



# Operating Instructions

Seed Drill  
TURBODRILL A

**RABE  WERK**



## EC Declaration of Conformity

according to Directive 89/392/EEC

We

**RABEWERK GmbH+Co.**

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Am Rabewerk, D-49152 Bad Essen

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declare under our sole responsibility, that the product

Seed Drill TURBODRILL A

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to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive 89/392/EEC.

"The Supply of Machinery (Safety) Regulations 1992 as amended" have been respected.

For the relevant implementation of the safety and health requirements mentioned in the Directive, the standard EN 292 has been respected.

Bad Essen,

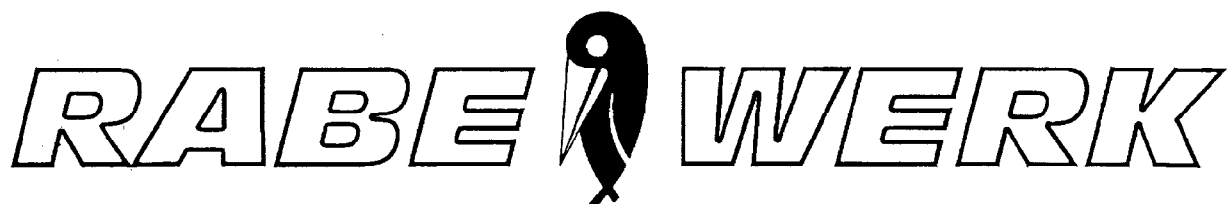
24.11.94

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## Operating Instruction

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### FOR SEED DRILLS Turbodrill A

#### **Before use**

Ensure operators have read and are familiar with the instructions contained in this manual and the seed drill is not operated by untrained persons.

The seed drill is a power-take-off driven implement for drilling seed and is designed for normal agricultural work. Use the seed drill only for the purpose for which it was designed and tested and in accordance with the instructions contained in this handbook.

**Caution:** Warranty will be invalid if the machine is improperly used or non-genuine parts or any other parts or components are fitted which are not released by RABE WERK.

Only authorized and skilled RABE WERK dealer technicians, national distributors and our own factory service engineers are allowed to undertake repairs under warranty.

**Important:** The operator must carry out regular checks to ensure that the seed coulters are not blocked and that seed flow is unhindered.

**RABE WERK accept no liability for consequential damages or losses of any kind.**

#### **Safety Precautions**

**Warning.** Make certain that all guards, covers, warning labels and safety devices are correctly fitted and operative.

Ensure the seed drill is standing on firm, level ground with the parking stands in lowered position and the work area is clear of bystanders.

**Warning.** Select 'Position Control' on the tractor hydraulic before mounting or disconnecting machine.

Take care that sufficient front end weights are fitted on tractor particularly with full hopper to compensate the rear mounted implement.

Never allow people to stand, sit on machine, or the filling platform.

Never touch any moving parts which may be hot from operation.

Ensure that the selected PTO speed of tractor is in accordance with the permitted 1000 rpm of the seed drill.

Ensure that the PTO drive shaft tubes and sliding profiles do not separate at the longest working length or jam at its shortest.

Never leave the tractor seat or carry out work unless the implement is fully lowered to the ground, the PTO drive is disengaged, the gear shift is neutral, the handbrake applied, the engine stopped and the ignition key is removed.

### **Brief description of seed drill**

The RABEWERK TURBODRILL in 3 to 6m width, is a pneumatic seed drill which can be mounted onto a PTO driven implement by means of an A-frame or directly behind the tractor with a solo 3-point-hitch.

The seed from the hopper is metered centrally at exactly the correct seedrate per hectare for the overall working width and then uniformly divided between the rows. The metering is effected from a ground wheel running on the cultivated soil. The air for the transport of the seed via the distributor head to the seed coulters is produced by a PTO driven blade wheel blower.

By means of a central and simple change-over control from large/medium to small seed and due to an infinitely adjustable oilbath gearbox different kinds of seed against the required seedrate are sown. With an optional available hydraulic seedrate control the seedrate can be changed on the move.

Change-over from the standard universal coulters to (optional) bandseed- or single disc coulters is achieved, by an unique concept, without the use of tools.

The pressure on the coulters can be adjusted individually on each coulters and central manually or also hydraulically (optional) during work.

The hydraulically controlled marker set can be adjusted to mark either on the wheel mark or central to the tractor. The marker control unit controls the electronic tramline system and the pre-emergence set.

A wide range of optional equipment, the simple and comfortable operation and low down time due to the quick and easy way of calibration and emptying of the hopper makes the RABEWERK TURBODRILL, in combination with a RABEWERK Rotary Harrow to an economical drill-cultivation unit for one pass.

### **Standard Equipment** (may vary from country to country)

- A-frame (1/2), belt pulley (1000 rpm) with double V-belt
- Seed hopper (950 or 1400 l) with low level indicator
- Turbo blower with pulley
- Ground metering wheel
- Infinitely adjustable oilbath gearbox
- Central metering unit for small and medium to large seeds
- Rotating agitator with detachable agitator fingers

- Calibration device
- Distributor head with 2-way outlets for tramlining (to the coulters or back into hopper)
- Universal/ Suffolk coulters (exchangeable) with anti-bloc device
- Central- and individual coulters pressure adjustment
- Set of hydr. disc markers (400 mm) with shearbolt overload protection for wheel and centre marking
- 2 Parking stands

### **Optional equipment**

- Various types of loading platform
- Coulter harrows or devided following harrow in two rows with dragging tines
- PERFECT- following harrow with individually springloaded harrow sections
- Electronic tramline control FG
- Auto. pre-emergence marker set (400 mm discs) with two or one disc only
- Hydraulic coulter pressure adjustment
- Hydraulic seedrate control (on the move)
- Hectare meter
- Bandseed coulters (band of appr. 8,5 cm)
- Single disc coulter
- Solo 3-point hitch c/w PTO 1000 rpm, PTO shaft and double track eradicators.  
Tyres 6.00-16 or 10.0/75-15, track width appr. 220 cm
- Over- run clutch for fan drive (for tractors with electric/ hydr. PTO engaging or PTO shaft with auto cut- out clutch
- Hydraulic fan drive
- Dust protection device
- Drill monitoring system for metering wheel, calibration flap, fan drive, hopper low level
- Hydr. vertical marker lift

### **Mounting Turbodrill on rotary harrow**

Fit A-frame and belt pulley on rotary harrow according to the seperate assembly instructions on page 15.

Ensure that the drive from the rotary harrow provides 1000 rpm and the A-frame is in exact upright position to the PTO through drive and the measure of 115 mm between pulley and A-frame has been observed.

### **Parking stands and A- frame** (Fig. 1 & 2)

With the TURBODRILL parked on its stands (1 Fig. A) and the rotary harrow attached to the tractor back up with tractor under the drill and lift rotary harrow to connect A- frames. Engage the latches (2 Fig. Ö) on either side of the A- frame. To avoid play on the A - frame the length is adjustable on the eyebolt according to the required tension. Remove the parking stands and lower the combination unit on to the ground.

### **Coulter rail** (Fig. 3)

The distance from the coulter rail to the rear roller of the rotary harrow should be as closed as possible. There are 3 hole positions provided (3 Fig. B1-3) to adjust the parallel mounting bars.  
For example:

3 Fig. B2 - Models MKE 301 + 401 also PKE, SKE and HKE

B3 - Models MKE 250 + 300 also with lever change gearbox

Also the coulter rail (bottom side) should be adjusted by means of the turnbuckle (3 Fig. B) with clearance to the ground of approx. 38 - 40 cm. This measure should be adjusted in the field with the seeddrill in work.

### **V-belt drive** (Fig. 4 & 5)

For fitment of V-belts or taking off slacken tensioner by means of turning crank (4 Fig. R) anti-clockwise. The locking bolt (4 Fig. R1) must be slackened before. To tension V-belts turn crank (4 Fig. R) clockwise. Tighten locking bolt (4 Fig. R1) again and counterlock. Replace V- belts only with genuine XPZ belts only in pairs and of the same length. After replacement re- check tension again after approx. 20 min. in work. In case of hydraulic fan drive study separate instructions.

### **Alignment of blower unit and V-belt drive** (Fig. 4)

The blower unit can be aligned by means of slackening bolts (4 Fig. R5 + R6) and shifted in line with the drive pulley. It is very important to align the blower precisely with great care to avoid damages on V-belts or jumping-off.

### **Hydraulic and electric supplies** (Fig. 5)

For the markers and for the hydr. coulter pressure is each one single acting spool valve required.

The electronic tramline control is operated with 12 Volts from a 7 terminal trailer plug on the tractor and only if the headlights are switched on in dimmed position.

To avoid misfunctions it is absolutely essential to hook the cable with the third loop into the provided holder ( Fig. 5) to relieve the plug connection.

### **Safety covers** (Fig. 2 & 7)

After fitting or tensioning of belts the safety covers as for the blower drive (2 Fig. R7) and the belts (5 Fig. R8) must be kept always in place.

### **Seedrate** (Fig. 8 & 9)

The metering unit consists of one big metering wheel (8 Fig. D) for large and medium (coarse) seeds and on either side with two fluted wheels (8 Fig. D1 + D2) for fine seeds. The seed rate is controlled by adjusting infinitely the speed of the gearbox by lever

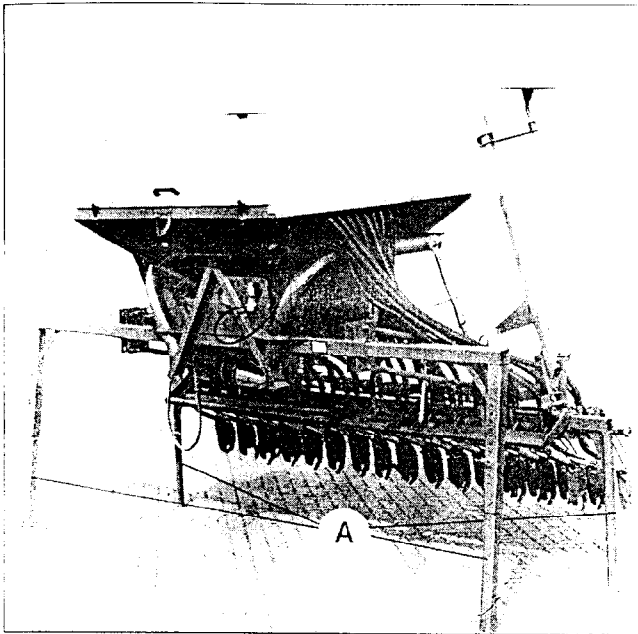


Fig. 1

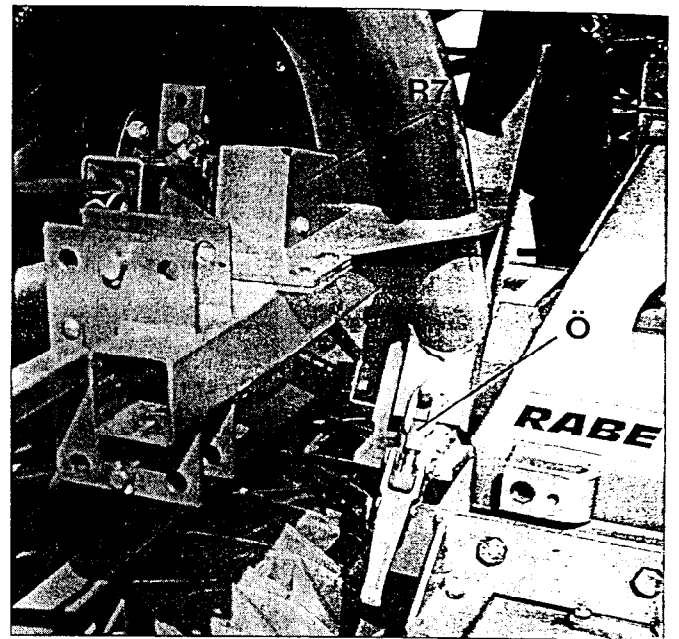


Fig. 2

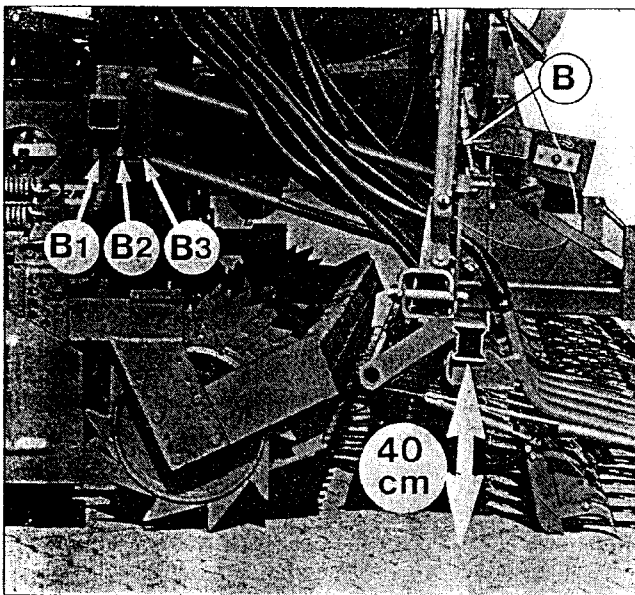


Fig. 3

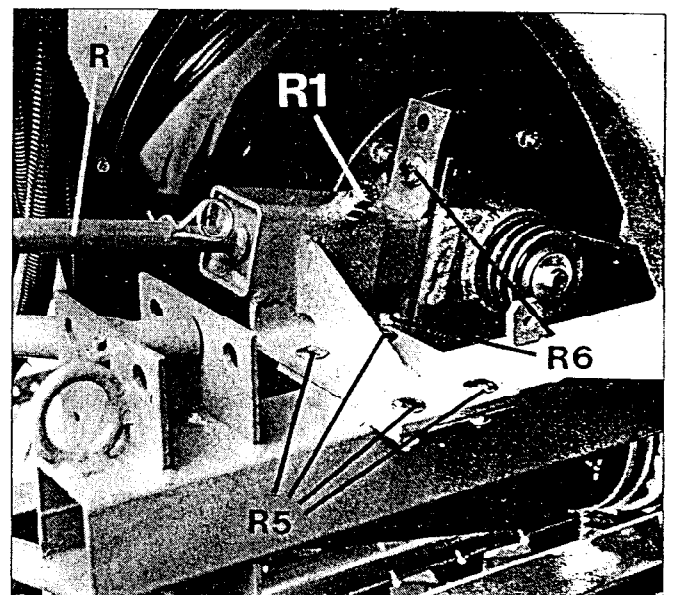


Fig. 4

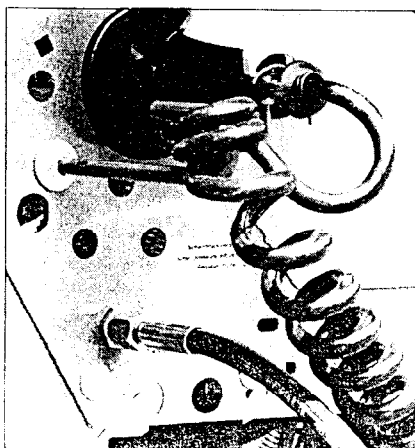


Fig. 5

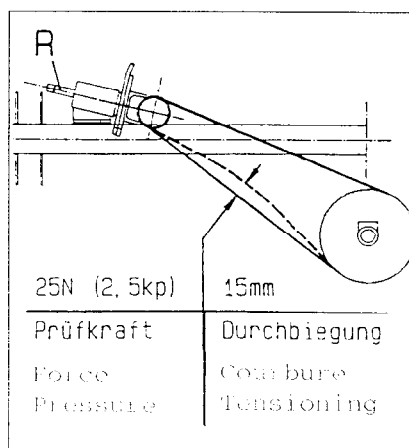


Fig. 6

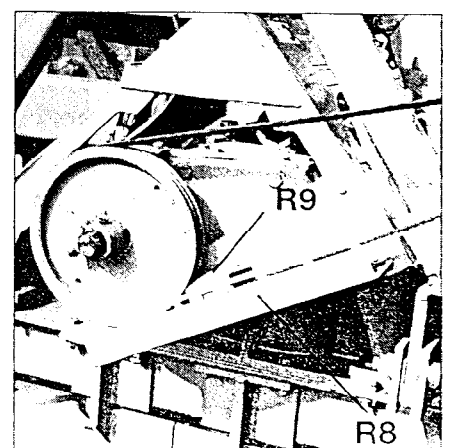


Fig. 7

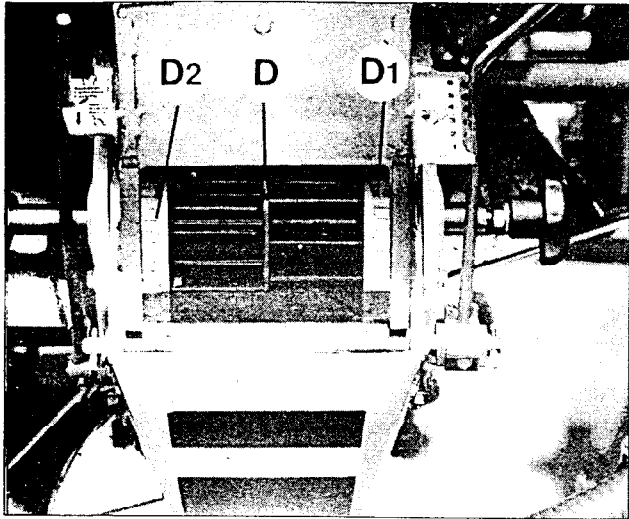


Fig. 8

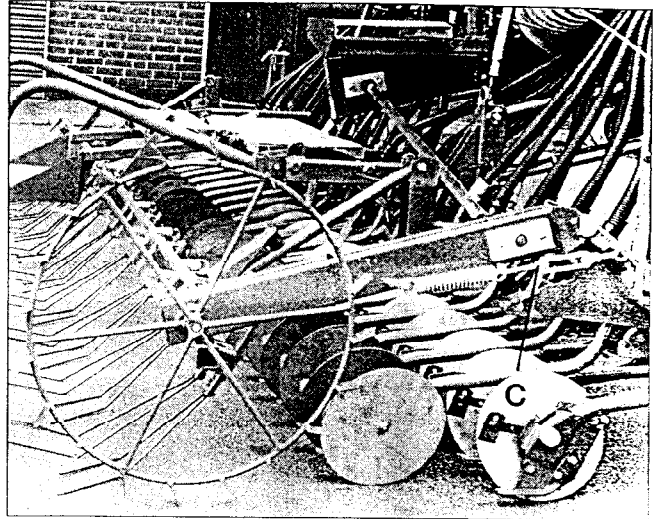


Fig. 9

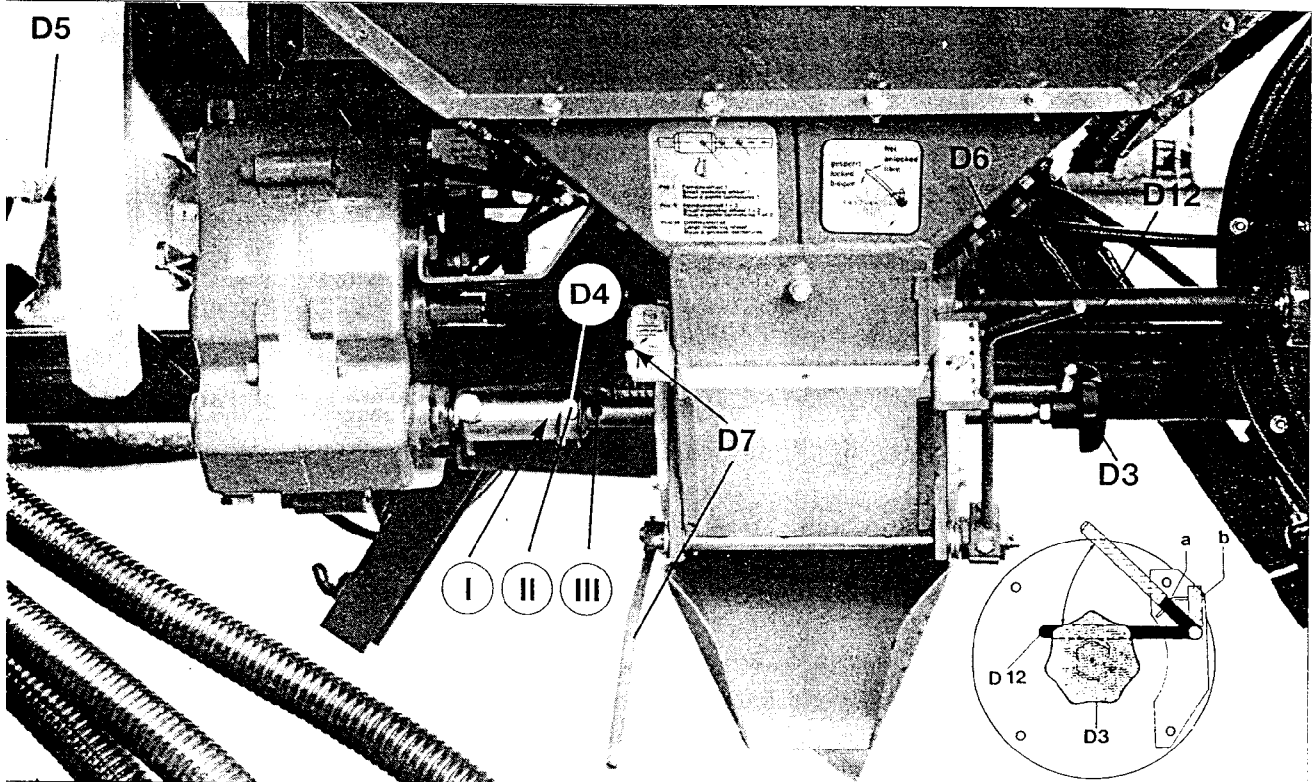


Fig. 10

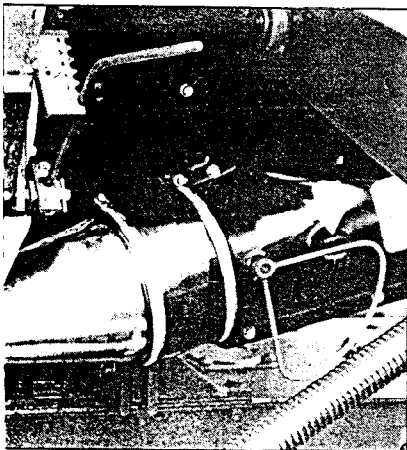


Fig. 11

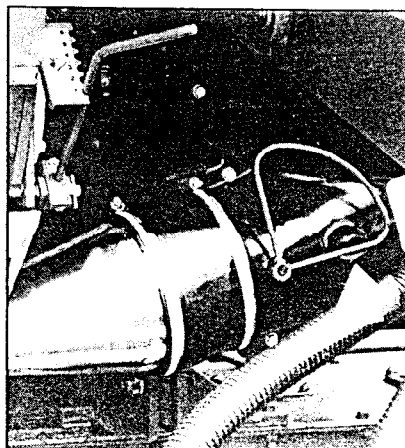


Fig. 12

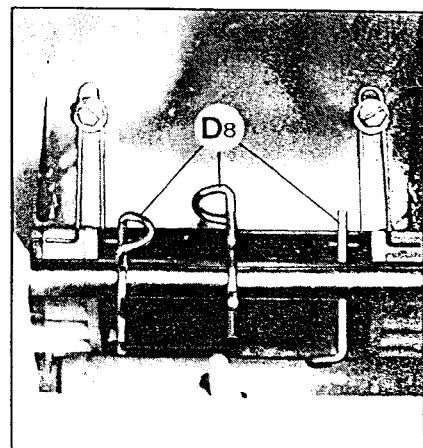


Fig. 13

(10 Fig. D5) The drive is effected from the ground wheel rotating on the cultivated soil. The ground pressure can be adjusted by means of a turnbuckle (9 Fig. C).

### **Seedrate adjustments (refer to calibration chart) Fig. 10**

Refer always to the calibration chart to find the necessary adjustments required for the different varieties of seed:

### **Position of metering wheels (Fig. 10)**

By means of turning the handle (10 Fig. D3) the shaft can be shifted, repositioned and then engaged with lynchpin (10 Fig. D4). When shifting the metering shaft put bottom flap in position 1.

Position I = One fine seed wheel engaged only (8 Fig. D1)  
Position II = Two fine seed wheels engaged (8 Fig. D1 + D2)  
Position III = Large metering wheel (8 Fig. D) engaged for standard/ coarse seed.

In position I and II (fine seed) the central metering wheel (8 Fig. D) must be locked out of work by the lever (10 Fig. D12 on drawing) situated at the r.h. side of the metering unit. There are two positions (re. drawing 10 Fig. D12).

Lever engaged at point (a): \* Fine seed wheels are free in position I or I + II  
Lever engaged at point (b): \* Central metering wheel is free in position III for coarse seed.

If it is difficult (10 Fig. D12) to engage the locking lever turn the large metering wheel a little by means of entering through the emptying shutter (14 Fig. D9).

### **Gearbox adjustment (10 Fig.)**

The speed of the oilbath gearbox is infinitely adjustable from 0-100 (0 = standstill). The rate is indicated on the scale above the metering lever (10 Fig. D5). For the hydraulic seedrate control refer to page 17/ Fig. 21.

### **Bottom flap (10 Fig.)**

The tension on the bottom flap can be adjusted with lever (10 Fig. D6). The best position is in accordance with the size of seed and is stated in the seedrate chart. The bottom flap is springloaded and can give way. In case cracking of seed is experienced open the bottom flap one position higher up than stated in the seedrate chart.

### **Air flow valve (Fig. 11 & 12)**

The air flow valve regulates the amount of air needed for the transportation of the seed.

For standard or coarse seeds put the handle in 'Open' position (Fig. 11). For fine seed in 'Closed' position (Fig. 12). In case of hydraulically driven fan (by oilmotor) keep the flow valve always open.

### **Calibration flap (Fig. 10)**

For calibration put the lever (10 Fig. D7) up. For work/ drilling is the bottom position.

### **Agitator shaft** (Fig. 13)

The agitator ensures uniform delivery of the seed (13 Fig. D8). The loop on the outer agitator fingers should be facing inwards.

Only for rape, peas or beans it is recommended to remove the fingers.

### **Calibration** (Fig. 14)

Emptying shutter (14 Fig. D9) must be in closed position. Remove agitator fingers if necessary, e. g. in case of oil seed rape.

Check correct positions according to seedrate chart:

- metering wheel position in work (12 Fig. D4)
- gearbox lever position (14 Fig. D5)
- bottom flap position (14 Fig. D6)
- air flow valve position (14 Fig. D10) as described under point 4.

Now the hopper can be filled with the seed.

Open the calibration flap (14 Fig. D7) with the lever in the top position and place a container underneath the discharge funnel.

Fit the calibration crank (14 Fig. D11) and rotate for some turns (min. 10 times) until the barrels of the metering wheels are all evenly full. Empty container once more and turn the crank anti-clockwise according to the number of turns stated in chart below. Total working width and number of rows have to be considered.

The seed delivered into the container can now be weighed.

### **Example for calculation**

Number of turns for 1/40 ha (250 m<sup>2</sup>): multiply by 40 = kg/ha

Number of turns for 1/10 ha (1000 m<sup>2</sup>): multiply by 10 = kg/ha

Width	Row spacing	No. of rows	Turns of crank handle	
			1/40 ha=250 m <sup>2</sup>	1/10 ha=1000m <sup>2</sup>
3,0 m	10,0 cm	30	42,3	16,9
	11,5 cm	26	36,6	14,6
	15,0 cm	20	28,2	11,3
4,0 m	10,0 cm	40	31,7	12,7
	11,8 cm	34	27,0	10,8
	13,3 cm	30	23,8	9,5
	13,3 cm*	30	31,7	12,7
	15,4 cm*	26	27,5	11,0
4,5 m	11,3 cm	40	28,2	11,3
	12,5 cm	36	25,4	10,2
	15,0 cm*	30	28,2	11,3
5,0 m	12,5	40	25,4	10,2
6,0 m	15,0	40	21,1	8,5

\* 30 Distributor head outlets

Because of the differences in specific weight, size and form of seed or treated seed, the figures stated in the calibration chart can only be used as a guide. It must be checked once more by physical calibration test with a different position of the metering lever (9 Fig. D5).

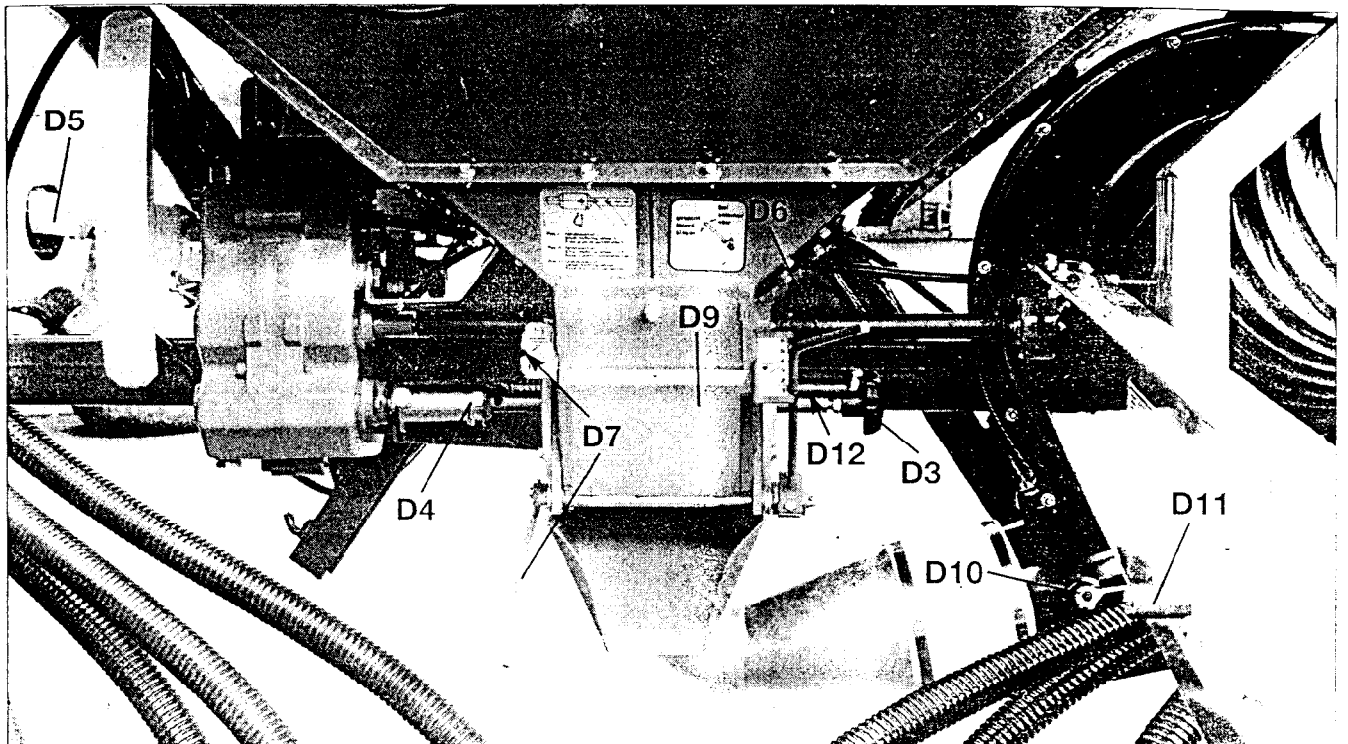


Fig. 14

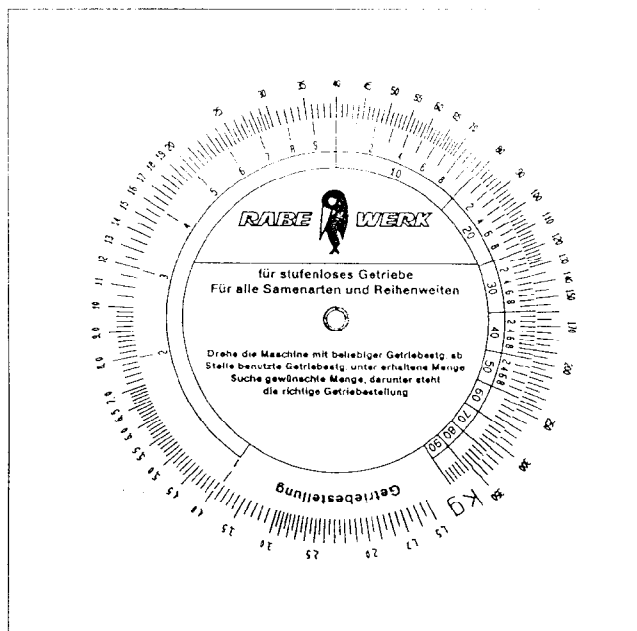


Fig. 14 a

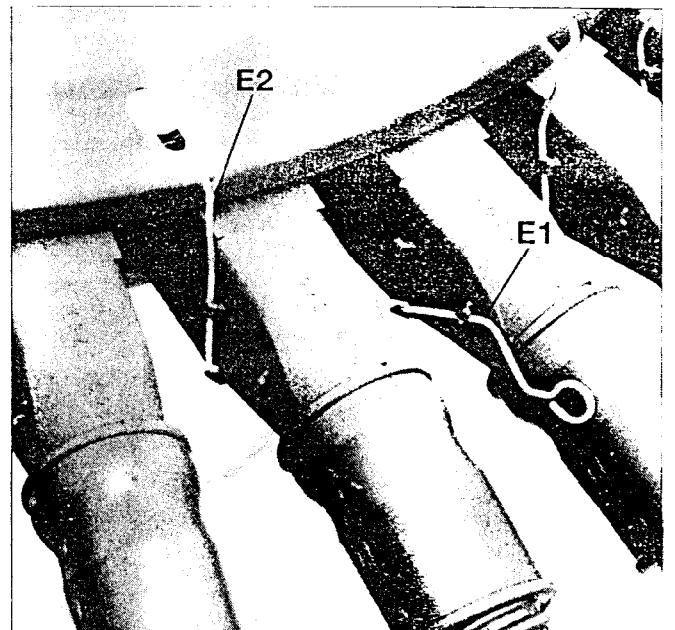


Fig. 15

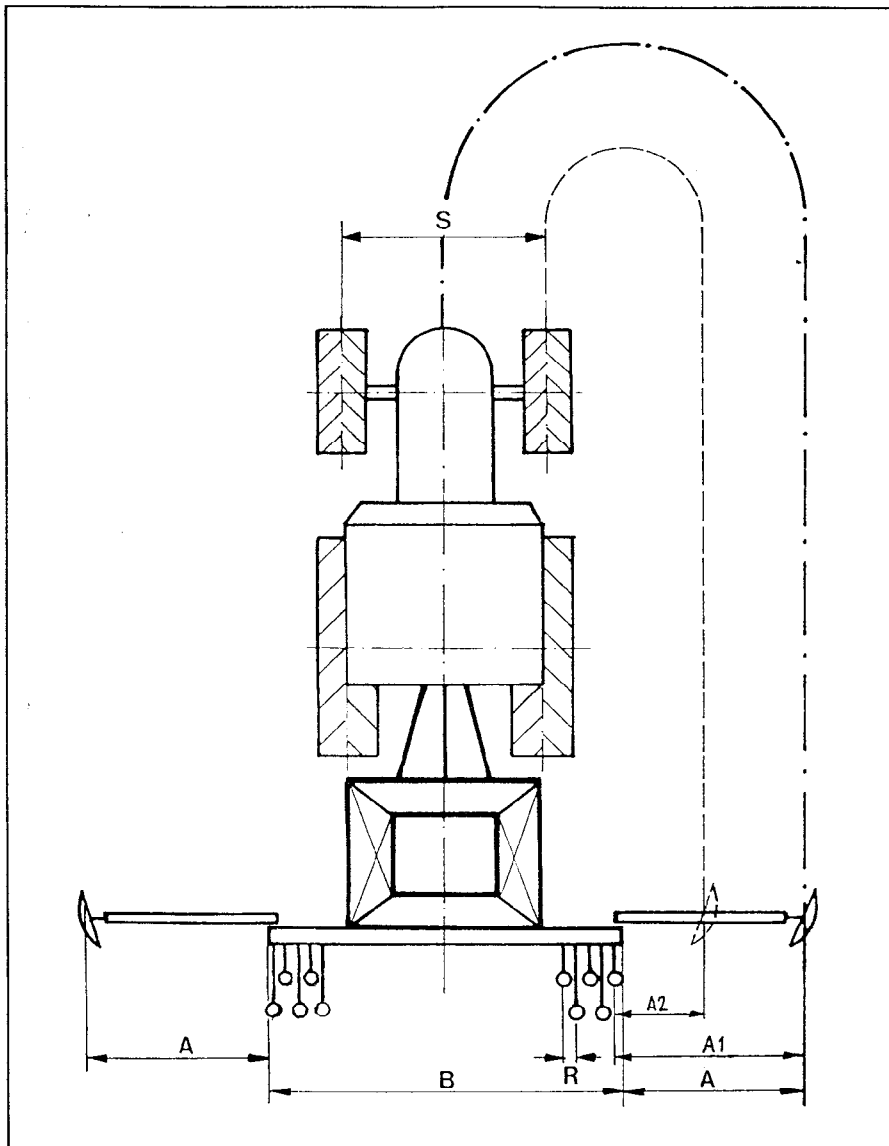


Fig. 16

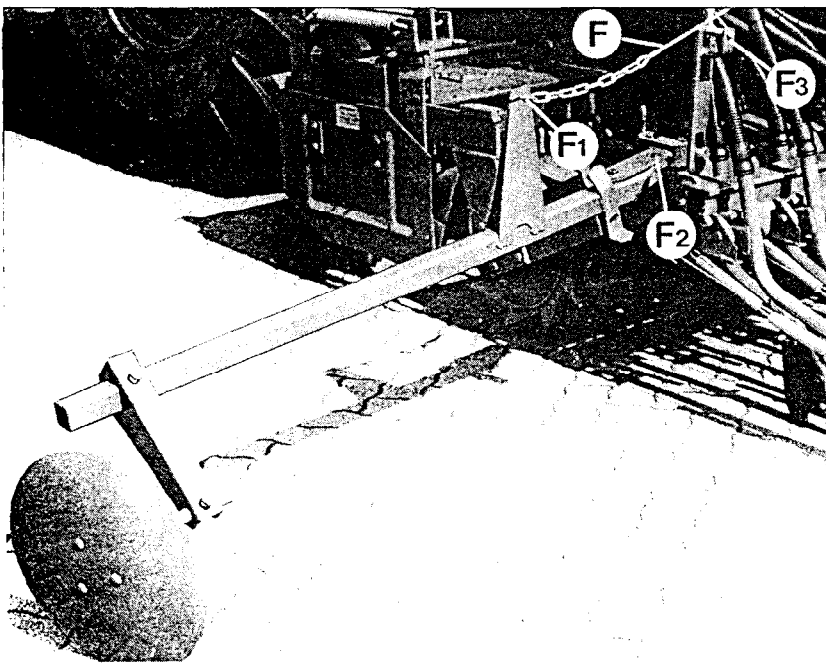


Fig. 17

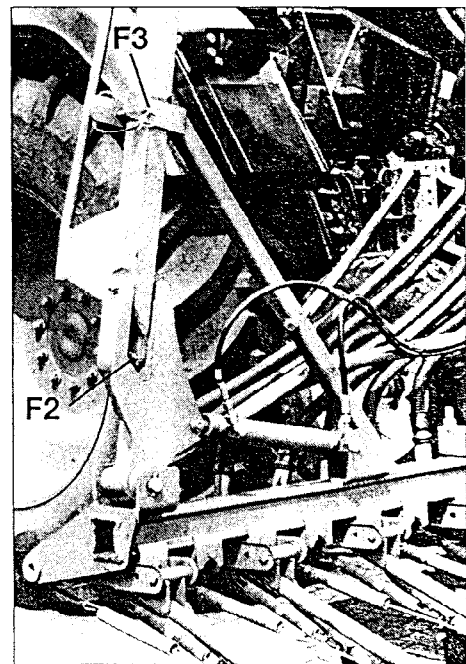


Fig. 18

### Drilling with double row spacing (Fig. 15)

If drilling with the half number of rows is required the flaps on the 'non sowing' 2-way outlets (15 Fig. E1) can be changed on every second outlet manually from the 'Open' position (15 Fig. E2) to 'Closed' position (15 Fig. E1). This unique 'butterfly' system allows the seed to be returned into the hopper.

For calibration use the half number of crank turns which are stated in chart or do a calibration test with double the required seed rate. Also the marker arms have to be set accordingly.

### Marker arm setting (Fig. 15 & 16)

The disc markers are adjustable to the tractor wheel mark or centrally to the tractor.

#### **Formula**

**Centre of tractor:** Length of marker arm setting measured from end of coulter rail  
= half of the working width = A

Measured from outer coulter  
=  $\frac{\text{Working width} + \text{row spacing}}{2}$  = A 1

**Wheel mark:** measured from outer coulter  
=  $\frac{\text{Work. width} + \text{row spacing} - \text{track width}}{2}$  = A 2

Example: 3 m working width (30 rows)      B = 300 cm  
          10 cm row spacing                      R = 10 cm  
          170 cm tractor track width            S = 170 cm

A = 150 cm; for centre marking measured from end of coulter rail.

A1 =  $\frac{B + R}{2}$        $\frac{300 + 10}{2}$       = 155 cm; measured from outer coulter for centre marking

A2 =  $\frac{B + R - S}{2}$        $\frac{300 + 10 - 170}{2}$       = 70 cm; measured from outer coulter for wheel marking

### Adjustment of draught ropes (Fig. 17)

To enable the markers to follow the contours of the ground the draught ropes should be slightly slack in work. Adjust on chains (17 Fig. F1).

More grip of the disc marker can be achieved by turning the disc axle.

As an overload protection the marker arms are fitted with

shearbolts (17 Fig. F2) M 8 x 35/ 8.8 up to 4,5 m

(18 Fig. F2) M 8 x 35/ 10.9 for 5,0 m

(18 Fig. F2) M 10 x 35/ 4.6 for 6, 0 m

#### **Warning:**

In work the hydraulic system must stay permanently in 'Lower/ Float' position.

### **Operation of markers**

The markers are operated by the hydraulic controls. To lift the marker at the headland put spool valve in 'Raise' position. The counting is transmitted to the electronic tramline control box by a sensor on the switch- over unit ( Fig. 56 & 57).

In operation keep hydraulic system always in 'Lower/ Float' position.

Up to T 450 A the hydraulic change- over unit is operated by a single acting ram.

T 500 A and T 600 A by double acting.

### **Transport** (Fig. 17 & 18)

Fold-in markers and lock securely (17 & 18 Fig. F3).

### **Coulter pressure** (Fig. 19)

The pressure on the coulters and consequently the sowing depth is centrally adjustable with the crank (19 Fig. G) and individually on each coulters (19 Fig. G1).

### **Optional hydraulic coulters pressure** (Fig. 20)

It is operated from a second single acting control.

Under varying soil conditions it can be of advantage.

The hydraulic adjustment (20 Fig. G2) can be limited by pin positioning (20 Fig. G3) between normal and maximum pressure.

### **Optional hydraulic seedrate control** (Fig. 22)

The hydraulic seedrate control works in conjunction with the hydraulic coulters pressure adjustment. To operate change over the diverter (Fig. 22).

### **Adjustment of 'maximum' seedrate** (Fig. 21)

Calibrate the normal seedrate as described before but fix the stop (21 Fig. G4) underneath the adjustment lever with the hydraulic ram in unextended position.

For the adjustment of the 'Maximum' seedrate extend the hydraulic ram fully and choose increase of seedrate by means of shifting the fix point of the ram (21 Fig. G5) upwards and tighten again.

It will be necessary to calibrate again.

### **Exchange of coulters** (Fig. 23, 24 & 27)

Without the use of tools 3 different types of coulters are interchangeable:

- Universal coulters (Fig. 23)
- Bandseeding coulters (band width approx. 8.5 cm) Fig. 27
- Single disc coulters (Fig. 24)

Disconnect the spring (23 Fig. H) and remove the spring engaged pin (23 Fig. H1).

The depth of the disc coulters can be adjusted by the limiter (24 Fig. H2). Adjust scraper (24 Fig. H3) so that turning of the disc is not hampered.

There are left-hand disc coulters for the front row (24 Fig. L) and right-hand coulters for the rear row (24 Fig. R).

All coulters feature a special hinge like joint in connection with an anti-blocking shutter.

This prevents seed pipe bending and blocking of coulters every time the drill is lowered to the ground.

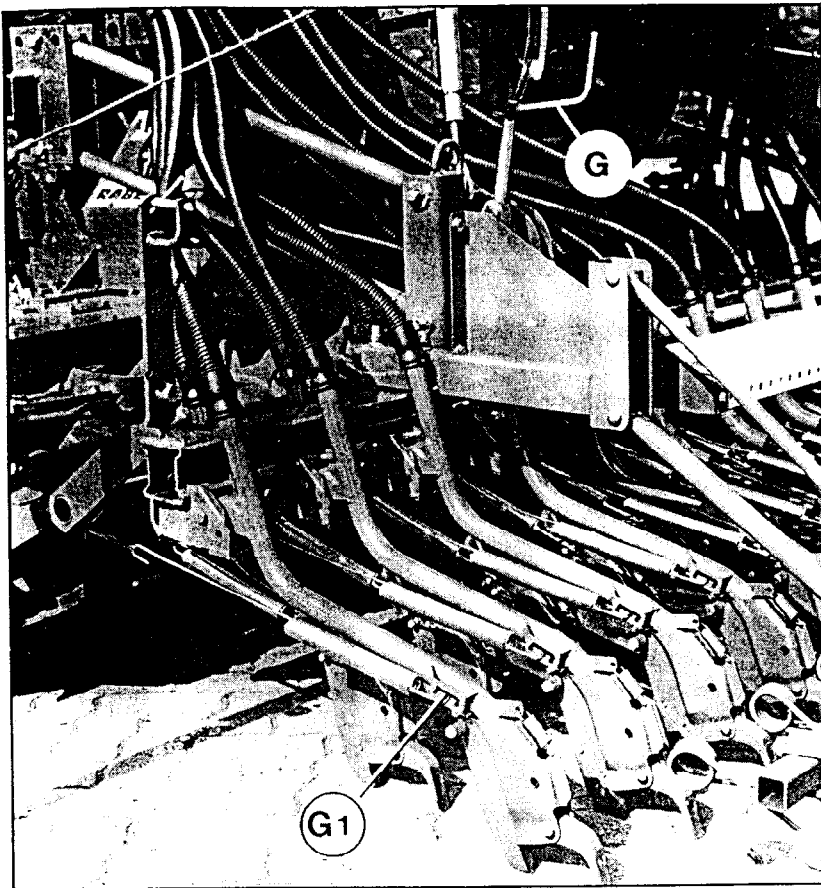


Fig. 19

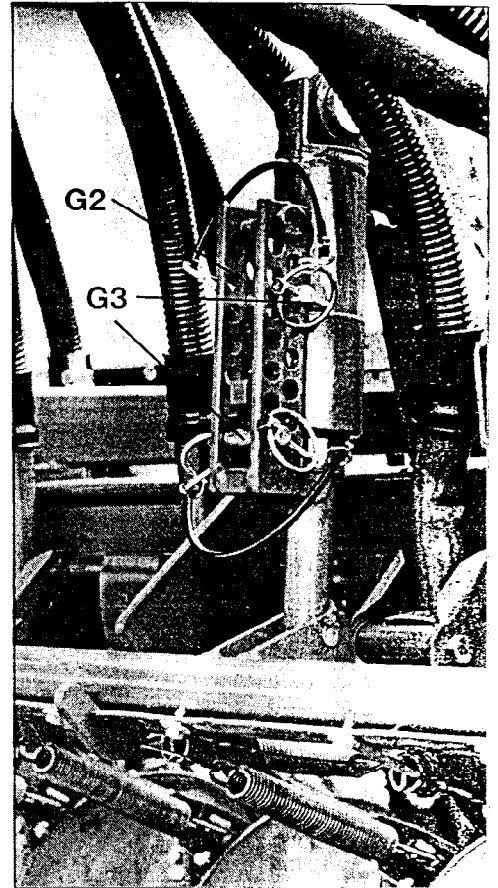


Fig. 20

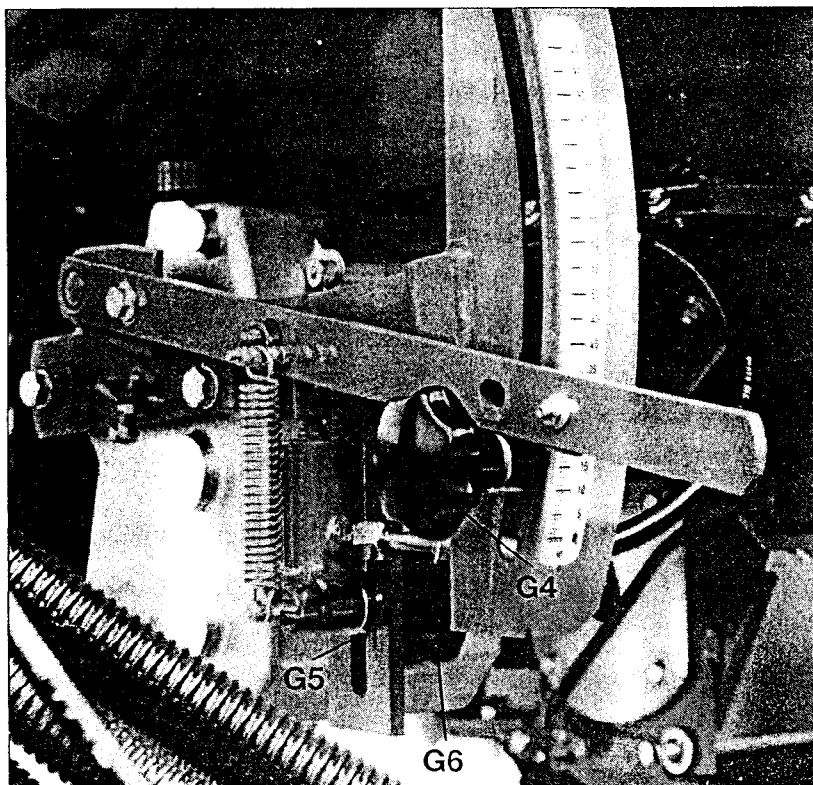


Fig. 21

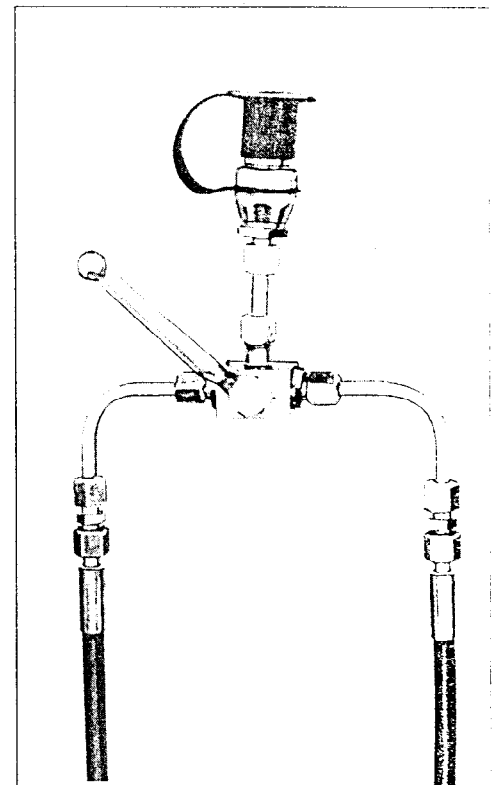


Fig. 22

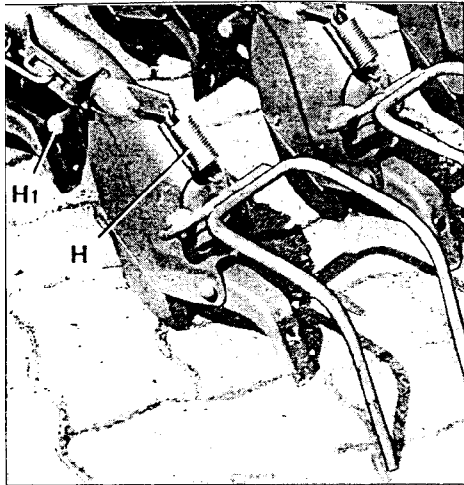


Fig. 23

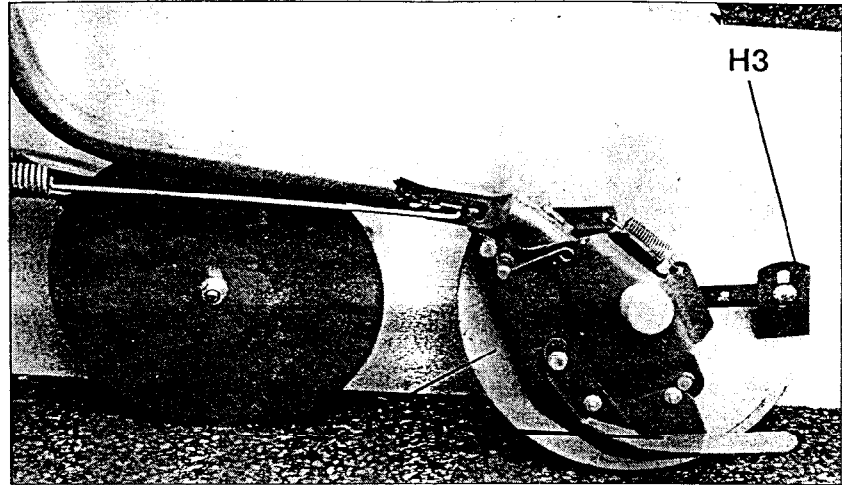


Fig. 24

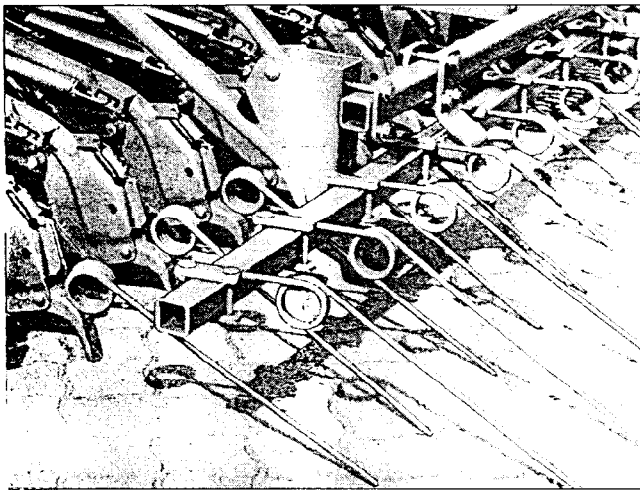


Fig. 25

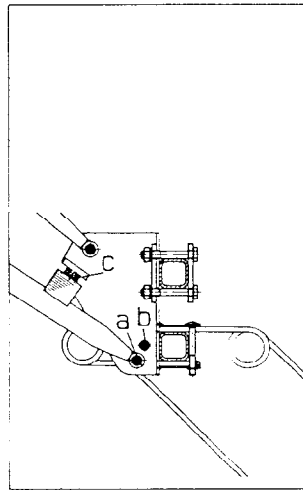


Fig. 26

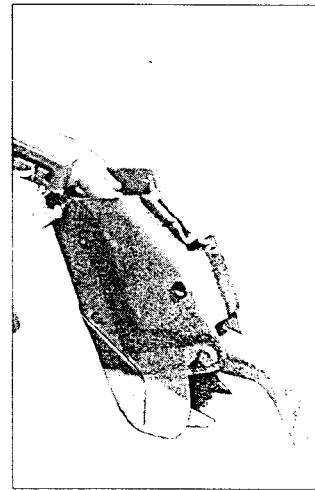


Fig. 27

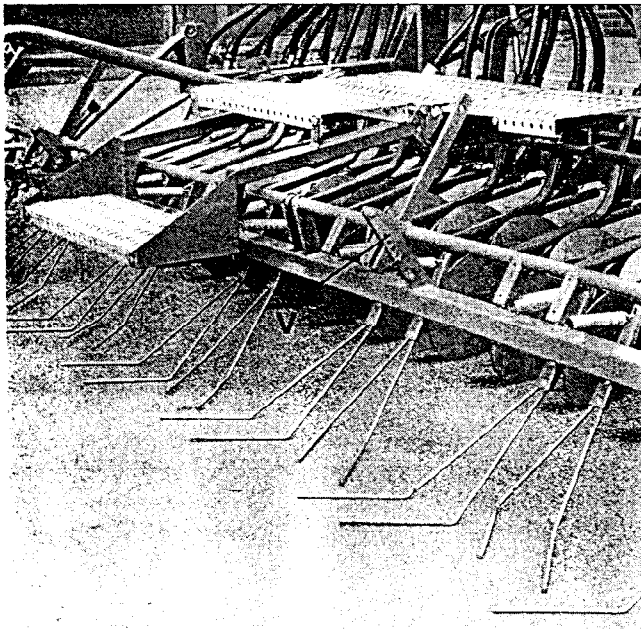


Fig. 28

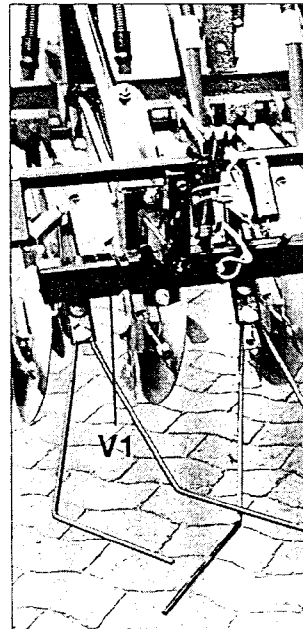


Fig. 29

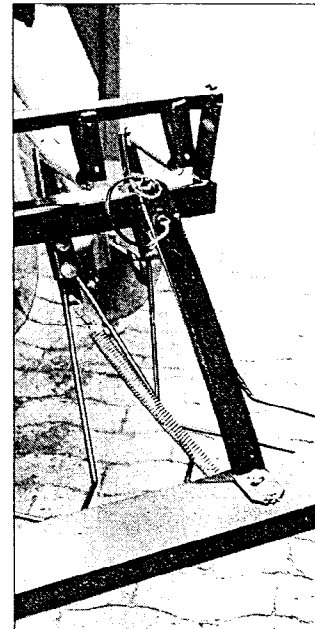


Fig. 30

### **Option of rear harrows** (Fig. 23, 25, 26, 28 & 30)

#### **Coulter harrow** (Fig.23):

Under normal soil conditions the 'Coulter harrow' (Fig. 23) is recommended to be fitted on the long tubes only.

#### **Standard rear harrow** (Fig. 25):

The divided 'Rear harrow' with rear dragging tines in two rows is recommended for more aggressive work (Fig. 25) for soils with some crop residues. Tine pressure is variable by means of repositioning the bottom rear harrow bar (26 Fig. a/b) and by removing the screw on the damper ( 26 Fig. c).

#### **Perfect harrow** (Fig. 28, 29 & 30):

Recommended for all kind of soils. Each tine segment is individually springloaded. The tine pressure is centrally adjustable. The load can be pre- selected (28 Fig. V).

The transport width on roads can be narrowed to below 300 cm if the l.h. outer harrow section is folded inwards (29 Fig. V1).

For Perfect harrows in 300 cm width is an (optional) safety cover for transport on roads available(Fig.30).

#### **Hectare meter** (Fig. 48)

As soon as the ground wheel turns the hectare meter (Fig. 48) starts counting. Full hectares and hundreds of hectares are indicated. Zero position with lever (48 Fig. R)

#### **Filling of hopper** (Fig. 31, 32 & 33)

Options:

- Top filling lid for auger or big-bags (Fig. 31)
- Top filling lid for standard bags with special bridge from trailer (Fig. 32)

By means of top filling the hopper capacity can be increased to approx. 950 liter. But the side folding lids must be closed with special holders (33 Fig. L).

#### **Filling platforms** (Fig. 31 & 34)

For calibration lift up rh. part of platform (31 Fig. N).

When equipped with bottom steps (31 Fig. N1 ) and (Fig. 34) for work they should be lifted up. Also in parking position.

Extra small platform recommended for Big- bag filling or by auger (31 Fig. N2).

#### **Trailer bridge** ( Fig.32 & 35)

Can be fixed to Turbodrill at hooks (35 Fig. a/b) for filling of hopper. Remove after and leave on trailer.

#### **Mounted auger** (Fig. 36 & 37)

To operate oil motor use double acting oil supply with pressure line to flow divider (36 Fig. P). The supply of seed can be regulated by opening the flow divider manually.

With the crank (36 Fig. P1) the auger can be shifted from transport position into work.

There are rubber locks for the lid (36 Fig P3) and a rest for the crank (36 Fig. P2).

For transport to narrow transport width below 300 cm the auger can be turned inwards (Fig. 37).

Do not allow auger to run empty and observe turning direction indicated by arrow.

**Warning: Disconnect hydraulic hoses when working on auger!**

### **Electronic tramline control**

Tramlines are unsown rows exactly spaced apart in the crop and is a proven system for all following operations like spraying and fertilizer distribution.

The electronic monitor should be fixed in the drivers view inside the cabin providing a visual indication of the tramline sequence (rhythm) and controls opening and closing of certain rows automatically.

The versatile switching rhythm provides the adaption of the working width of the seeddrill to the working width of sprayers and fertilizer spreader.

The width of the tramline track must be in accordance with the track width of the tractor used for spraying or fertilizing. Per wheel track up to 3 rows can be shut-off with solenoids fitted to the distributor head.

Unlike other systems the seed entering the seed delivery tubes is returning into the hopper. The seed delivery tubes to be shut must be changed over on the seed pipes according to the required track width of the spraying/fertilizing tractor.

The application of symmetrical tramlines can be chosen in a 2 - 12 times rhythm. One sided tramlines (not to be recommended) only can be established in a 4 - 6 or 8 rhythm. Refer to tramline chart on following page.

### **Electronic tramline monitor** (Fig. 38)

Works with 12 Volts from a 7 terminal trailer plug on the tractor. The headlights have to be switched on in dimmed position.

The switch position always stays activated (memory) even when the tractor is switched off. Also overnight to start next morning with the same switch position.

At the bottom of the monitor an exchangeable fuse (5 Amp) is provided (38 Fig. E7). Do not connect monitor already with TURBODRILL when programming the monitor.

### **To select tramline rhythm** (Fig. 38)

#### **Do not connect monitor already with Turbodrill!**

Check before start that the required tramline rhythm is set on the monitor. Remove plug (38 Fig. E4), press internal bush button and hold it. Every press with the other external button +1 (38 Fig. E5) steps up one sequence and the number will light up at the indicator (38 Fig. E6).

After selecting the rhythm put plug back and now set with external button +1 (38 Fig. E5) the sequence; which will be shown on the display (38 Fig. E6), for the 1st run from the field end. The figure to select is also stated in the chart in the next column after the tramline rhythm.

**Test:** Run through complete sequence of rhythm by pressing external button (38 Fig. E5) until the selected rhythm is flashing. Then adjust to figure 1 and connect cable from monitor to Turbodrill with the cable fastened on third loop of hook provided (refer to Fig. 5).

Before programming the monitor make sure that the track marker is ready for marking on the correct side (cultivated side).

### **Example:**

Tramline rhythm of 4 has been chosen according to width of seeddrill and working width of spraying/fertilizing tractor. By means of pressing both buttons (in and external) on monitor the rhythm 4 has been stored electronically and the required 2 setting for the 1st

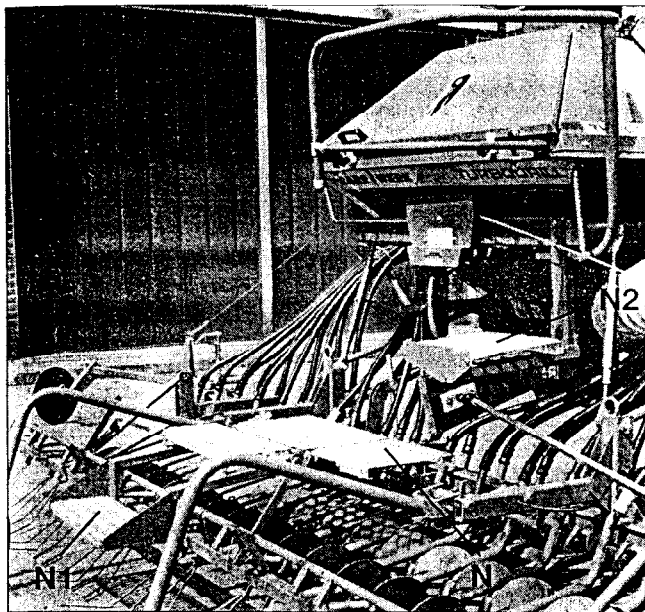


Fig. 31

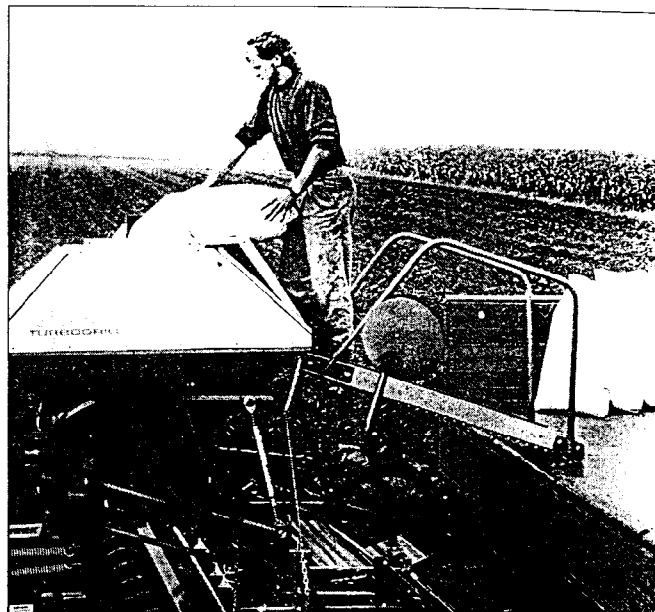


Fig. 32



Fig. 33

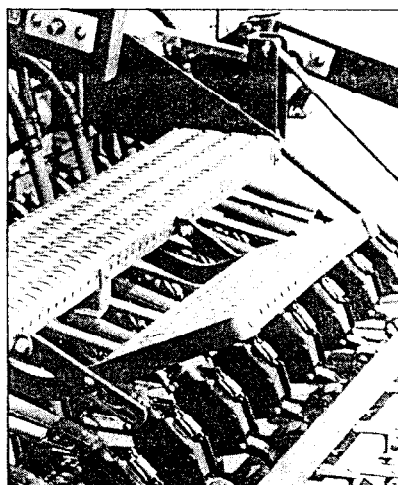


Fig. 34

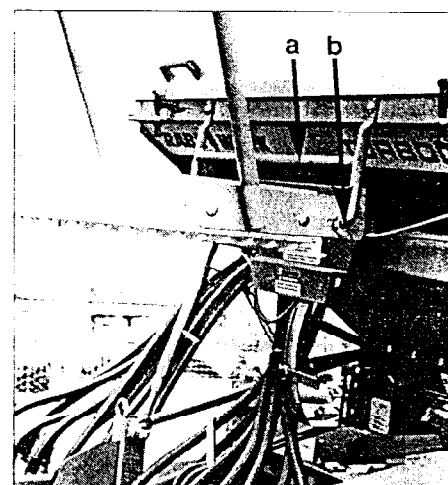


Fig. 35

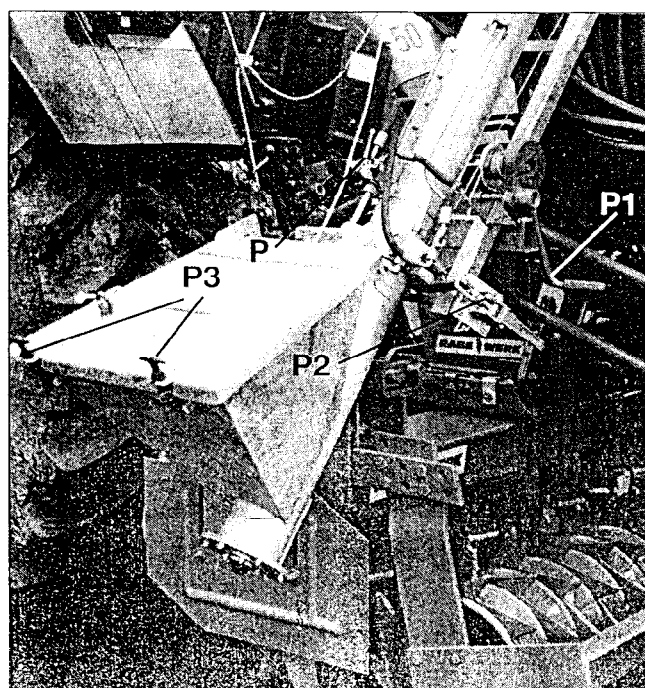


Fig. 36

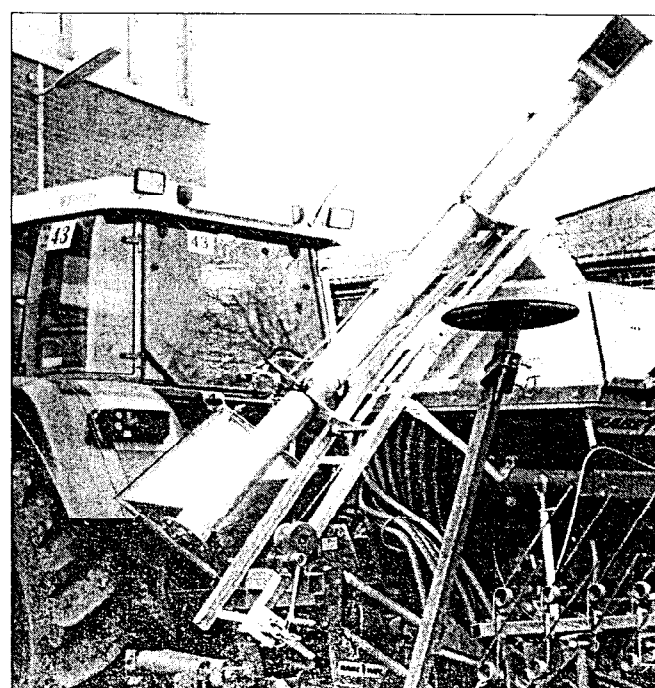


Fig. 37

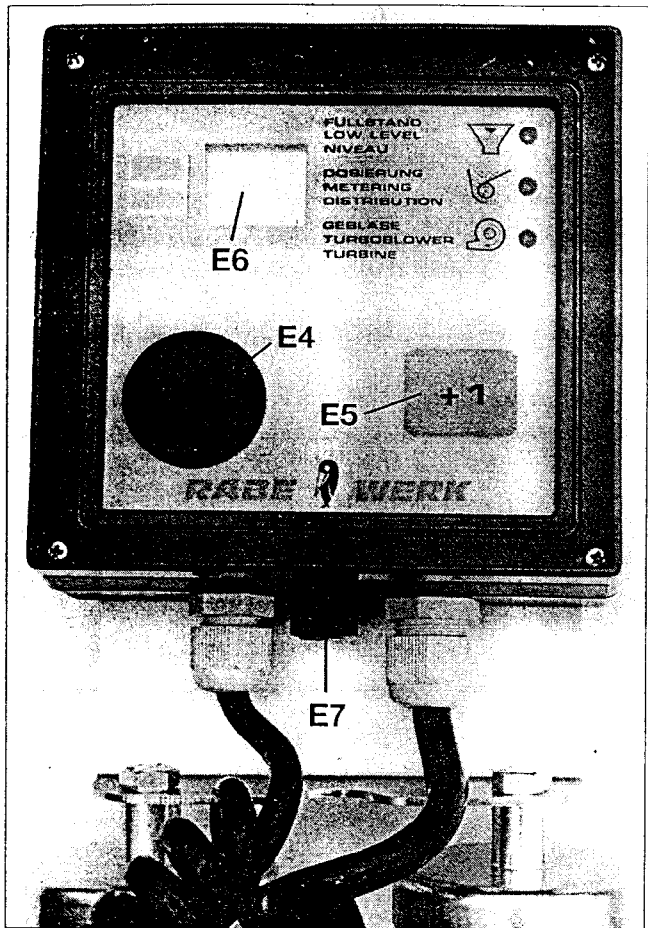


Fig. 38

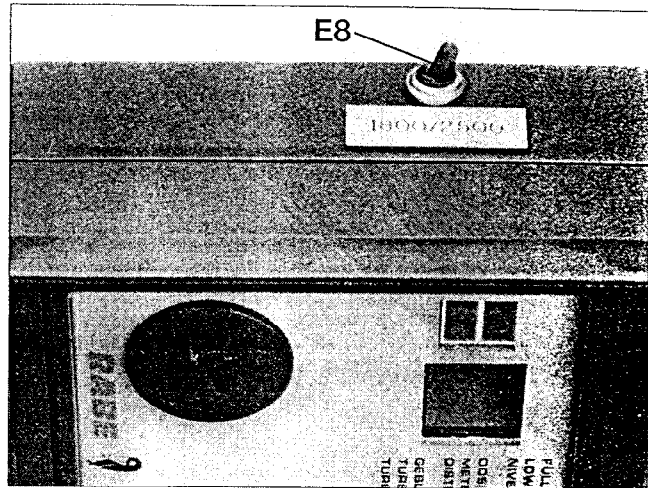


Fig. 39

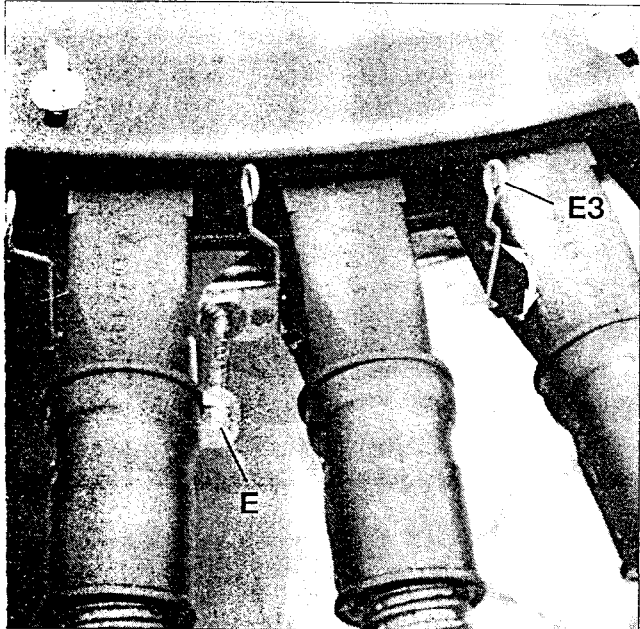


Fig. 40

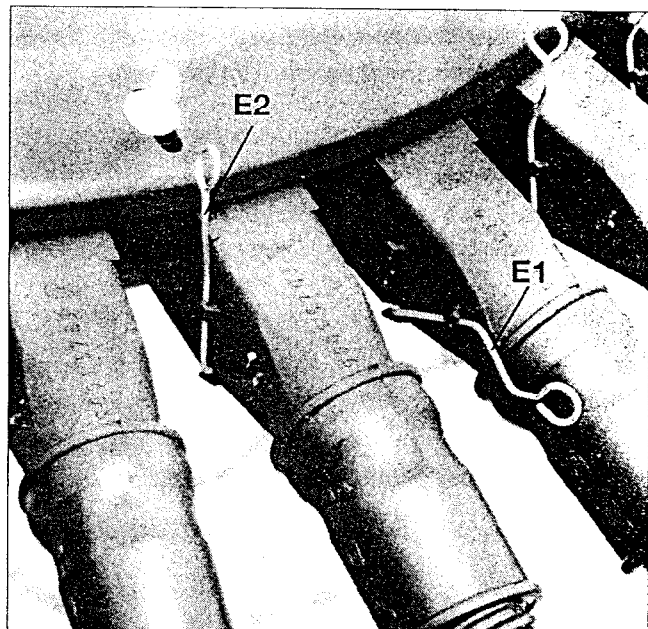


Fig. 41

run (external +1 button only) is set, the 1st run has to be done with half of the seed tube outlets closed manually on the distributor head (refer to 41 Fig. E1).

Do not close the tramline outlets.

In case the fertilizer spreader is equipped with left or right hand shut-off control it can be started with full width and tramlines on the start of the field.

If onesided tramlining is required (not recommended because difficulties in maintaining exactly spaced tramlines) the rhythm must be set according to chart on either of the three 'S' variations. The digits on the indicator will show a '5' for the 'S'.

With each successive change of the track markers at the headland the indicated digit on the monitor steps up automatically. The sensor is situated on the hydraulic ram of the track marker mechanism (56 Fig. T1).

When the tramlines are applied (shut-off rows) the indicator is flashing (38 Fig. E6) and the seed from the tramlines returns back into the hopper.

### **Two-way seed tube outlets** (Fig. 40 & 41)

The flap levers (40 Fig. E3) on the outlets for tramlining are springloaded and connected to the solenoid switch. They must be free to move between the two stops. They are connected on the solenoid with an adjustable screw (M 5 x 60). Adjust length of screw (40 Fig. E) so that the flap is closing the outlet completely when the solenoid switch is on tramlining.

The flap levers of the other outlets must be kept in the engaged position (41 Fig. E2) with the outlets open.

### **Pre-emergence tramline markers** (Fig. 42 & 43)

For pre-emergence spraying the Turbodrill can be equipped with an additional set of disc-markers at the rear to mark the tramlines during sowing. The change-over is also auto-matically and the solenoid valve is fitted on the drills frontside.

Adjust the markers according to the width of the tramlines.

For transport lift the markers out of work and lock (Fig. 43).

### **Guide lines for operation**

- Allow top link to rise towards the seeddrill and adjust length so that the P.T.O.-shaft is in horizontal position.
- Fix tractor lower link arms sideways
- P.T.O.: 1000 rpm
- Hydraulic system on tractor in 'Float position'.
- Before lowering the drill in the field excellerate engine to apprx. 3/4 rpm and maintain engine revs to allow constant revs on blower of
  - 3.000 rpm for T 300 A
  - 3.500 rpm for T 400 A and larger
- Bottom edge of coultertrail apprx. 38 - 40 cm distance to ground.
- Check in short intervals that no coulters are blocked. Stop drilling and lift machine to check if seed is been discharged out of all coulters. A certain amount of seed must be behind each individual coulters.

- Adjust ground wheel with sufficient pressure.
- Lift bottom step of loading platform out of work.
- Check correct position of metering wheel, bottom flap and air flow valve. In case of damaged seed re-adjust bottom flap one notch up as stated in calibration chart.
- Check functions of markers.
- Check tramline monitor for correct settings and if 2-way seed tube outlets are proper opened and closed by the solenoids.
- Observe low level indicator on hopper during work.
- When loading take care that no foreign objects are entering the hopper.
- Check correct tension of V-belts from time to time.
- In extremely dusty conditions make sure that hopper lids are closed and use suitable tape for sealing front of hopper lid.

#### **Emptying and storing** (Fig. 51)

Place a container or bag under the discharge funnel and open emptying shutter (51 Fig. D9). After emptying turn the metering wheels once (51 Fig. D3) and let the fan run.

Leave calibration lever in 'Calibration' Position and bottom flap in no. 6 position open. Assure that the last of the seed is completely discharged not to attract rodents to enter internal parts.

#### **Transport** (Fig. 50 & 52)

Lift set of markers in upright position and lock for safety. After this the groundwheel can be lifted up out of work. In case the pre-emergence markers are fitted lift also up and lock. Close both lids on hopper.

The rear harrows can be lifted out of work by disconnecting rods (52 Fig. M) and secured with pin again in lifted position.

#### **Parking** (Fig. 53)

Store only with empty hopper and on parking stands (53 Fig. A). Shift stands in up against stops and adjust length of stands so that machine leans slightly forward. Remove driving belts, disconnect hydraulic hoses and electrical connection.

Disengage the tensioning device (53 Fig. Ö) and lower the rotary harrow to separate the seeddrill.

#### **Solo 3-point hitch** (Fig. 49)

Mount drill on Solo 3-point hitch as described in this manual under 'Mounting Turbodrill' and fit drive belts and guard. To cut required length of P.T.O.-shaft and for maintenance also of slip clutch observe separate manual of P.T.O.-shaft manufacturer.

Adjust track eradicators in the field to optimal length.

Tyre pressure:	6.00 -16	-	1,5 bar
	10.0/75-15	-	0,8 bar

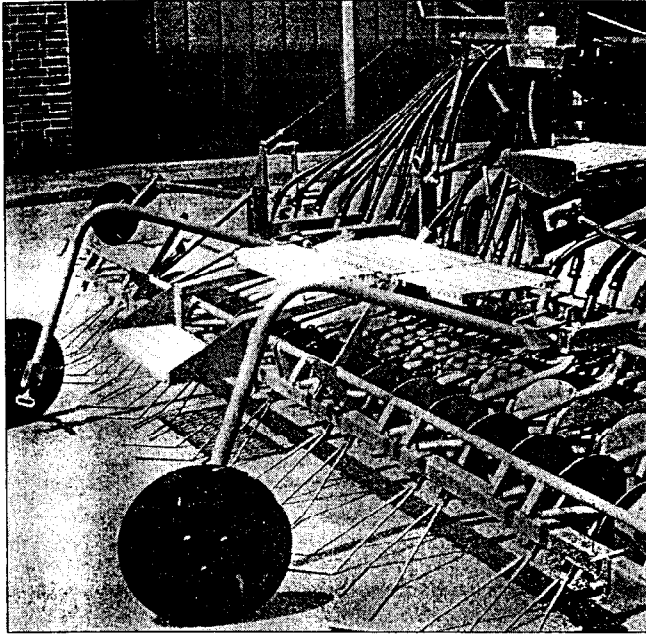


Fig. 42

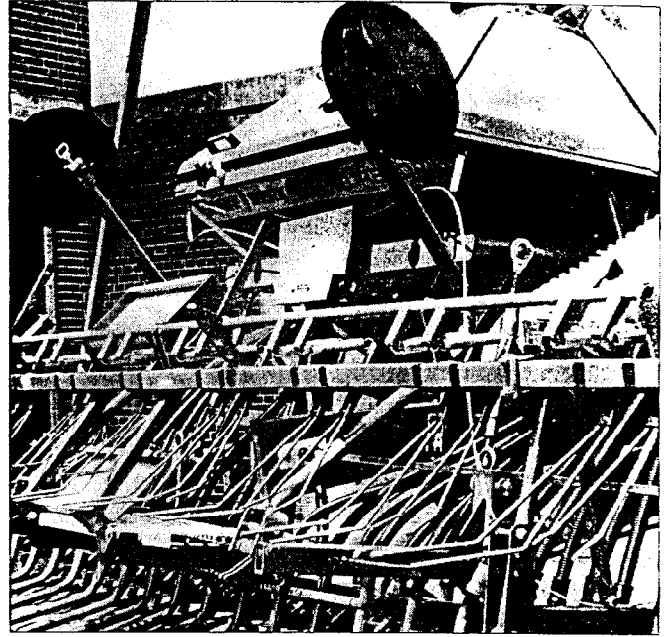


Fig. 43

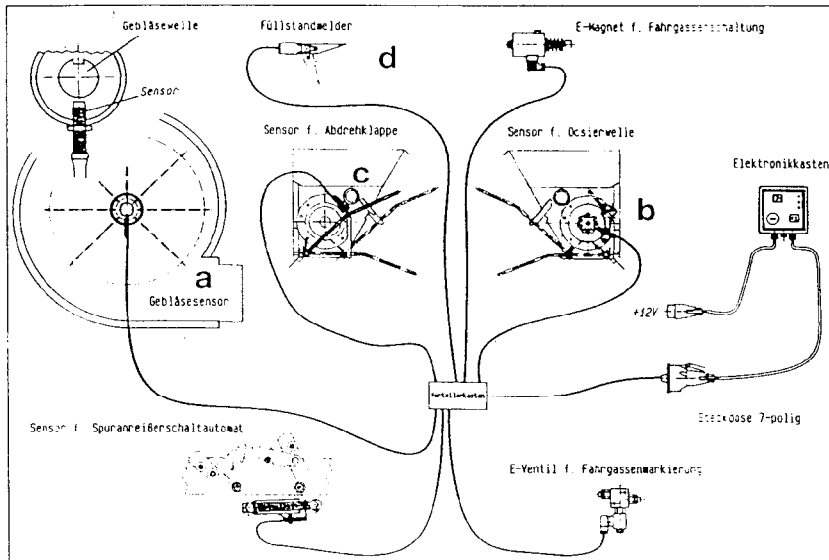


Fig. 44

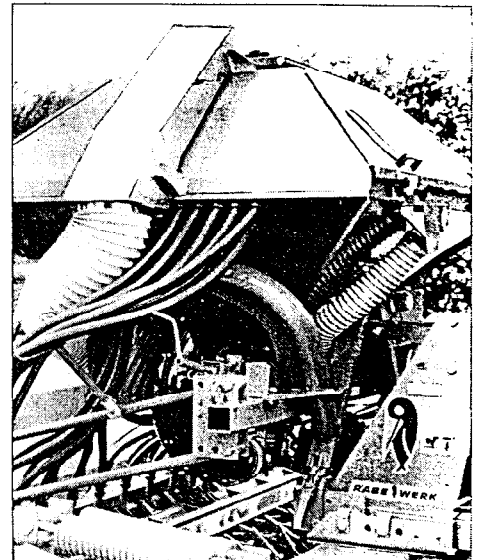


Fig. 45

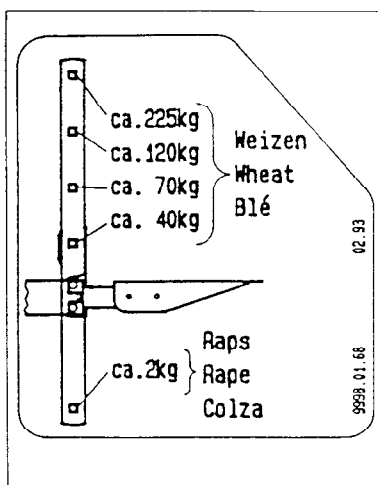


Fig. 46

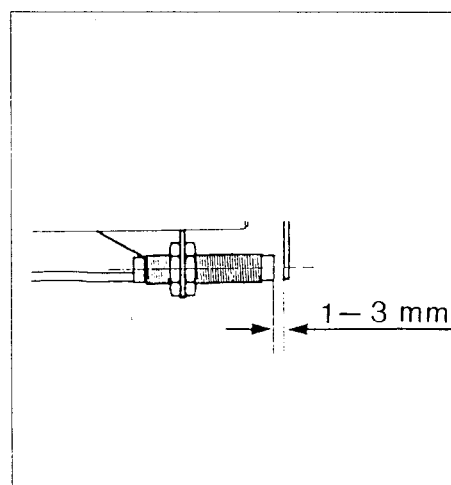


Fig. 47

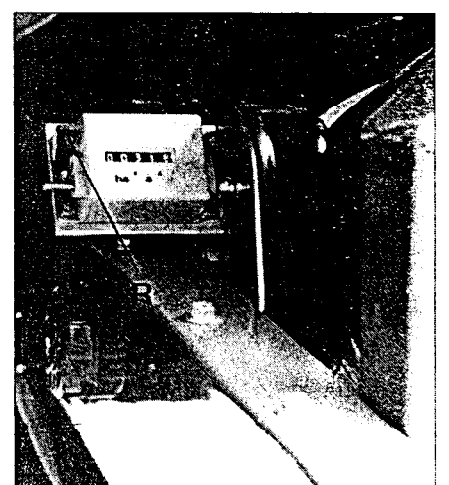


Fig. 48

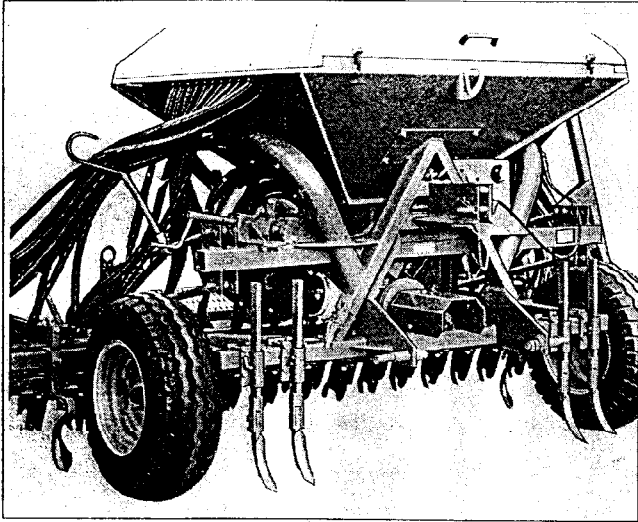


Fig. 49

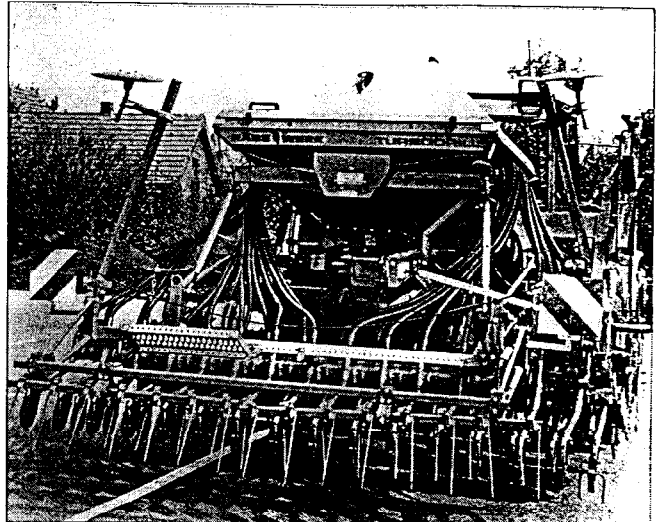


Fig. 50

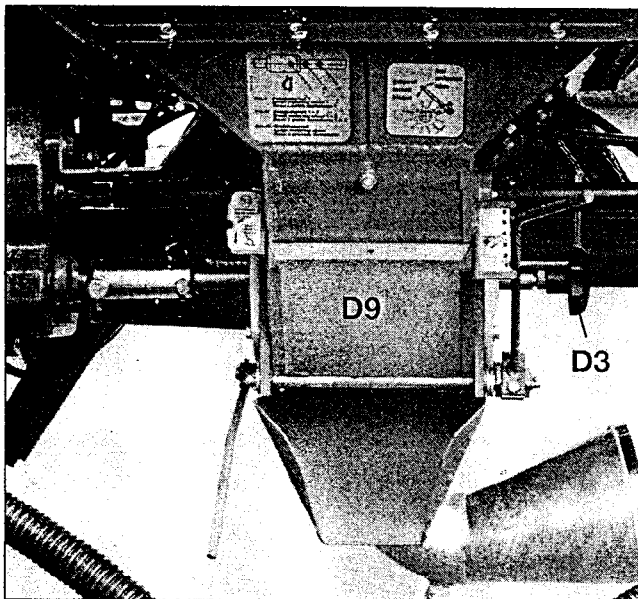


Fig. 51

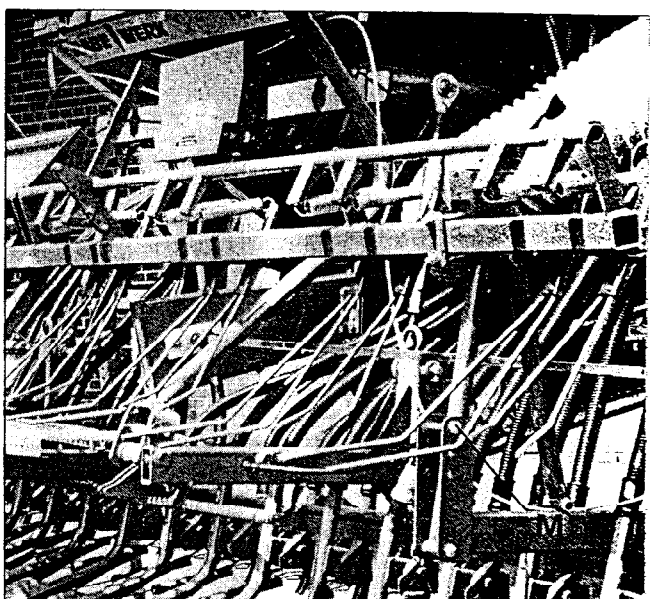


Fig. 52

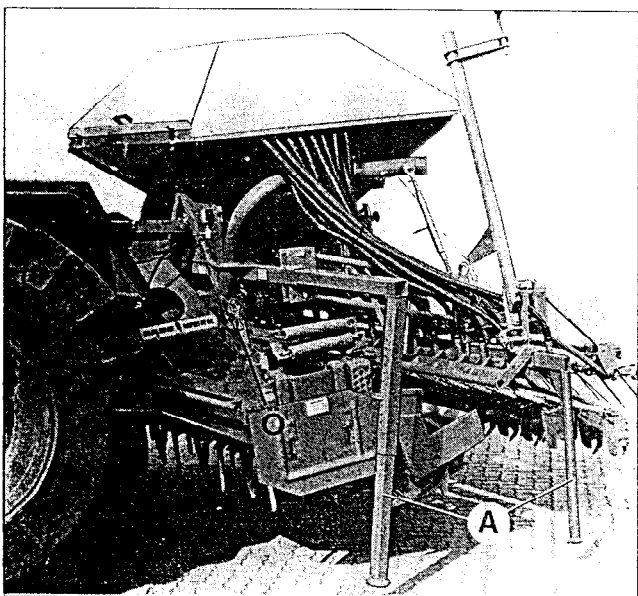


Fig. 53

### **Chain drive of metering wheel** (Fig. 54)

Once a season retighten chain drives (54 Fig. K + K1) by slackening the bearings and tensioning by hand again.

In case of welding on seeddrill or charging batteries of tractor make sure that the tramline monitor has been disconnected.

### **Basic adjustment of marker switch-over unit** (Fig. 56 & 57)

Swing the markers in working position. Then operate the hydraulic ram until fully extended. Both markers are then in raised position.

The hex. nuts (56 Fig. K2) on the plunger should be aligned with 24 mm spanner to allow one pawl to engage smoothly when the other pawl is disengaged.

### **Basic adjustment of sensors** (Fig. 47 & 57)

The inductive sensors are adjusted with gap of 1 - 3 mm (Fig. 57). There is a built-in function control by means of a light diode, which shows if the sensor is working.

To set sensor (56 & 57 Fig. T1) for the marker switch-over unit close hydraulic ram completely.

### **Over-run clutch**

Must be fitted when PTO- shaft for rotary harrow is equipped with auto cut-out clutch. Also must be fitted when tractor is equipped with hydro- electric engaged PTO. Otherwise jerky interruptions of the drive will result in high V- belt wear and damages. Also the fan can be damaged.

The over-run clutch (incl. pulley) will be fitted on the fan driving shaft. Also retro-fit possible.

### **Lifting TURBODRILL by crane** (Fig. 54)

**Warning:** Only with empty hopper and never with rotary harrow or any other implement attached! Use professional straps for lifting.

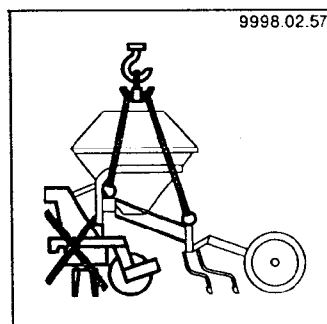
There are 4 lifting hooks provided:  
one on each side

- of the front cross member (54 Fig. K4)
- of coulter rail main brackets (54 Fig. K5)

To avoid damage on the hopper make sure that the hopper will not be squeezed.

### **Oilbath gearbox** ( Fig. 55)

Check once a season the oil level in the gearbox ( K6 Fig. 55) with dipstick. To check level do not screw in dipstick. If necessary refill with hydraulic oil HLP 32. The correct capacity is 2.5 liter.



## **Maintenance**

Carry out regular checks to ensure that the seed coulters are not blocked and that seed flow is unhindered.

**RABEWERK accept no liability for consequential damages of any kind.**

- After the first working hour, check and re-tighten all hardware.
- Lubricate approx. every 50 working hours the bearings on the disc markers.
- Check oil level in gearbox. An inspection glass is provided. The oil is a permanent filling. Oil change is not necessary.
- Check belt tension and alignment.
- Slacken V-belts if the drill combination is stored for a longer period.

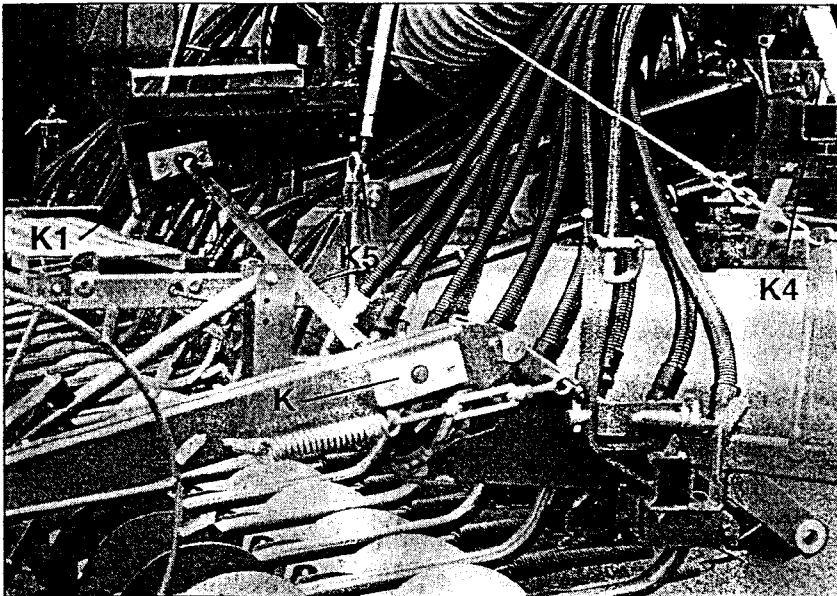


Fig. 54

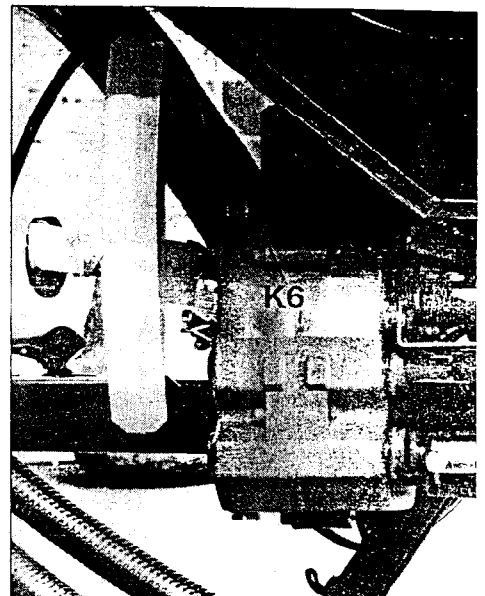


Fig. 55

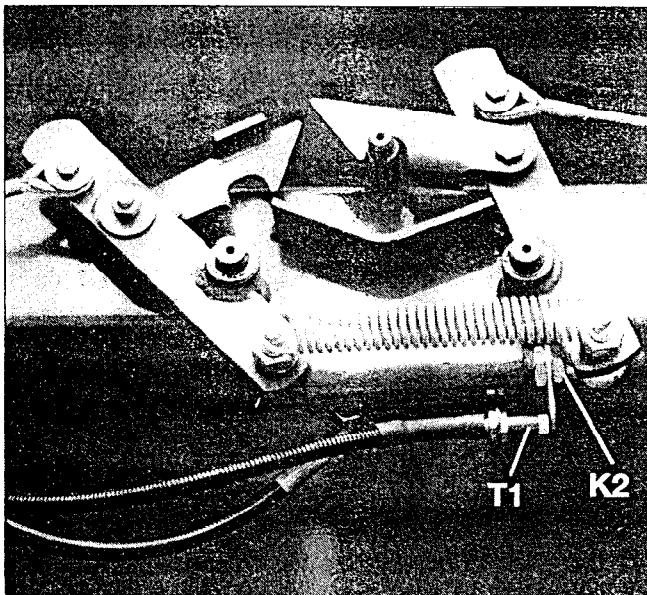


Fig. 56

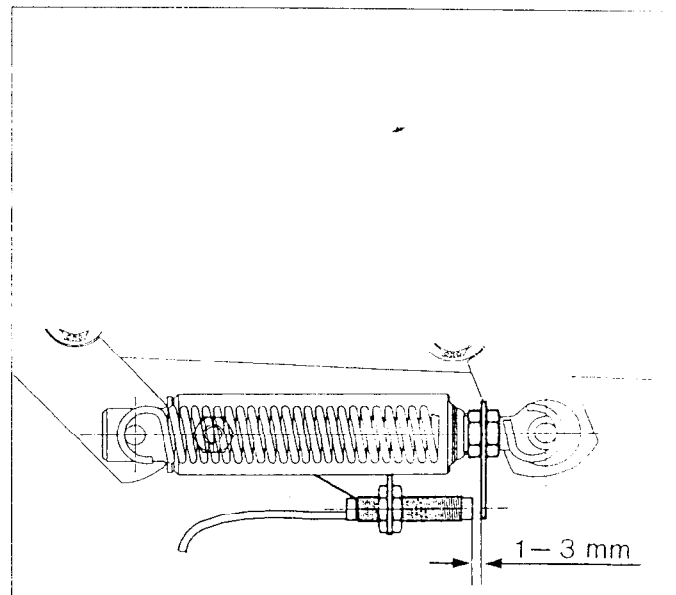


Fig. 57

### Assembly of A - frame and belt pulley (1000 rpm only)

**Important:** The A- frame must be fitted in exact upright position to the PTO - drive and the measure of 115 mm between pulley and A- frame must be observed!

Rotary harrow	MKE					PKE					HKE		
	300	301	401			3,0	4-4,5				3,0	4,0	
Lever change gearbox				3,0	4,0			3,0	4,0	4,5		3-5	6,0
Pin hole Implement: A	165		290	165	155			290			c	b	a
Pin hole * A-frame: B	B3		B1		B2			B1			-		
Top link: C	187	252	210	160	102	267	210	267		210	262	245	278
Pulleytype ++	L2		K2	L1	GK1		K2			GL1	K2		K1
V- Belt length mm	1750		1700		1750	1800	1750		1700	1650	1800	1750	1650

#### Dia. of belt pulleys:

On PTO- through shaft 254 mm

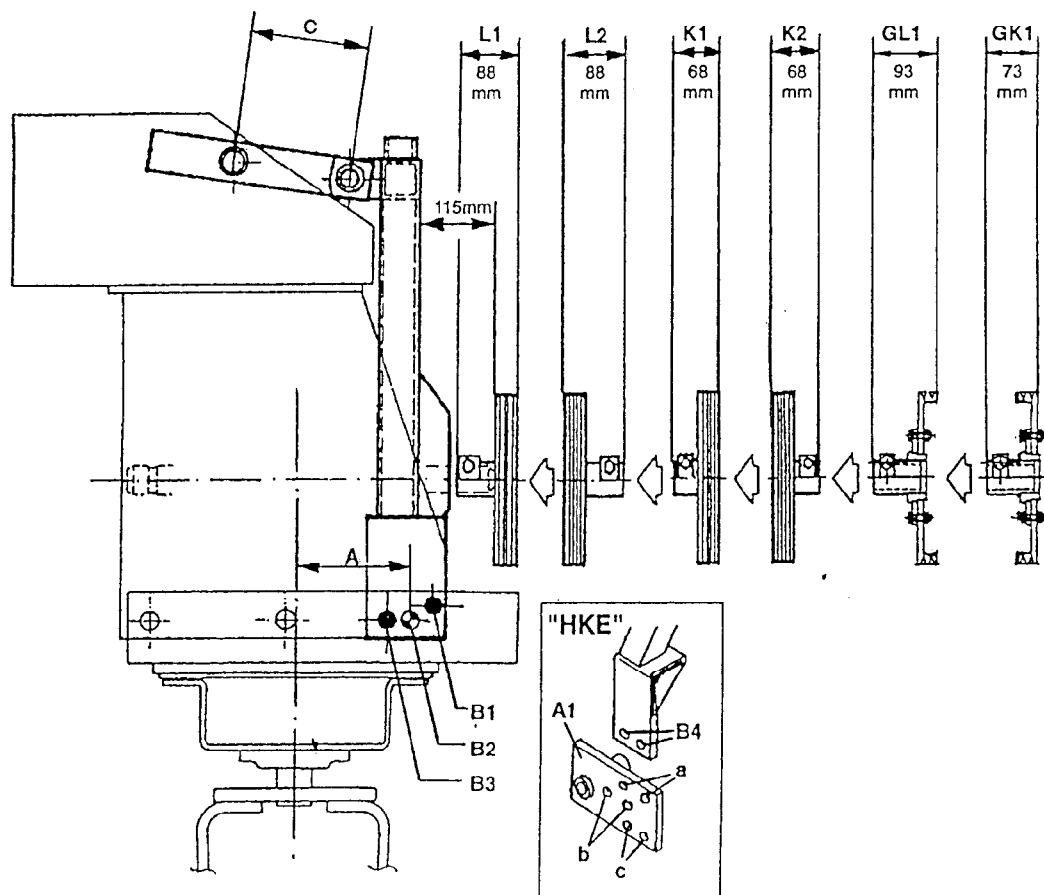
On fan for 3,0 m drill 84 mm

On fan from 4,0 m + 75 mm

\* Torque bolts with 650 Nm

HKE with 210 Nm

\*\* G- type pulleys with bolt-on hubs



Work. width Seeddrill	Spraying Fertilizing	Rhythm	Examples for tramlines
--------------------------	-------------------------	--------	------------------------

### Symmetrical tramlines

3,00 m 4,00 m	9 m 12 m	3	
2,50 m 3,00 m 4,00 m 4,50 m	10 m 12 m 16 m 18 m	4	
2,50 m 3,00 m 4,00 m	12,5 m 15 m 20 m	5	
2,50 m 3,00 m 4,00 m 4,50 m	15 m 18 m 24 m 27 m	6	
3,00 m 4,00 m	21 m 28 m	7	
2,50 m 3,00 m 4,00 m	20 m 24 m 32 m	8	

### Onesided tramlines

2,50 m 3,00 m 4,00 m 4,50 m	10 m 12 m 16 m 18 m	4 S	
2,50 m 3,00 m 4,00 m 4,50 m	15 m 18 m 24 m 27 m	6 S	
2,50 m 3,00 m 4,00 m	20 m 24 m 32 m	8 S	

## Electronic alarm functions (Optional)

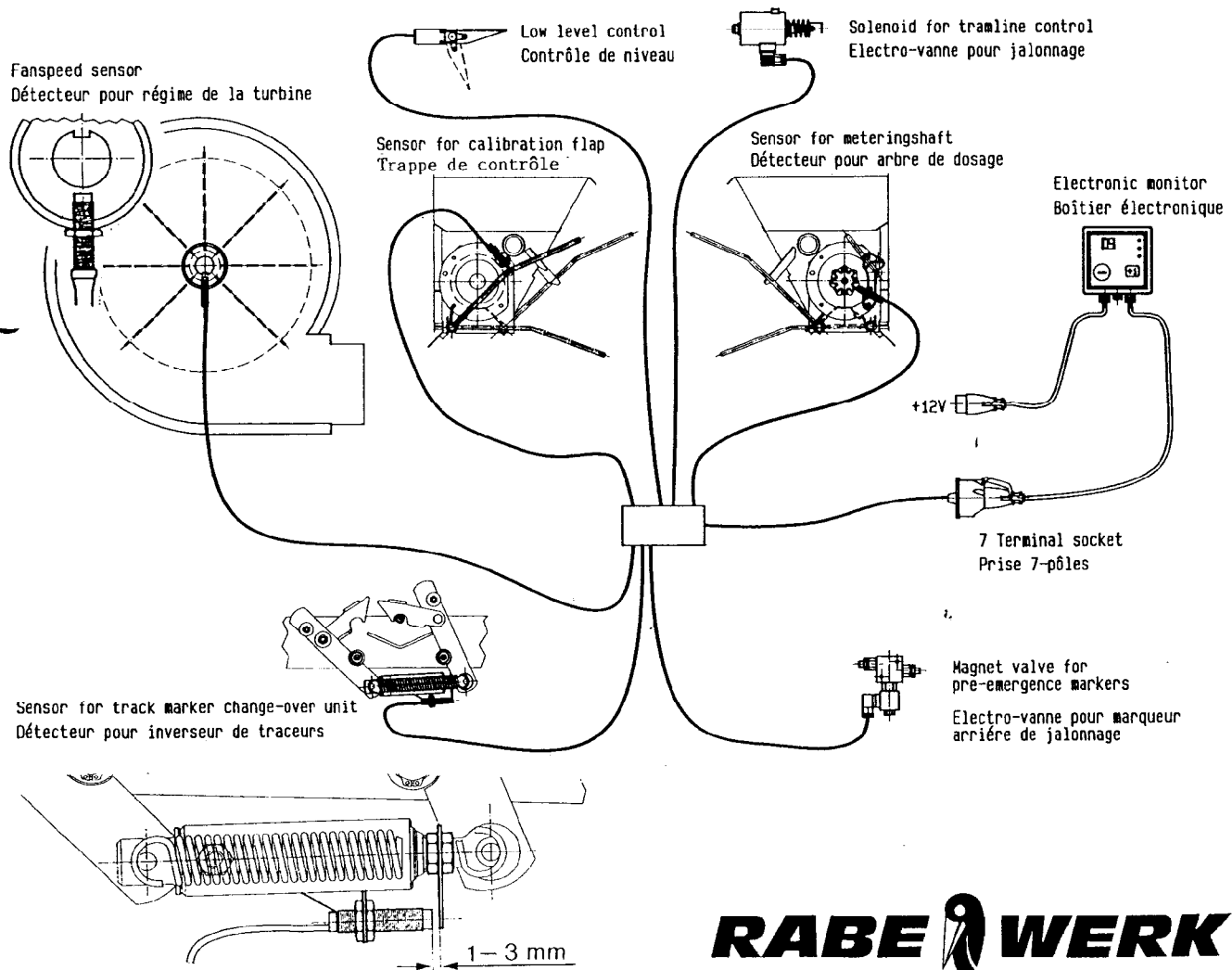
In combination with the electronic tramline control, alarm devices for the following functions are available: fan, metering, calibration flap and low level.

Disturbances during operation are indicated on the electronic monitor by light signs and acoustic signals except the low level control without acoustic warning. The fan alarm is also working when the fan revs are too low. Despite this additional alarm it is essential to take care that the fan is always operated with high enough revolutions (apprx. 1000 rpm. on the PTO.), also when starting on headlands or stops in the field. Every time the trackmarkers are operated (the hydr. change over cylinder is extended), the alarm is interrupted on the fan and metering, hence no alarm is released when turning on headlands.

The inductive sensors must be adjusted with a clearance of 1 - 3 mm. To adjust the fansensor turn the fanshaft until the key way is at the top. Then turn sensor manually against the shaft. Rewind 3.5 turns and counter lock. To check for function the built-in diode on the sensor must be a light in alarm position.

To select tramline rhythm (fig. 28 + 29, page 21)

The tramline outlets (28 Fig. E 3) can now also be closed if on the 1st run one half of the seedpipe outlets have been closed manually.

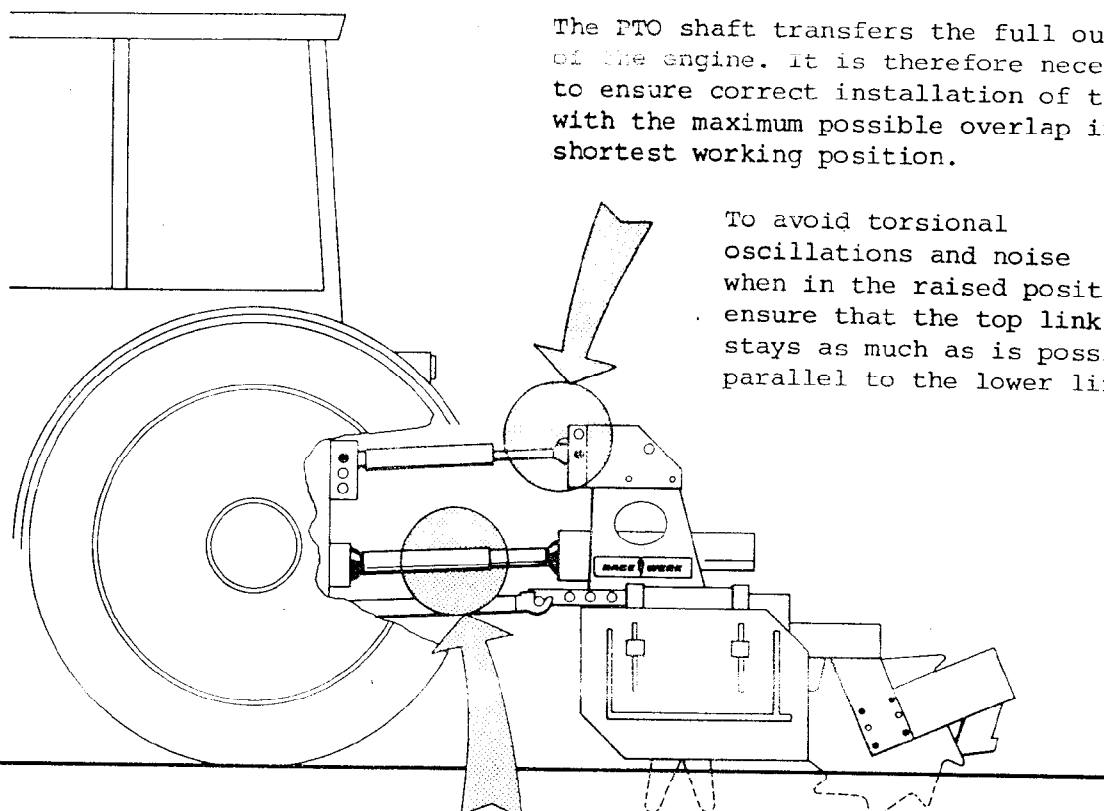


# **IMPORTANT**

## Correct use

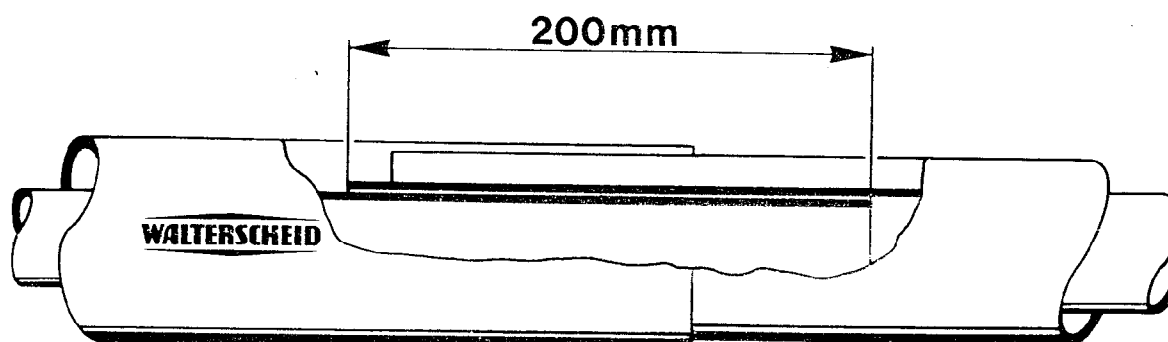
### of Walterscheid PTO drive shafts for

### Rabe Rotary Harrows and Tine or Blade rotor Machines.



The PTO shaft transfers the full output of the engine. It is therefore necessary to ensure correct installation of the shaft with the maximum possible overlap in the shortest working position.

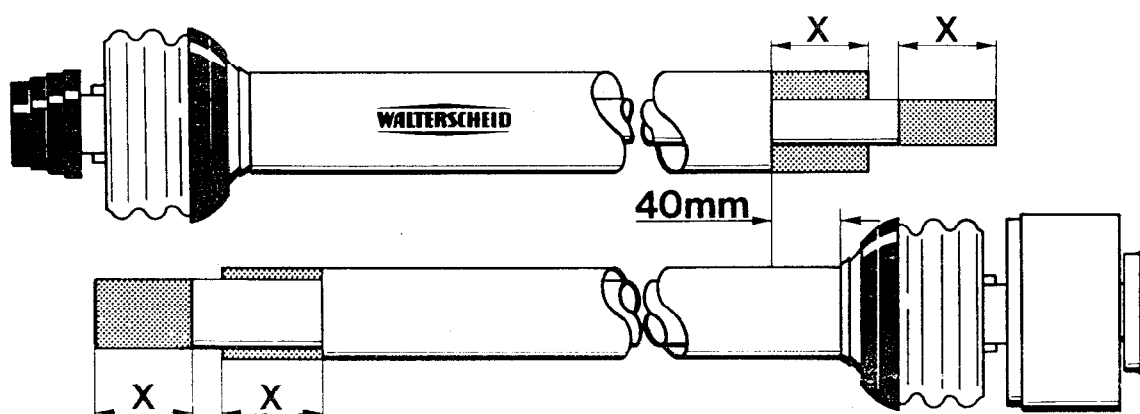
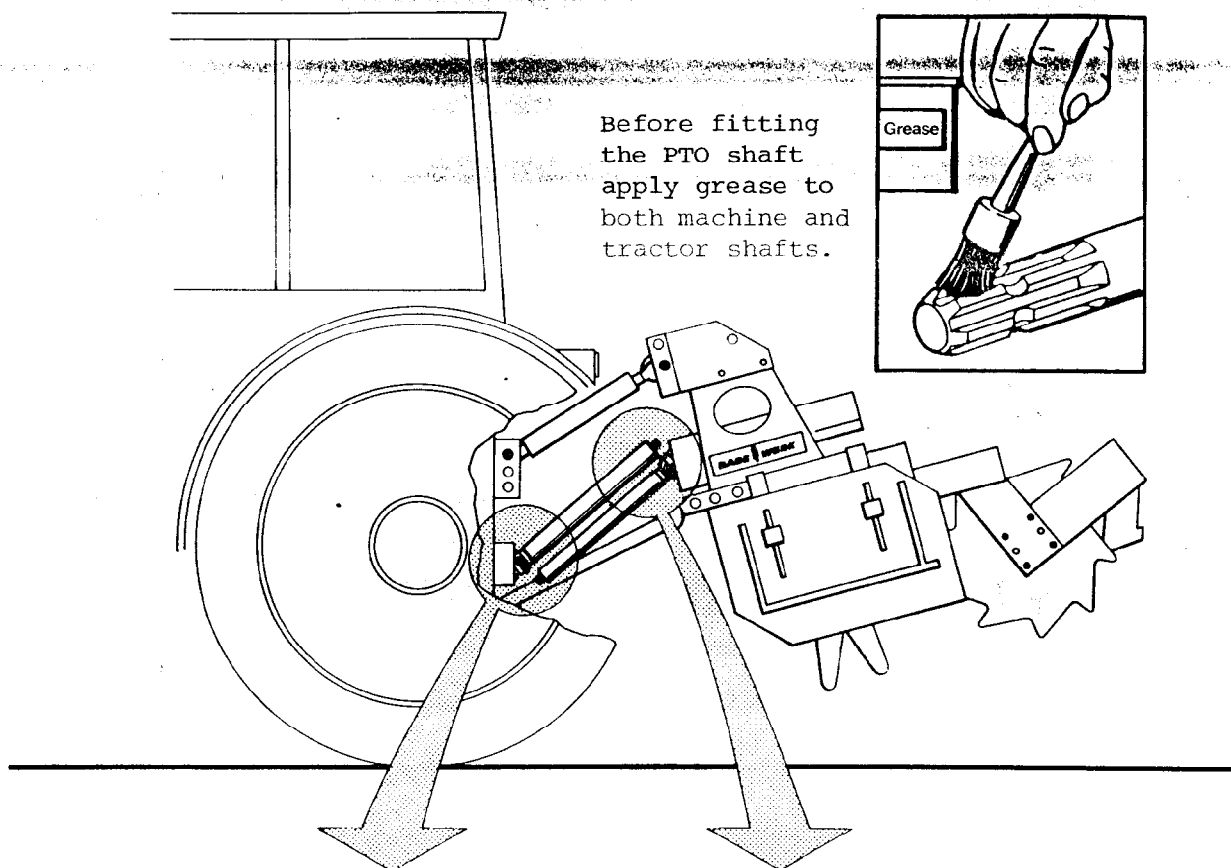
To avoid torsional oscillations and noise when in the raised position ensure that the top link stays as much as is possible parallel to the lower link arms.



When in work the minimum overlap of the shaft profiles is 200 m.m. (8ins.) If necessary adjust the crossshaft mounting arms of the harrow. If the minimum overlap is not obtainable a special hub profile PTO shaft is available.

Ensure the Q C key-type lock (machine end) has been correctly fitted, refer to separate instructions provided with the PTO shaft.

Any subsequent damage caused by incorrect installation and mounting of the harrow as well as defective maintenance nullifies the warranty!



Before use check the length of the PTO shaft and adjust if necessary.

1. Hold the half-shafts next to each other in the shortest working position and mark them.
2. Shorten both guard tubes equally (X).
3. Shorten each half of the shaft by the same length as the guard tubes (X).
4. Round off all sharp edges and burrs carefully. Grease both sliding profiles before assembly.

**Calibration chart for T 300 A (3,0 m Work. width)**

Seeds		Barley					Oats					Rye					Wheat				
Bottom flap position		1					1					1					1				
Metering wheel position		Metering wheel III					Metering wheel III					Metering wheel III					Metering wheel III				
Airflow valve position		Standard and coarse seed					Standard and coarse seed					Standard and coarse seed					Standard and coarse seed				
Row Spacing (cm)		10,0	11,5				10,0	11,5				10,0	11,5				10,0	11,5			
Metering lever position	20											77	67								
	25	98	85									98	85								
	30	115	100				93	81				119	103				127	110			
	35	134	116				110	95				140	121				149	129			
	40	153	133				127	110				161	140				171	148			
	45	172	149				144	125				182	158				193	167			
	50	191	166				160	139				202	175				215	186			
	55	210	182				177	153				223	193				236	205			
	60	229	198				194	168				244	211				256	222			
	65	248	215				211	183				265	230				280	243			
	70	267	231				229	198				286	248				302	262			
	75	287	249				247	214				307	266				325	282			
	80	308	267				266	231				330	286				351	304			
	85	330	286				286	248				355	308				378	328			
	90	353	306				306	265				380	329				405	351			
	95	377	327				327	283				407	353				432	374			
	100	402	348				348	302				435	377				459	398			

**Note:** The figures stated are in kg/ha and can only be guide lines.  
The exact amount drilled can be only ascertained by physical calibration tests.  
\* = Distributorhead with 20 outlets.

1 hectare (ha) = 2,471 acres

**Calibration chart for T 300 A (3,0 m Work. width)**

Seeds		Dressed Rape (Drill without agitator fingers)				Std. Rape				Grass seed				Clover			
Bottom flap position		2				2				1				1			
Metering wheel position		Fine seed wheel II				Fine seed wheel II				Metering wheel III				Fine seed wheel II			
Airflow valve position		Fine seed				Fine seed				Standard and coarse seed				Fine seed			
Row Spacing (cm)		10,0	11,5			10,0	11,5			10,0	11,5			10,0	11,5		
		15,0*				15,0*				15,0*				15,0*			
Metering lever position	5																
	10	2	1,7							21	18			3,8	3,3		
	15	3,2	2,8							33	29			5,3	4,6		
	20	4,3	3,7							45	39			6,7	5,8		
	25	5,4	4,7			5,2	4,5			57	49			8,0	6,9		
	30	6,5	5,6			6,3	5,5			69	60			9,2	8,0		
	35	7,6	6,6			7,4	6,4			81	70			10,4	9,0		
	40	8,6	7,5			8,5	7,4			92	80			11,6	10,1		
	45	9,7	8,4			9,6	8,3			103	89			12,8	11,1		
	50	10,7	9,3			10,6	9,2			115	100			14,1	12,2		
	55					11,8	10,2			127	110			15,4	13,3		
	60					12,9	11,2			139	120			16,7	14,5		
	65					14,1	12,2			151	131			18,0	15,6		
	70					15,4	13,3							19,4	16,8		
	75					16,8	14,6							20,8	18,0		
	80					18,3	15,9										
	85					19,9	17,2										
	90					21,6	18,7										
	95					23,4	20,3										
	100					25,1	21,8										

**Note:** The figures stated are in kg/ha and can only be guide lines.  
The exact amount drilled can be only ascertained by physical calibration tests.

\* = Distributorhead with 20 outlets.

1 hectare (ha) = 2,471 acres.

## Calibration chart for T 300 A (3,0 m Work. width)

Seeds		Peas				Beans				Phacelia				Sunflower			
Bottom flap position		4				4				1				3			
Metering wheel position		Metering wheel				Metering wheel				Fine seed wheel II				Fine seed wheel I+II			
Airflow valve position		Standard and coarse seed				Standard and coarse seed				Fine seed				Standard and coarse seed			
Row Spacing (cm)		10,0 15,0*	11,5			10,0 15,0*	11,5			10,0 15,0*	11,5			10,0 15,0*	11,5		
Metering lever position	20																
	25	100	87							4,9	4,2						
	30	121	105			118	102			5,9	5,1						
	35	142	123			138	120			6,9	6,0			4,1	3,6		
	40	163	141			160	139			7,9	6,8			5,2	4,5		
	45	184	159			182	158			8,9	7,7			6,1	5,3		
	50	205	178			204	177			9,9	8,6			7,1	6,2		
	55	226	196			224	194			11,0	9,5			8,0	6,9		
	60	247	214			244	211			12,0	10,4			8,9	7,7		
	65	268	232			264	229			13,0	11,3			9,9	8,6		
	70	289	250			284	246			14,3	12,4						
	75	311	270			305	264			15,4	13,3						
	80	333	289			326	283			16,5	14,3						
	85	356	309			349	302			17,6	15,3						
	90	378	341			371	322			18,8	16,3						
	95																
	100																

**Note:** The figures stated are in kg/ha and can only be guide lines.  
The exact amount drilled can be only ascertained by physical calibration tests.  
\* = Distributorhead with 20 outlets.

1 hectare (ha) = 2,471 acres.

**Calibration chart for T 400 A (4,0 m Work. width)**

Seeds		Barley					Oats					Rye					Wheat				
Bottom flap position		1					1					1					1				
Metering wheel position		Metering wheel III					Metering wheel III					Metering wheel III					Metering wheel III				
Airflow valve position		Standard and coarse seed					Standard and coarse seed					Standard and coarse seed					Standard and coarse seed				
Row Spacing (cm)		10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*		
Metering lever position	20											77	65	67							
	25	98	83	85								98	83	85							
	30	115	98	100			93	79	81			119	101	103			127	108	110		
	35	134	114	116			110	94	95			140	119	121			149	127	129		
	40	153	130	133			127	108	110			161	137	140			171	145	148		
	45	172	146	149			144	122	125			182	155	158			193	164	167		
	50	191	162	166			160	136	139			202	172	175			215	183	186		
	55	210	179	182			177	150	153			223	190	193			236	201	205		
	60	229	195	199			194	165	168			244	207	212			256	218	222		
	65	248	211	215			211	179	183			265	225	230			280	238	243		
	70	267	227	231			229	195	199			286	243	248			302	257	262		
	75	287	244	249			247	210	214			307	261	266			325	276	282		
	80	308	262	267			266	226	231			330	281	286			351	298	304		
	85	330	281	286			286	243	248			355	302	308			378	321	328		
	90	353	300	306			306	260	265			380	323	329			405	344	351		
	95	377	320	327			327	278	284			407	346	353			432	367	375		
	100	402	342	349			348	296	302			435	370	377			459	390	398		

Notes: The figures stated are in kg/ha and can only be guide lines.

The exact amount drilled can be only ascertained by physical calibration tests.

\* = Distributorhead with 30 outlets.

1 hectare (ha) = 2.471 acres.

**Calibration chart for T 400 A (4,0 m Work. width)**

Seeds		Dressed Rape (Drill without agitator fingers)					Std. Rape					Grass seed					Clover				
Bottom flap position		2					2					1					1				
Metering wheel position		Fine seed wheel II					Fine seed wheel II					Metering wheel III					Fine seed wheel II				
Airflow valve position		Fine seed					Fine seed					Standard and coarse seed					Fine seed				
Row Spacing (cm)		10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*		
Metering lever position	5																				
	10	2,0	1,7	1,7								21	18	18			2,3	2,0	2,0		
	15	3,2	2,7	2,8								33	28	29			3,8	3,2	3,3		
	20	4,3	3,7	3,7								45	38	39			5,3	4,5	4,6		
	25	5,4	4,6	4,7			5,2	4,4	4,5			57	48	49			6,7	5,7	5,8		
	30	6,5	5,5	5,6			6,3	5,4	5,5			69	59	60			8,0	6,8	6,9		
	35	7,6	6,5	6,6			7,4	6,3	6,4			81	69	70			9,2	7,8	8,0		
	40	8,6	7,3	7,5			8,5	7,2	7,4			92	78	80			10,4	8,8	9,0		
	45	9,7	8,2	8,4			9,6	8,2	8,3			103	88	89			11,6	9,9	10,1		
	50	10,7	9,1	9,3			10,6	9,0	9,2			115	98	100			12,8	10,9	11,1		
	55						11,8	10,0	10,2			127	108	110			14,1	12,0	12,2		
	60						12,9	11,0	11,2			139	118	121			15,4	13,1	13,4		
	65						14,1	12,0	12,2			151	128	131			16,7	14,2	14,5		
	70						15,4	13,1	13,4								18,0	15,3	15,6		
	75						16,8	14,3	14,6								19,4	16,5	16,8		
	80						18,3	15,6	15,9								20,8	17,7	18,0		
	85						19,9	16,9	17,3												
	90						21,6	18,4	18,7												
	95						23,4	19,9	20,3												
	100						25,1	21,3	21,8												

**Notes:** The figures stated are in kg/ha and can only be guide lines.

The exact amount drilled can be only ascertained by physical calibration tests.

\* = Distributorhead with 30 outlets.

1 hectare (ha) = 2.471 acres.

**Calibration chart for T 400 A (4,0 m Work. width)**

Seeds		Peas					Beans					Phacelia					Sunflower				
Bottom flap position		4					4					1					3				
Metering wheel position		Metering wheel					Metering wheel					Fine wheel II					Fine wheel I+II				
Airflow valve position		Standard and coarse seed					Standard and coarse seed					Fine seed					Standard and coarse seed				
Row Spacing (cm)		10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*			10,0 13,3*	11,8	15,4*		
Metering lever position	20																				
	25	100	85	87								4,9	4,2	4,2							
	30	121	103	105			118	100	102			5,9	5,0	5,1							
	35	142	121	123			138	117	120			6,9	5,9	6,0			4,1	3,5	3,6		
	40	163	139	141			160	136	139			7,9	6,7	6,8			5,2	4,4	4,5		
	45	184	156	159			182	155	158			8,9	7,6	7,7			6,1	5,2	5,3		
	50	205	174	178			204	173	177			9,9	8,4	8,6			7,1	6,0	6,2		
	55	226	192	196			224	190	194			11,0	9,4	9,5			8,0	6,8	6,9		
	60	247	210	214			244	207	211			12,0	10,2	10,4			8,9	7,6	7,7		
	65	268	228	232			264	224	229			13,0	11,1	11,3			9,9	8,4	8,6		
	70	289	246	250			284	241	246			14,3	12,2	12,4							
	75	311	264	270			305	259	264			15,4	13,1	13,3							
	80	333	283	289			326	277	283			16,5	14,0	14,3							
	85	356	303	309			349	297	302			17,6	15,0	15,3							
	90	378	321	341			371	315	322			18,8	16,0	16,3							
	95																				
	100																				

**Notes:** The figures stated are in kg/ha and can only be guide lines.

The exact amount drilled can be only ascertained by physical calibration tests.

\* = Distributorhead with 30 outlets.

1 hectare (ha) = 2.471 acres.

## Calibration chart for T 450 A (4,5 m Work. width)

Seeds		Barley					Oats					Rye					Wheat				
Bottom flap position		1					1					1					1				
Metering wheel position		Metering wheel III					Metering wheel III					Metering wheel III					Metering wheel III				
Airflow valve position		Standard and coarse seed					Standard and coarse seed					Standard and coarse seed					Standard and coarse seed				
Row Spacing (cm)		11,3	15,0*	12,5			11,3	15,0*	12,5			11,3	15,0*	12,5			11,3	15,0*	12,5		
Metering lever position	20											77	69								
	25	98	88									98	88								
	30	115	104				93	84				119	107				127	114			
	35	134	121				110	99				140	126				149	134			
	40	153	138				127	114				161	145				171	154			
	45	172	155				144	130				182	164				193	174			
	50	191	172				160	144				202	182				215	194			
	55	210	189				177	159				223	201				236	212			
	60	229	206				194	175				244	220				256	230			
	65	248	223				211	190				265	239				280	252			
	70	267	240				229	206				286	257				302	272			
	75	287	258				247	222				307	276				325	293			
	80	308	277				266	239				330	297				351	316			
	85	330	297				286	257				355	320				378	340			
	90	353	318				306	275				380	342				405	365			
	95	377	339				327	294				407	366				432	389			
	100	402	362				348	313				435	392				459	413			

**Notes:** The figures stated are in kg/ha and can only be guide lines.

The exact amount drilled can be only ascertained by physical calibration tests.

\* = Distributorhead with 30 outlets.

1 hectare (ha) = 2.471 acres.

**Calibration chart for T 450 A (4,5 m AWork. width)**

Seeds		Dressed Rape (Drill without agitator fingers)					Std. Rape					Grass seed					Clover				
Bottom flap position		2					2					1					1				
Metering wheel position		Fine seed wheel II					Fine seed wheel II					Metering wheel III					Fine seed wheel II				
Airflow valve position		Fine seed					Fine seed					Standard and coarse seed					Fine seed				
Row Spacing (cm)		11,3	15,0*	12,5			11,3	15,0*	12,5			11,3	15,0*	12,5			11,3	15,0*	12,5		
Metering lever position	5																				
	10	2,0	1,8									21	19				2,3	2,1			
	15	3,2	2,9									33	30				3,8	3,4			
	20	4,3	3,9									45	41				5,3	4,8			
	25	5,4	4,9				5,2	4,7				57	51				6,7	6,0			
	30	6,5	5,9				6,3	5,7				69	62				8,0	7,2			
	35	7,6	6,8				7,4	6,7				81	73				9,2	8,3			
	40	8,6	7,7				8,5	7,7				92	83				10,4	9,4			
	45	9,7	8,7				9,6	8,6				103	93				11,6	10,4			
	50	10,7	9,6				10,6	9,5				115	104				12,8	11,5			
	55						11,8	10,6				127	114				14,1	12,7			
	60						12,9	11,6				139	125				15,4	13,9			
	65						14,1	12,7				151	136				16,7	15,0			
	70						15,4	13,8									18,0	16,2			
	75						16,8	15,1									19,4	17,5			
	80						18,3	16,5									20,8	18,7			
	85						19,9	17,9													
	90						21,6	19,4													
	95						23,4	21,1													
	100						25,1	22,6													

Notes: The figures stated are in kg/ha and can only be guide lines.

The exact amount drilled can be only ascertained by physical calibration tests.

\* = Distributorhead with 30 outlets.

1 hectare (ha) = 2.471 acres.

## Calibration chart for T 450 A (4,5 m Work. width)

Seeds		Peas					Beans					Phacella									
Bottom flap position		4					4					1									
Metering wheel position		Metering wheel					Metering wheel					Fine seed wheel II									
Airflow valve position		Standard and coarse seed					Standard and coarse seed					Fine seed									
Row Spacing (cm)		11,3	12,5				11,3	12,5				11,3	12,5								
Metering lever position	20																				
	25	100	30									4,9	4,4								
	30	121	109				118	106				5,9	5,3								
	35	142	128				138	124				6,9	6,2								
	40	163	147				160	144				7,9	7,1								
	45	184	166				182	164				8,9	8,0								
	50	205	185				204	184				9,9	8,9								
	55	226	203				224	202				11,0	9,9								
	60	247	222				244	220				12,0	10,8								
	65	268	241				264	238				13,0	11,7								
	70	289	260				284	256				14,3	12,9								
	75	311	280				305	275				15,4	13,9								
	80	333	300				326	293				16,5	14,9								
	85	356	320				349	314				17,6	15,8								
	90	378	340				371	334				18,8	16,9								
	95																				
	100																				

Notes: The figures stated are in kg/ha and can only be guide lines.

The exact amount drilled can be only ascertained by physical calibration tests.

\* = Distributorhead with 30 outlets.

1 hectare (ha) = 2.471 acres.





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