove the obstacle and install the blade.

fig. 44

10.2.8 Driving

Good work is obtained when the tool follows the contours of the ground as closely as possible. To do this, use the 3rd hydraulic point, the coupling cylinders oscillating or, failing that, lightly operate the tractor lift to take up the ball joint play. However, in this case, the work is not correctly performed because, since the roller is relieved, the packing density is uneven and may be detrimental to work quality.

When in-depth work is performed, to avoid joints and track-shoe marks, IT IS PREFERABLE TO HAVE THE FINISHED GROUND TO THE RIGHT OF THE TRACTOR

10.2.9 Stone burier principle

Blades work in the ground from the bottom up by creating an excavation. The material thus removed is projected against the preselection grille which collects stones and detritus more than 4 centimeters in diameter in the bottom part of the excavation made by the rotor, the second grille placing finer materials on top.

The screened fine soil is placed on top by the leveling cover ensuring an even distribution, while the tool is supported by the refining roller which ensures depth adjustment through packing without smoothing, which is ideal for lawn seeding.

We remind you that, to obtain quality green spaces, the ground must be in-depth decompacted to favor drainage and good lawn rooting. We recommend that you use a ripper or weeder before using the stone burier. This will save you time on the burying operation, and money by taking some of the workload of the coupling. You will also be certain to satisfy your most demanding customers.

As rotation is in reverse with regard to the driving direction, whatever the rotor encounters goes through the tool. “Therefore, stones and objects the size of which is incompatible with the burier used must be eliminated during preparation and decompacting work”.

Because large objects may have escaped the operator’s notice, it is most important to use the tool only with the safety cardan shaft transmission (cam limiter) delivered with the tool.

NOTES

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....