Bestell-Nr. 9900.00.82GB01

Operating Instruction
Calibration charts

Mounted Seed Drills
Multidrill M

EC Declaration of Conformity

according to Directive 89/392/EEC

We **RABEWERK GmbH+Co.**

Am Rabewerk, D-49152 Bad Essen

declare under our sole responsibility, that the product

Seed Drill MULTIDRILL

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

i.V. Michael Bruse

Michael Bruse,
Service-Manager

Contents **Page**

RABE WERK

Operating Instruction

FOR SEED DRILLS

Multidrill

Before Use

Ensure operators have read and are familiar with the instructions contained in this manual and that the seed drill is not operated by untrained persons.
The seed drill is an 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 maschine is inproperly used or non- genuine parts or any other parts or components are fitted which are not released by RABEWERK.

Only authorized and skilled RABEWERK dealer technicians, nationel distributors or factory own service engineers are allowed to undertake repairs under warranty.

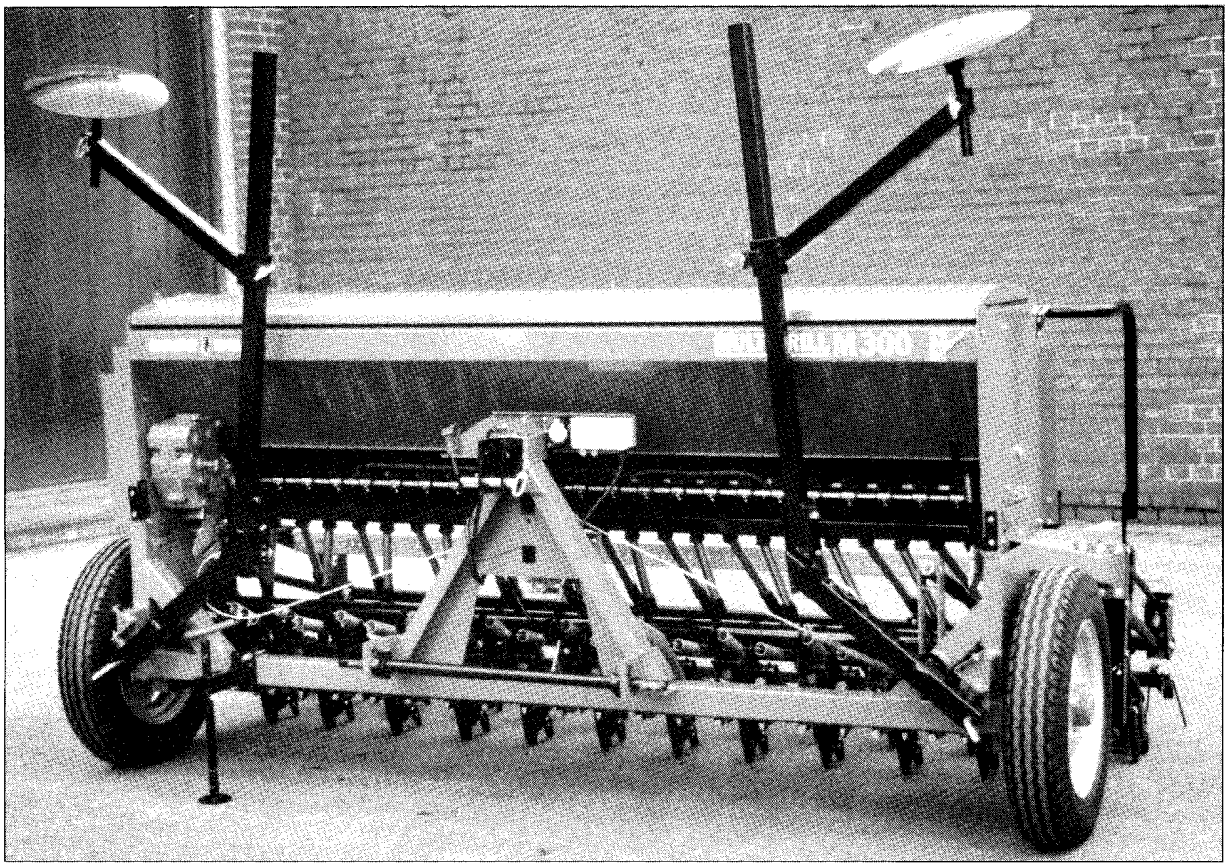
Important: The operator must carry out regular checks to ensure that the seed coulters are not blocked and that seed flow is unhindered.
RABEWERK accept no liability for consequential demages of any kind.

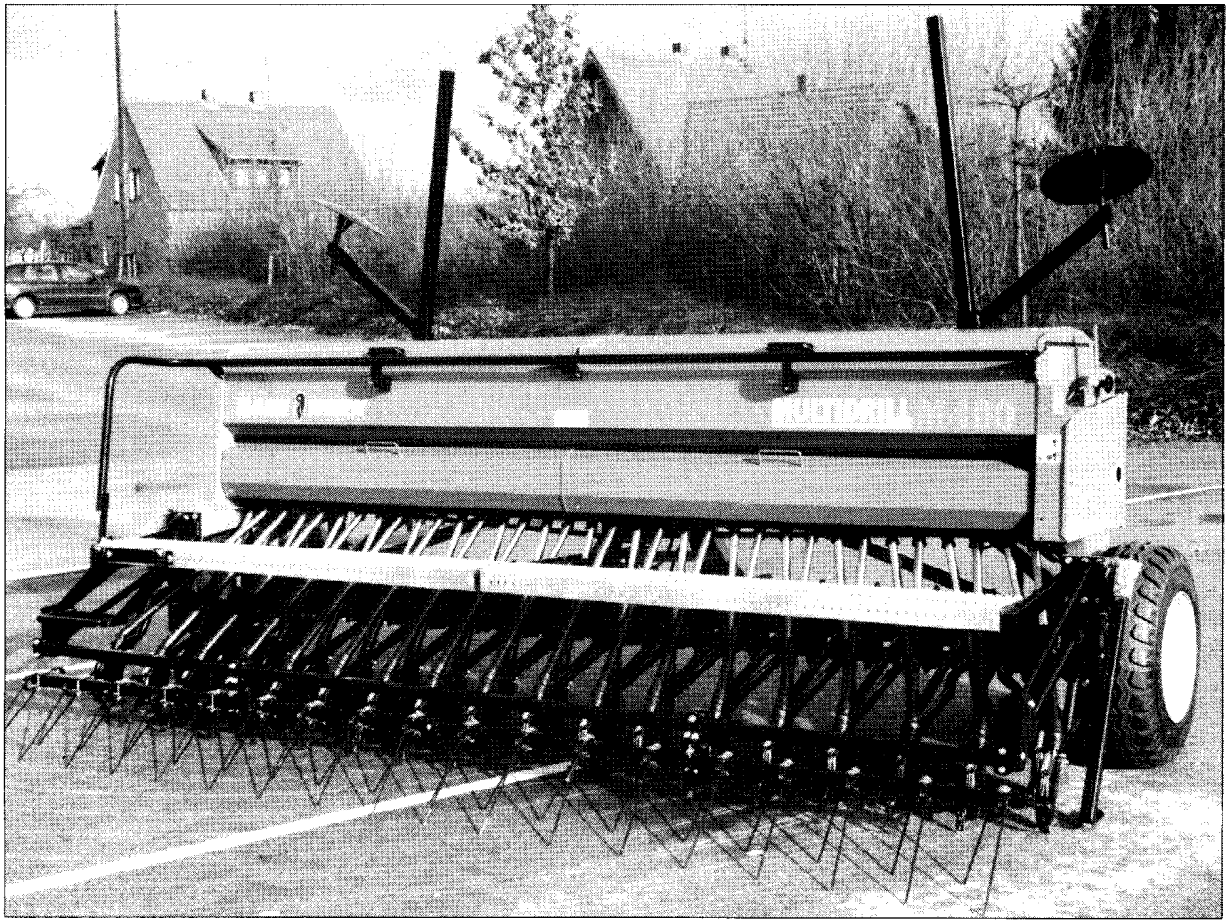
Safety Precautions

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 especially with full hopper to compensate the rear mounted implement.
Never allow people during operation to stand or, sit on machine, or the filling platform.
Never touch any moving parts which may be hot from operation.

No. 126-2-95 GB





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.

Never allow people during connecting or disconnecting the drill to stand between tractor and maschine. Or when any spoolvalve or remote control is operated.
Insure when lifting the seed drill that the set of markers (in vertical / transport position) cannot collide with e.g. rear screen of tractor.

Warning. Never transport seed drill with full hopper.
Never put your hand in hopper or leave any items in the hopper.
The agitator shaft starts turning immediately when the seed drill is in motion. Also in '0' position of gearbox.

Use appropiate protective clothings when in contact with chemical seed treatment.
On steep hill sides or slopes it may be dangerous to raise the seed drill when carried in drill lift especially in raised position.

Brief description of the MULTIDRILL seed drill

The MULTIDRILL is a conventional mechanical working drill available in two design concepts.
The mounted version is fixed permanently on a rotary harrow or similar purpose machine.
The metering system is driven by a special ground wheel.
The tractor mounted SOLO version is used in the 3-point linkage of the tractor and runs on its own wheels during work from which the metering system is driven.

One of the unique features of the MULTIDRILL is the progressive design of the MULTIPURPOSE seed wheels which are adjustable to distribute seed, e.g. oil seed rape or other fine seed also at very reduced seed rates.
Or by changing the turning direction of the metering shaft there are little indentations on the three lines of pegs which are then become active picking up single grains for extremely low rates of apprx. 1000 gram/ ha. This is applicable to any kind of fine seed in the range between 1,8 mm - 2,8 mm and can only be compared with precision drilling.
The pressure on the coulters can be adjusted individually on each coulter or centrally.
The agitator shaft can be disengaged from outside the hopper.
The hopper is water - and dust proof with standard fitment of a low level indicator.
Change- over from the standard Universal Coulters (Suffolk Coulters) to Band Seed- or single Disc Coulters is achieved by an unique concept without the use of tools.
For calibration the drill does not need to be lifted.

A wide range of optional eqipment is available, eg. different types of rear harrows, electronic tramline control or electronic low level device and seed wheel monitoring.

Operating Instruction

(Three point) Tractor mounted MULTIDRILL

Mounting (Fig. 1 & 4)

The drill can be carried in the 3-point hitch (Cat II) or directly in the permantly fitted A- frame. To engage the A- frame securely there is an special optional lock available. Also Cat. I (1 Fig. A) lower link pins as an option for M 250 and M 300 models.
By means of adjusting the top link make sure that the drill is in horizontal level position to the ground.
Do not allow too much side play of the lower link arms of the tractor. In lifted position they must be rigid.
Connect the single-acting hydraulic hose for the markers and also the electronic monitor for the tramline operation (12 Volt). To releave the plug and to avoid misfunctions the cable must be connected with three loops on the special hook provided (Fig.4).
The tramline control will only work if the **headlights of the tractor are switched on in dim position).**
The seed drill should be filled only after the drill is connected to the tractor and must be empty before disconnecting.
Assure level surface when parked. The seed drill is resting on the depth adjustable stands provided at the front and rear of maschine. The eradicator tines must be raised.

Wheels and tyres (Fig. 2)

When 6.00-16 wheels are fitted with the hub turned inside the model M 300 has a transport width of 300 cm.
In sticky soil condition it might be necessary to turn the wheels around to increase the distance between wheels and frame (Fig.2). The transport width is then over 300 cm and must be turned back for transport on public roads if not tolerated by national regulations. But the wheel will then run in work another time in the same track when coming back.
With wheels 10.0/75-15.3 the transport width is 318 cm and over the tolerated maximum width on public roads in certain European countries.
Keep scrapers always adjusted tight to the wheels.

Standard (X*) and option (X) of tyres fitted:

Model	6.00-16	10.0/75-15.3	31x15.50-15
M 250	X*	-	-
M 300	X*	X	X
M 400	-	X*	X
M 450	-	X*	X

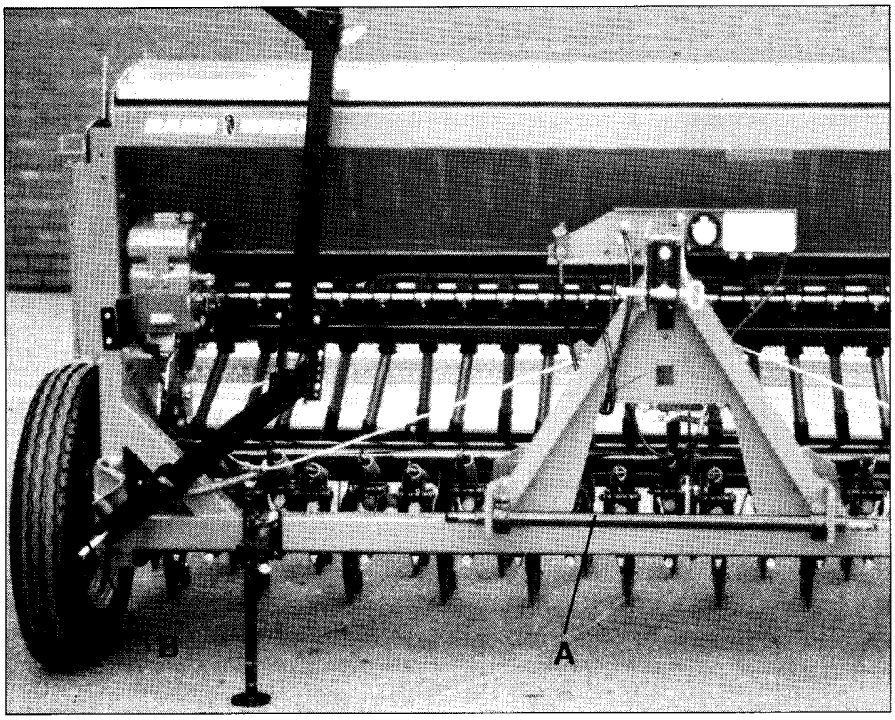


Fig. 1

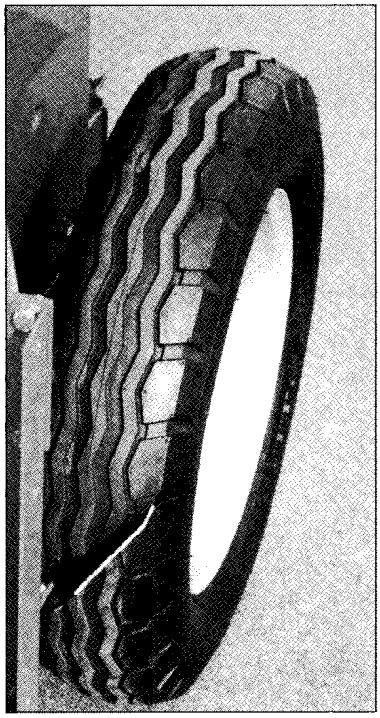


Fig. 2

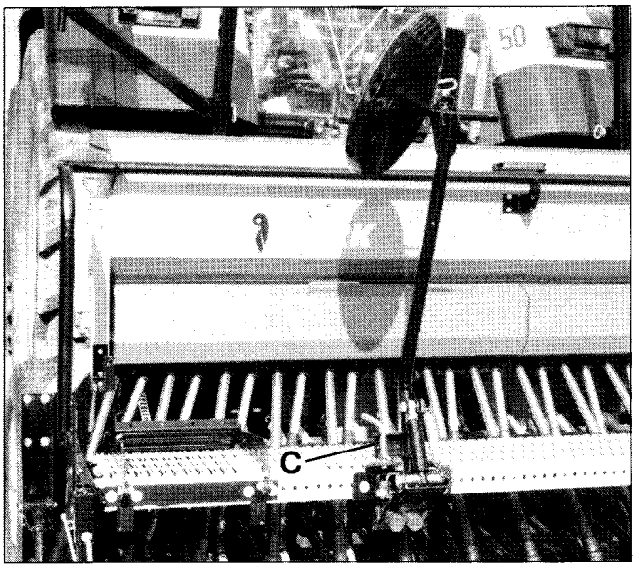


Fig. 3

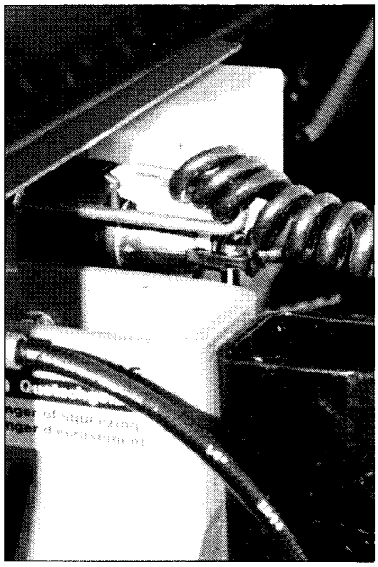


Fig. 4

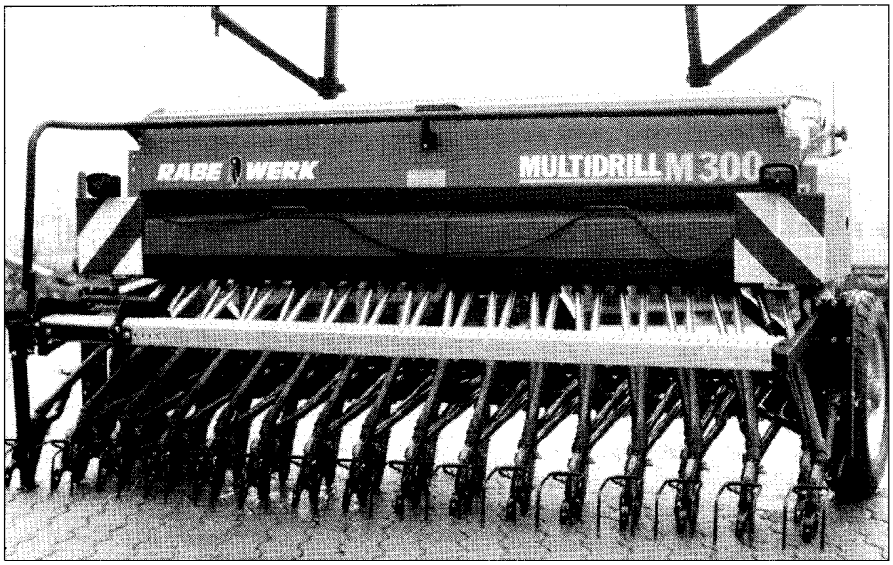


Fig. 5

Tyre pressure:	6.00-16	= 1,2 bar
	10.0/75-15.3	= 0,8 bar
	31x15.50-15	= 0,5 bar

NOTE: To avoid transport damages the tyres are often under higher pressure than required when supplied by the manufacturer. **Before initial operation adjust tyre pressure according to above stated specification.** An exact seedrate is dependant on accurate tyre pressure!
The seed drill must be supported securely if the wheels are taken off.

Transport position (Fig. 1, 3, 5)

Close the lid on the hopper and fold-in marker arms and lock with pins (1 Fig. B).
If equipped with additional pre-emergence markers they must be lifted out of work and locked (3 Fig. C). If necessary cover the discs or remove them. For road transport a special safety cover for the PERFECT rear harrow can be obtained (optional equipment).
Adjust the lower link arms of the tractor in rigid position and raise parking stands.

Warning: Obey the national road regulations also with regard to transport width (refer to chapter WHEELS). Fit rear lights and warning boards if required. For 4,0 and 4,5 m models a special transport trailer is offered.

Multifunction system of seed wheels (Fig. 6, 7, 8, 11)

Due to the unique design of multifunction seed wheels most kinds of seed can be metered at a very precise rate. Four positions are available:

Standard

Lower Discharge System (Fig 6)
Suitable for all coarse seed (e.g. grain) up to the size of peas and small beans.
Fine seed fingers in NEUTRAL position or not fitted.

Options

Lower Discharge System in reduced position (Fig 7)
Suitable for all coarse seed but at reduced seedrates, e.g. Hybrid Rye 40 - 60 kg/ha
Fine seed fingers fixed in REDUCED position

Lower Discharge System with blanking-off cover (Fig. 11)
Best for oil seed rape at seed rates between 3,0 - 8,0 kg/ha or Phacelia etc.
Special blanking-off covers fitted (Pt/no 9106.00.46)

Upper Discharge System (Fig.8)
Best for oil seed rape at very low seed rates between 1,0 - 3,0 kg/ha
Fine seed fingers fixed in CENTRAL position

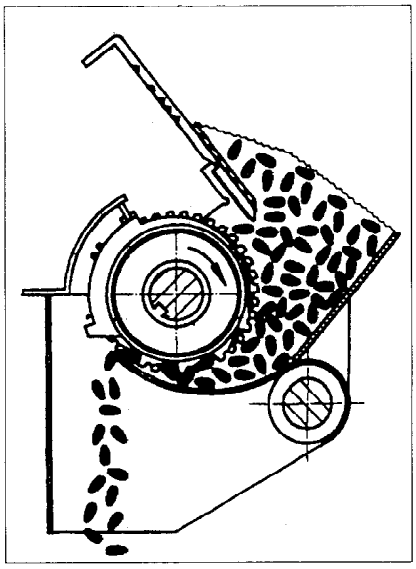


Fig. 6

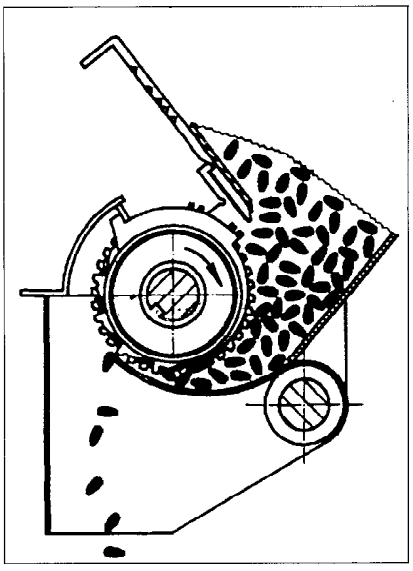


Fig. 7

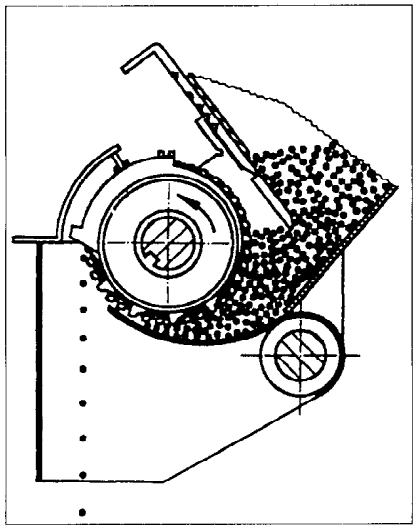


Fig. 8

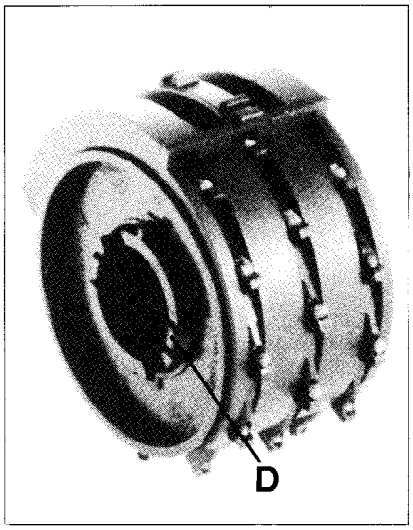


Fig. 9

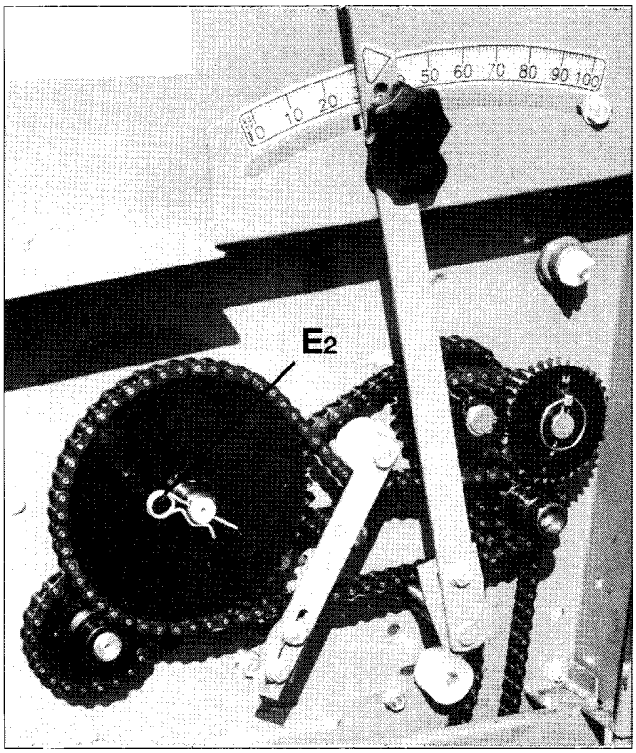


Fig. 10

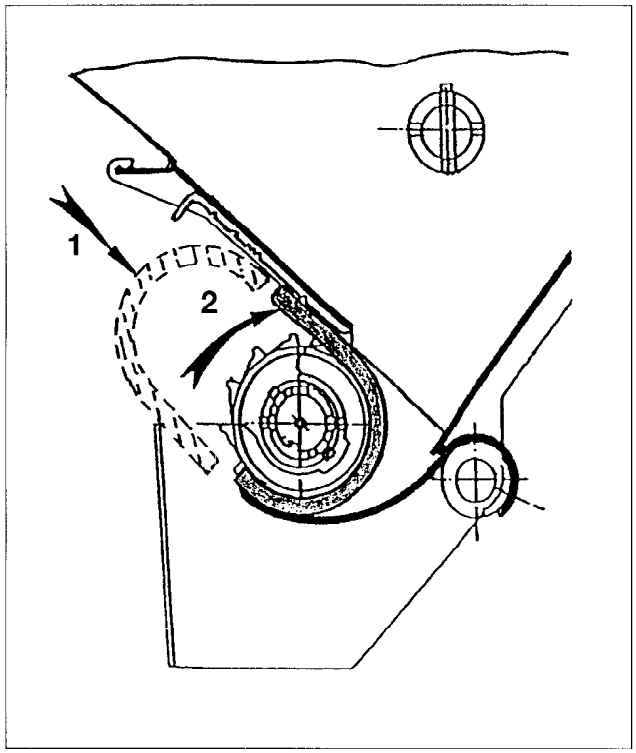


Fig. 11

Benefits of the Upper Discharge System (Fig 9)

By changing the turning direction of the seed wheels the little identations on the three lines of pegs are active now and picking-up each single grain and dropping them one by one into the seed pipes (Fig.9). The result can only be compared with precision drilling with an improved plant spacing. Yields are increased by an optimum plant population and development combined with a saving of seed.
The upper discharge system is suitable for all round shaped fine seeds in the range of 1.8 - 2.8 mm diameter like oilseed rape or cabbage seed.

Note:
Depending on the type of seed dressing used the little identations on the pegs of the seed wheels can block up and must be kept clean by means of a brush.
There are limits for this system depending on the degree of tilt on slopes.
Over 20 % slope use the Lower Discharge System with the blanking -off covers fitted.

Seed rate setting

The following adjustments must be carried out in accordance with the calibration chart:

a) Choose turning direction of the metering shaft
   * for Standard (Lower) Discharge
   * for Upper Discharge

b) Position of fine seed fingers (if required)

c) Fitment of blanking- off covers (if required)

d) Position of slide gates

e) Position of bottom flaps

f) Seed rate adjustment with gearbox lever

g) Agitator shaft (engaged or disengaged)

Ref. a) **Turning direction of metering shaft** (Fig. 12, 13)

Remove cover fitted on r.h. side of seed drill.

Standard (lower) Discharge System (or in reduced position).
For clockwise turning of seed wheels fit collar (12 Fig. E).

Upper Discharge System
For anti- clockwise turning of seed wheels fit large gear (13 Fig. E1) with the spacer fitted behind gear

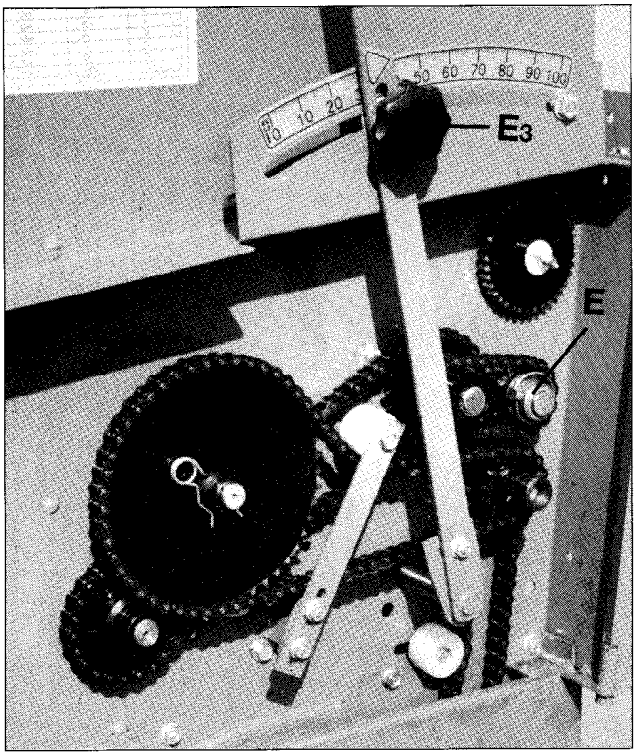


Fig. 12

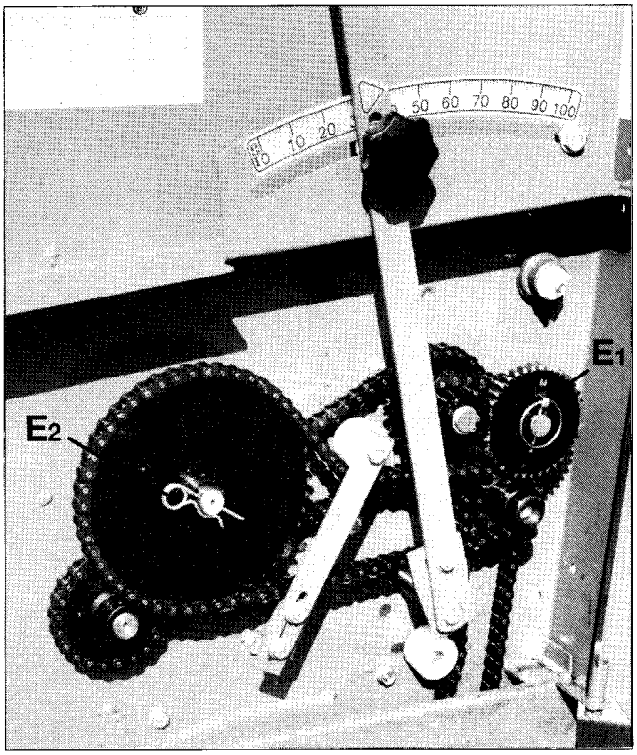


Fig. 13

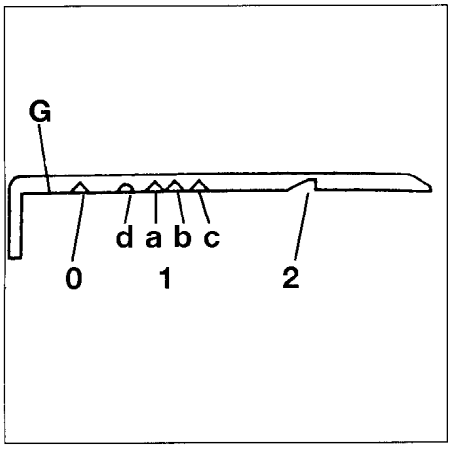


Fig. 14

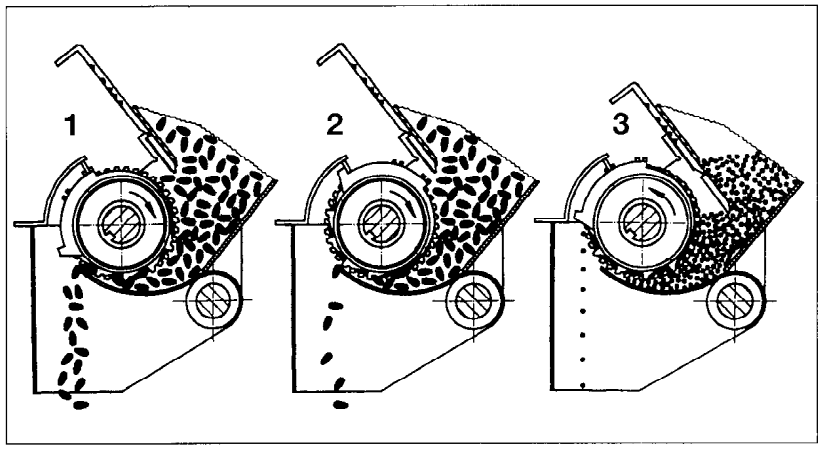


Fig. 15

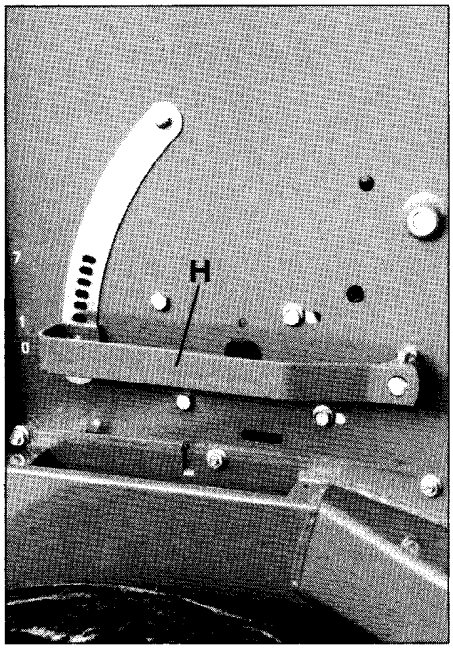


Fig. 16

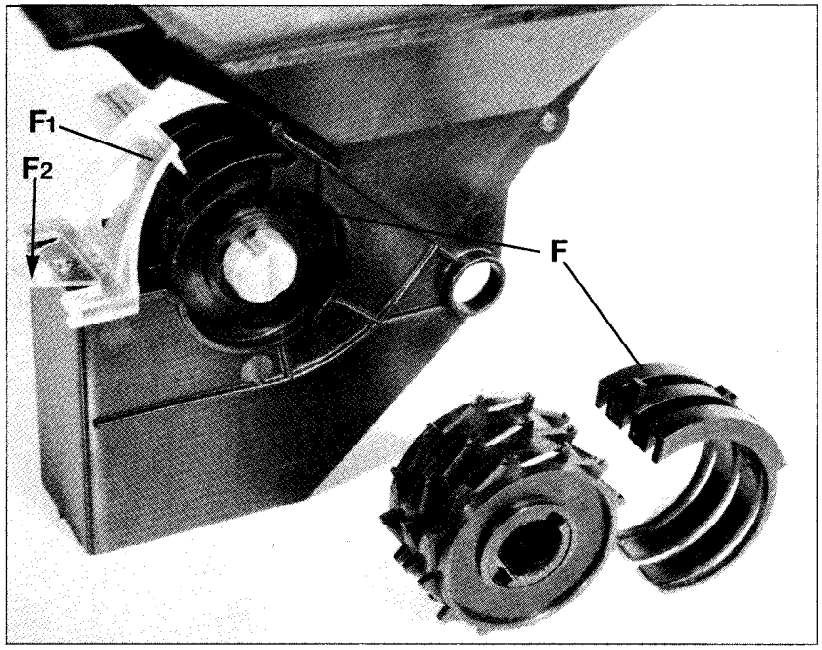


Fig. 17

Ref. b) **Fine seed fingers** (Fig. 15, 17)

To be adjusted in different positions with the notch (Fig. 15) engaged in slots.

Standard Lower Discharge - Engaged in NEUTRAL front slot (Fig. 15/ 1) or completely removed

Reduced Lower Discharge - Engaged at rear stop (Fig. 15/2 & 17)

Upper Discharge - Engaged in central slot (Fig. 15/3)

For any coarse seed in Standard (lower) Discharge position the fine seed fingers (17 Fig. F) and the clamp (17 Fig. F1) can be removed completely because they are without function.
To remove the clamp lift clamp (17 Fig. F2) slightly and remove rearwards.

Ref. c) **Blanking - Off Covers** (Fig. 11)

They are recommended to be used when for e. g. oil seed rape or other fine seed like mustard or Phacelia seed rates of apprx. 3 - 30 kg/ha are required. The seed wheels are turning clockwise in the Standard (lower) Discharge position.
The covers can be pushed as illustrated (11 Fig. 1/2) easily in a position behind the metering wheel to blank - off two lines of pegs with only one line left activ.
For fitment shift adj. lever for bottom flaps (16 Fig. H) in position 3 and open slide gates completely in slot 2 (Fig. 14) position. All fine seed fingers must be removed.

Ref. d) **Slidegates** (Fig.14)

There are four slot ranges (14 Fig. a-d) and

	slot position	0 = Closed 2 = Fully Open
Standard (Lower) Discharge	slot 2 opened	Slidegates fully
Upper Discharge	slot 1a	for well flowing seed (incrusted or natural)
	slot 1b	for normal flowing seed (powder dressed or talced)
	slot 1c	for poor flowing seed and oil seed rape (TGW › 6 g)
	slot 1d	for extremely well flowing seed and when vibrations are transmitted from power harrow.

Ref. e) **Bottom flap adjustment** (Fig.16)

The lever (16 Fig. H) on the side of the hopper is adjustable from 0 to 7 taking care of the different grain sizes and to control the flow of the seed.

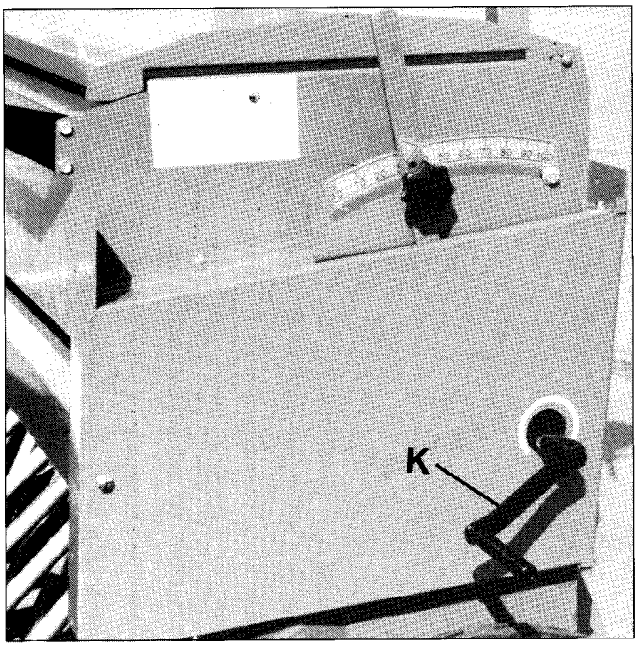


Fig. 18

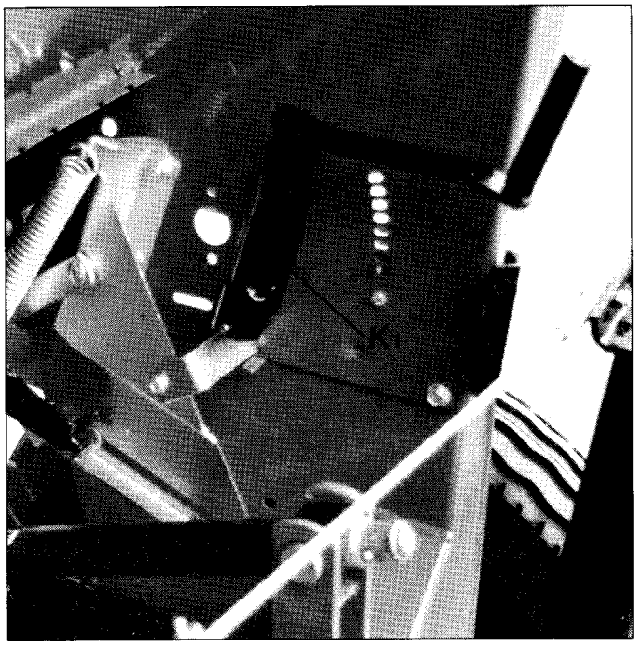


Fig. 19

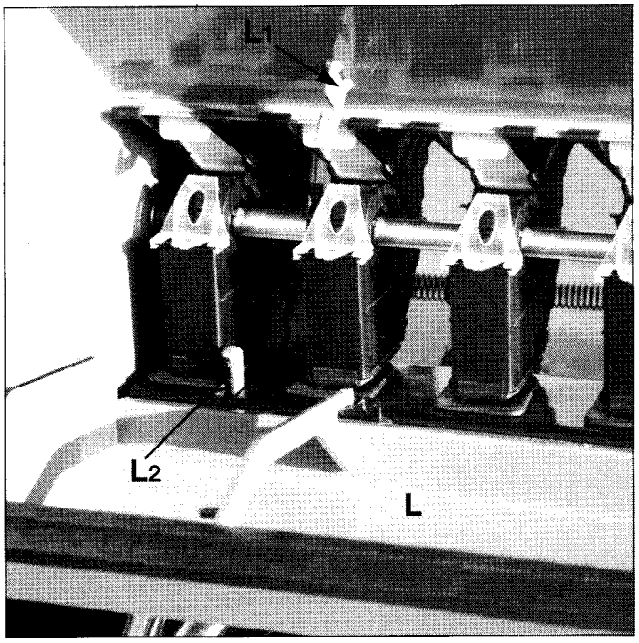


Fig. 20

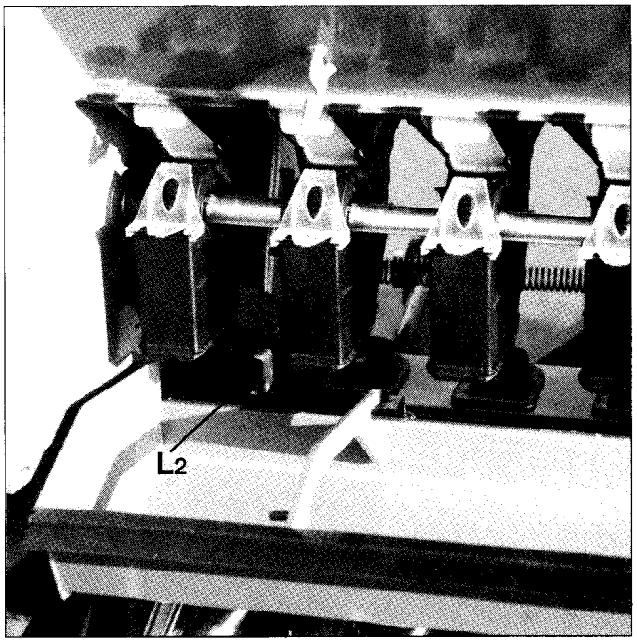


Fig. 21

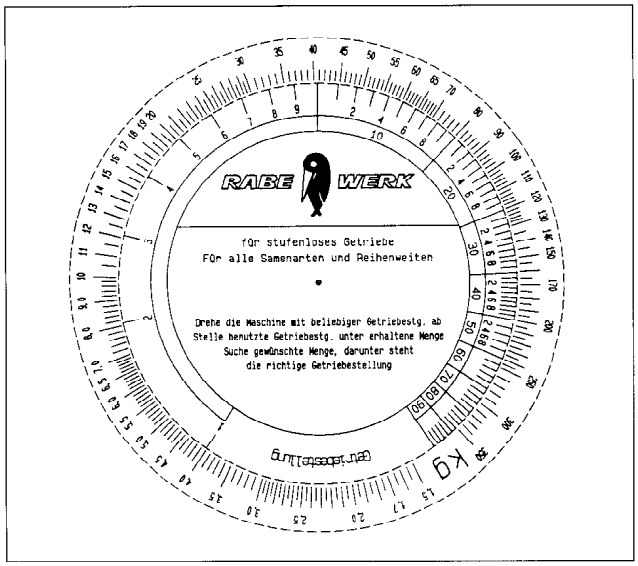


Fig. 22

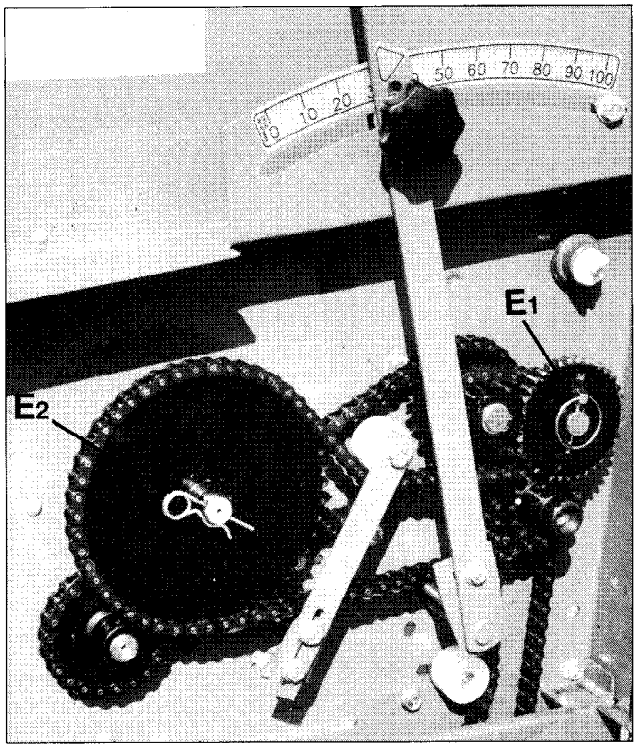


Fig. 23

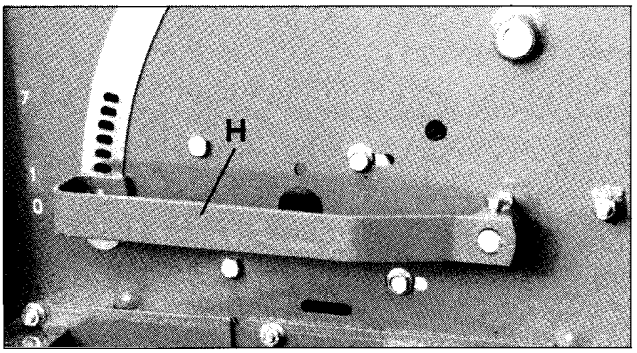


Fig. 24

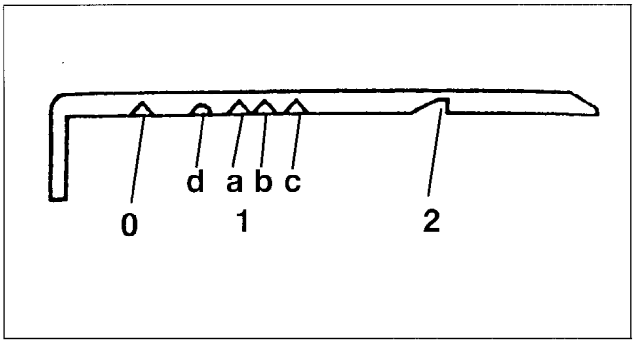


Fig. 25

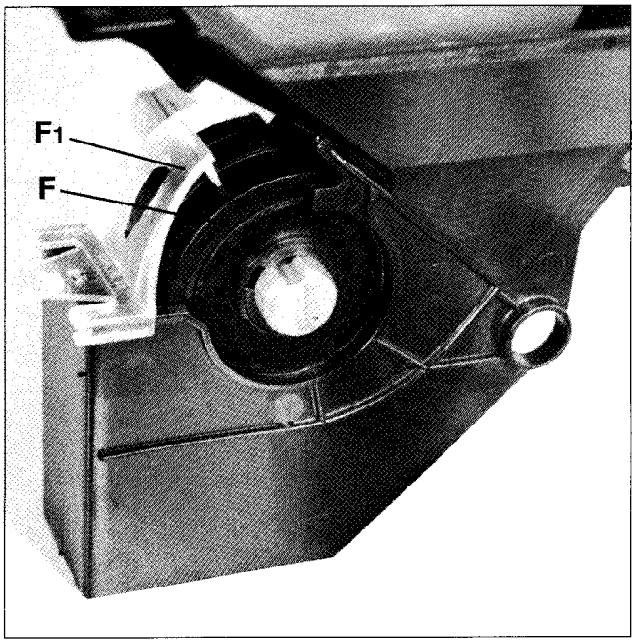


Fig. 26

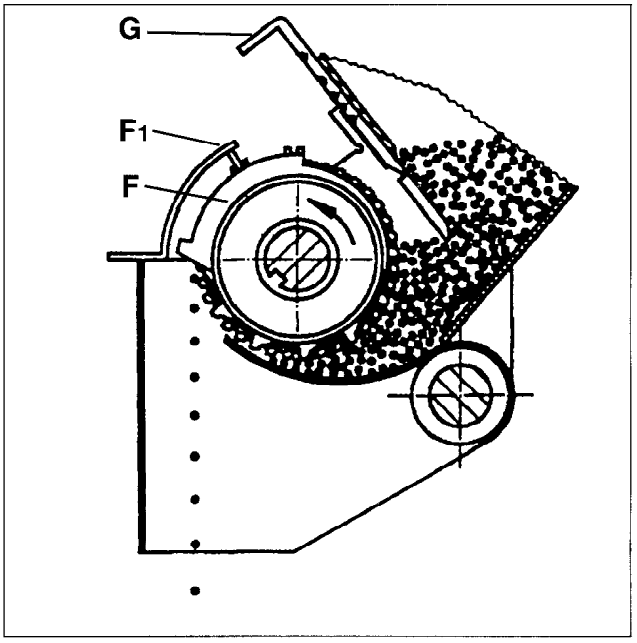


Fig. 27

The correct position is stated in the calibration chart. Do not adjust the bottom flaps too tight or the grinding or cracking of seed may occur. They are made out of stainless steel and are flexible for foreign objects in the seed, due to the spring-mounted design.
The 0-position is provided for any basic calibration of the bottom flaps which should be done at least once every year or before the new drilling season (refer to maintenance).

Ref. f) **Seed rate** (Fig. 12)

The oilbath gearbox can be infinitely adjusted (0 - 100) to increase or decrease the seed rate by the revolutions of the metering shaft by means of different lever positions (12 Fig. E3). At 0 position the metering shaft is not turning. (The setting is indicated on the r.h. side of the lever). Make sure that after setting the seedrate the metering lever is securely tightened (12 Fig. E3).

Ref. g) **Agitator shaft** (Fig. 13)

The agitator shaft ensures constant and uniform supply of seed to the seed wheels but can be disconnected by means of removing the R-clip (13 Fig. E2).
Disconnecting the agitator shaft is recommended for all well flowing seed like peas or beans, sometimes also for grain or certain types of grass seed.

Calibration test (Fig.18, 19, 20, 22)

Because of the differences in specific weight, size and shape of grain, also the kind of dressing and method of treatment the figures stated in the calibration chart can only be used as a guide. The exact amount drilled can only be ascertained by physical calibration tests. In case of differences with the required seed rate another calibration test must take place with a different position of the metering lever.

Even without the use of the calibration chart the required seed rate can be ascertained using the results of an initial calibration test at any position of the metering lever.
Or use the SEED RATE DISC (Fig.22) as explained on rear side of it.

Example: Required seed rate = 160 kg/ha
Physically tested = 120 kg/ha at lever position 30 on the scale

Formula:

160 kg/ha = ? Lever position (30) x required seed rate (160)
120 kg/ha = 30 Physically tested rate (120) = 40

The new position for the metering lever should be 40 but must be confirmed by a further calibration test.

The calibration test can be performed without lifting the drill by using the crank handle (18 Fig. K). The same crank handle is used to adjust the coulter pressure and is stored on a special holder (19 Fig. K 1):

* Park the Drill on level ground and make sure that all slide gates for the inactive rows are closed.
* The tramline control must be switched in neutral position with all seed wheels working.

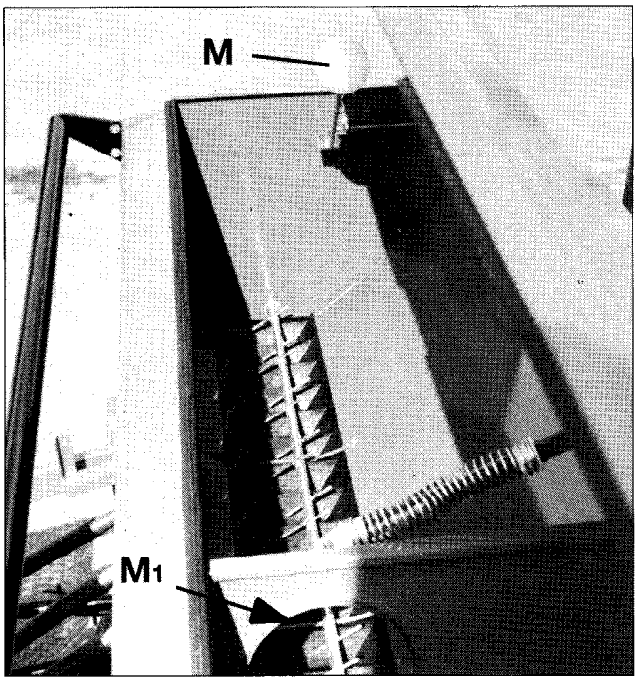


Fig. 28

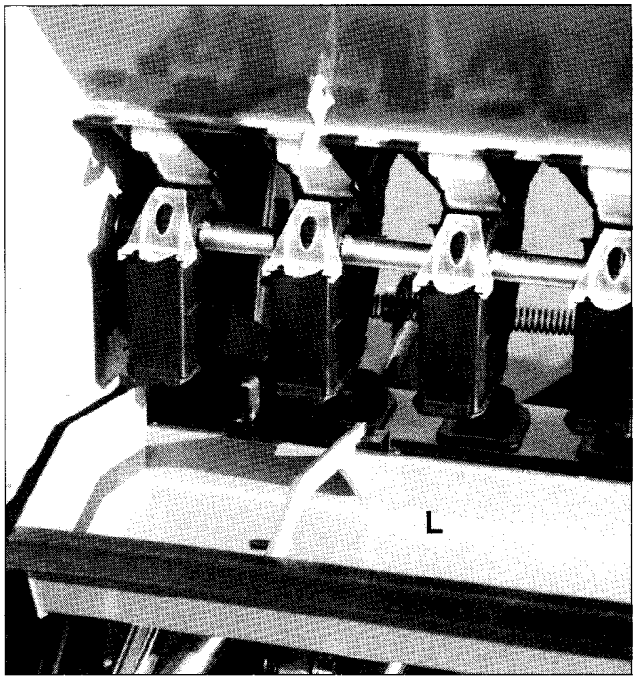


Fig. 29

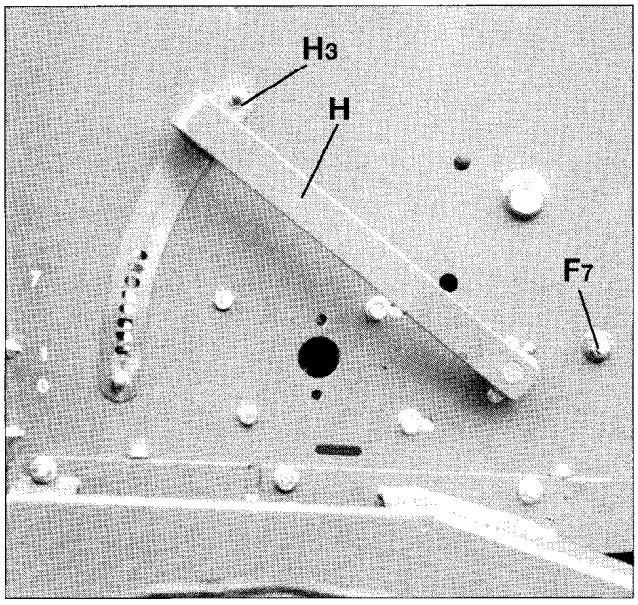


Fig. 30

According to the settings stated in the Seed Rate Chart:

* Choose the recommended system of seed wheel turning.
* Adjust fine seed fingers or blanking-off covers, slide gates and bottom flaps into correct position
* Select lever position of seedrate adjustment lever
* Engage or disengage agitator shaft according to instructions

Now the calibration trays (20 Fig. L) can be lifted (20 Fig. L1) into a level position for collection of the seed.
The seed pipe rail can be disengaged on both sides (20 Fig. L2) and by moving forward automatically engaged into calibration position (Fig.21).
The seed can then be filled into the hopper.
It is essential to do first approx. 20 turns clockwise with the calibration crank to ensure that all seed wheel housings are completely filled with seed and also to stabilize the behaviour of the flow of seed e.g. settlement of seed dressing on funnel surfaces.

Empty the calibration trays and start with the actual calibration test.

Turn the crank clockwise (18 Fig. K) according to the number of turns stated in the chart below. Common pratice is to test for 1/40 ha = 250 sq.m. If a very low seedrate is required (e.g. oil seed rape) a test for 1/10 ha = 1000 sq.m. is recommended.
Do not turn too fast. Only approx. 1 turn per second.
The seed delivered into the trays can then be weighed. The weight has to be multiplicated by 40 or 10 which equals the rate in kilogram per hectare (Kg/ha).

Number of crank turns for calibration

Working width	Tyres			
	6.00-16		10.0/75-15.3; 31x15.50-15	
	1/40 ha	1/10 ha	1/40 ha	1/10 ha
2,5 m	101	405	-	-
3,0 m	85	340	79,5	318
4,0 m	-	-	59,5	238
4,5 m	-	-	53	212

Drilling oil seed rape in UPPER DISCHARGE position (Fig. 24)

With this progressive system the standard seed rate evaluation can be considered under normal European climate conditions. 40 plants per square meter spread even over the area can be considered as an optimum for fully grown plants to be harvest. But depending to the type of soil variations of this figure will not have a noteworthy effect on yields. Using the unique „Upper Discharge" system reduced plant populations are achievable resulting in increased yield.

Check list before operation (23, 24, 25, 26, 27)

- Adjust bottom flaps with central adjustment lever (24 Fig. H) in position 0.
- Disengage agitator shaft by disconnecting R-clip (23 Fig. E2)
- Adjust fine seed fingers (26 & 27 Fig. F / F 1) at central notch position.

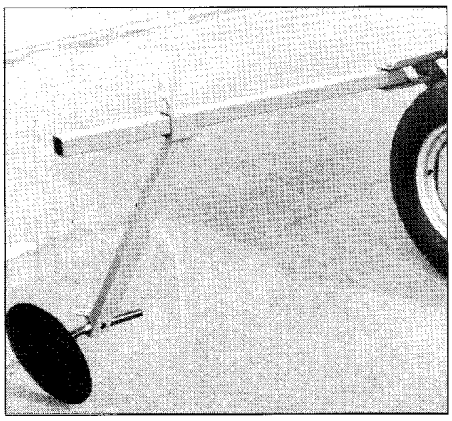


Fig. 31

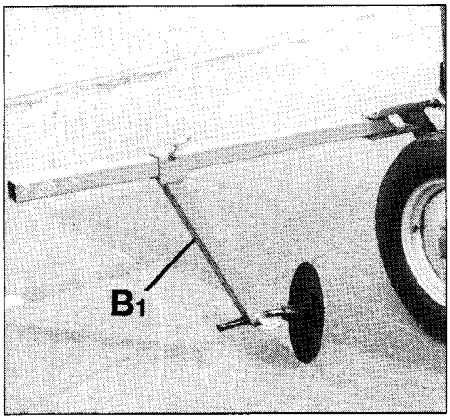


Fig. 32

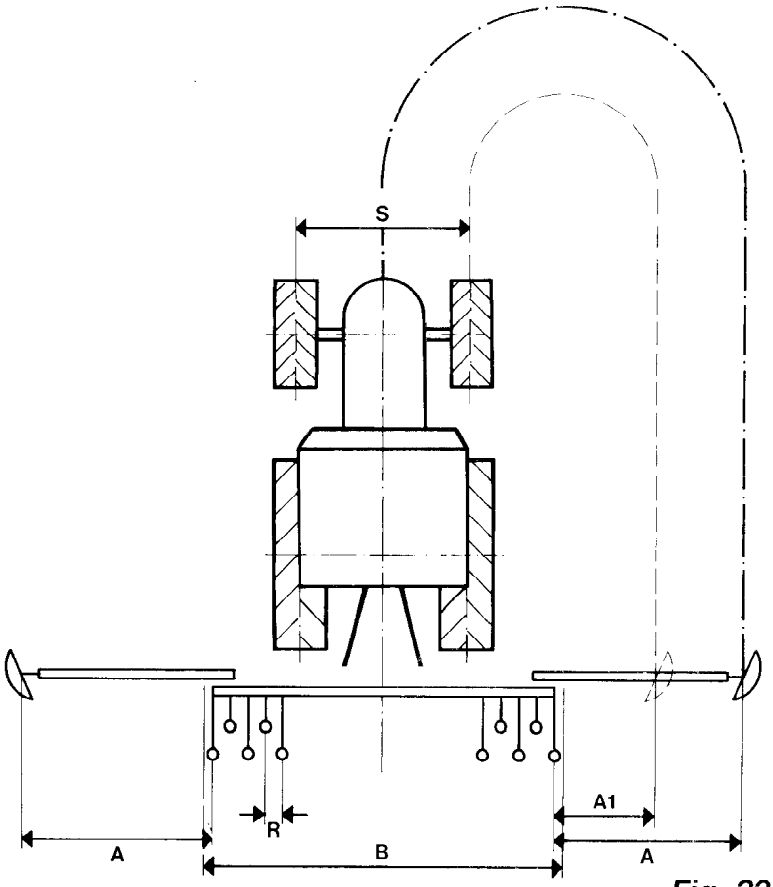


Fig. 33

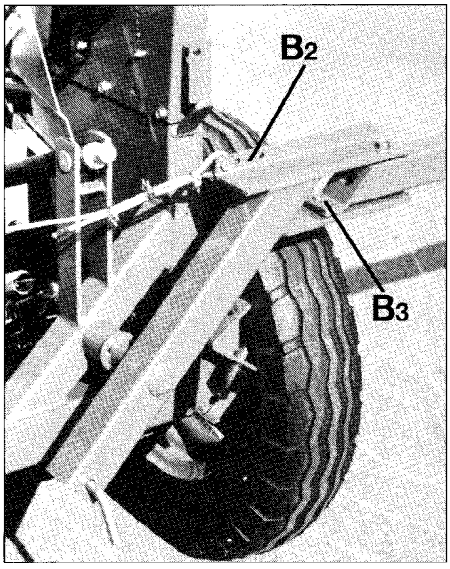


Fig. 34

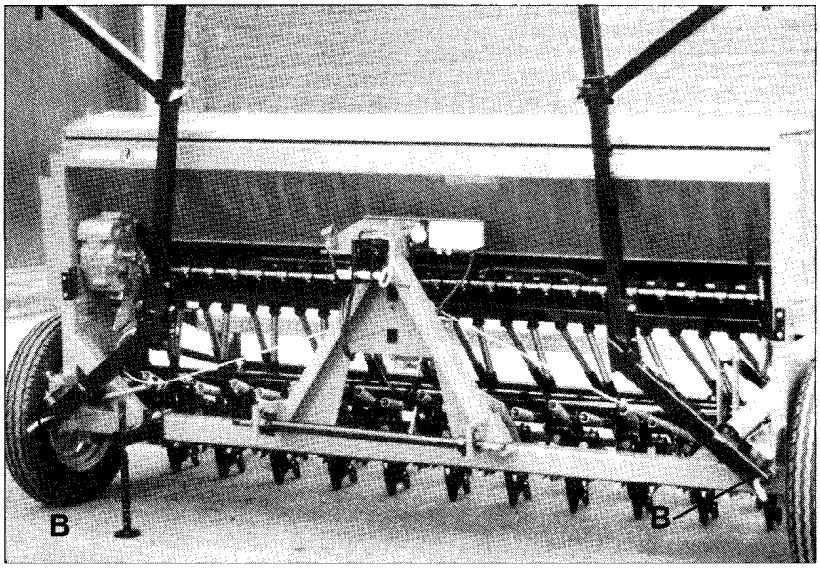


Fig. 35

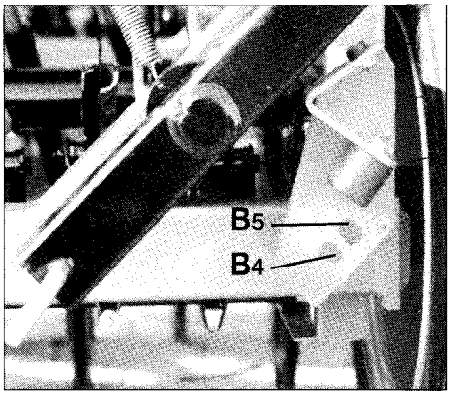


Fig. 36

• With dressed seed fill hopper not more than one quarter, with untreated seed up to half only.
• Adjust slide gates (25 Fig. G) according to condition of rape in one of the notches a - d (25 Fig. 1).
• Fit gear (23 Fig. E 1) to drive metering shaft in opposite direction/ Upper Discharge.
• Proceed with calibration test

- **Suited seed types**

Any oil seed rape seed, cabbage or cabbage type of seeds in the range of sizes between 1.8 and 2.8 mm.
Unless the seed wheels are regularely checked and cleaned, oiled or powdered seed is not recommended because of the danger that the little indentations on the seed wheels becoming caked. The same applies to seed treated with powdered soapstone.

Note: If dressed seed is used check all seed wheels regularly (every 2-3 hours) if clean. Keep clean with suitable brush.
Do not exceed speed limits stated in seed chart. Maximum is apprx. 6 km/h.
Above 15 % slope the speed must be reduced to 3,5 km/h or the seedrate may vary from going uphill or downhill.

Hopper (Fig. 28)

Filling of hopper must take place only when the drill/combination is lowered on the ground and the ball for the low level device (28 Fig. M) is out of the way.

Road transport with full hopper can be dangerous!

Emptying of hopper (Fig.21,29, 30)

After disengaging the sideways fitted levers (21 Fig L 2) the calibration trays can be folded down and moved under the discharge outlets of the seed wheels (29 Fig. L).
To completely open the gap under the seed wheels move the central adjustment lever (30 Fig. H) above notch 7 against stop.
Also all slide gates must be opened.
Clean te hopper with compressed air. But take care of toxic dust from the seed dressing. To wear protective clothing may be necessary.
For longer standstill of machine slide gates and bottom flaps should stay open to avoid damages of internal parts by rodents.

Marker arm setting (Fig. 31, 32, 33 34)

The disc markers are adjustable to the tractor wheel mark or centrally to the tractor (Fig. 33).
The normal position of the marker disc is on the arm as illustrated at Fig. 31.
But if necessary the disc can be fitted reversed (32 Fig. B1) very closed to the seeddrill.

Formula

Centre marking: Length of marker arm setting measured from most outward fitted coulter

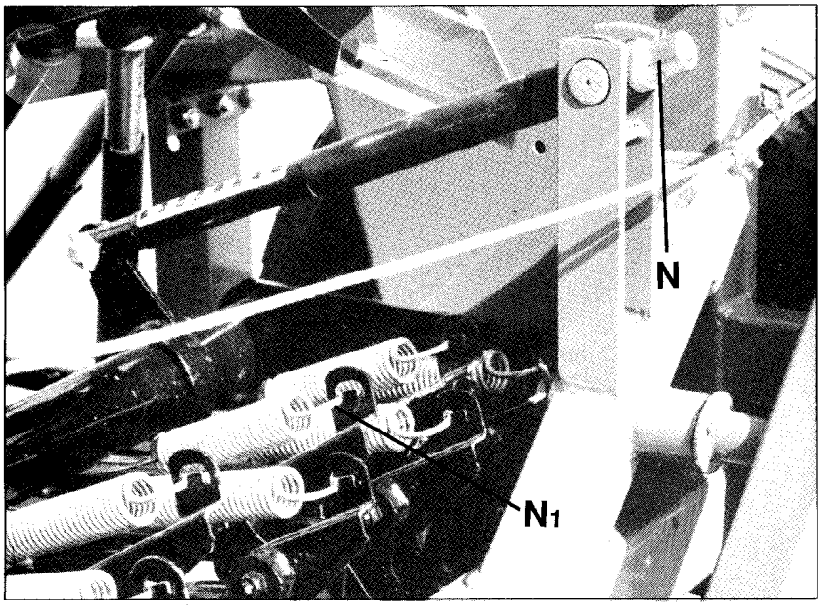


Fig. 37

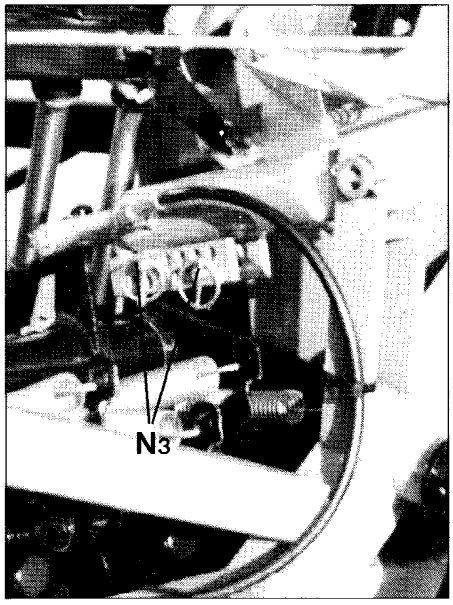


Fig. 38

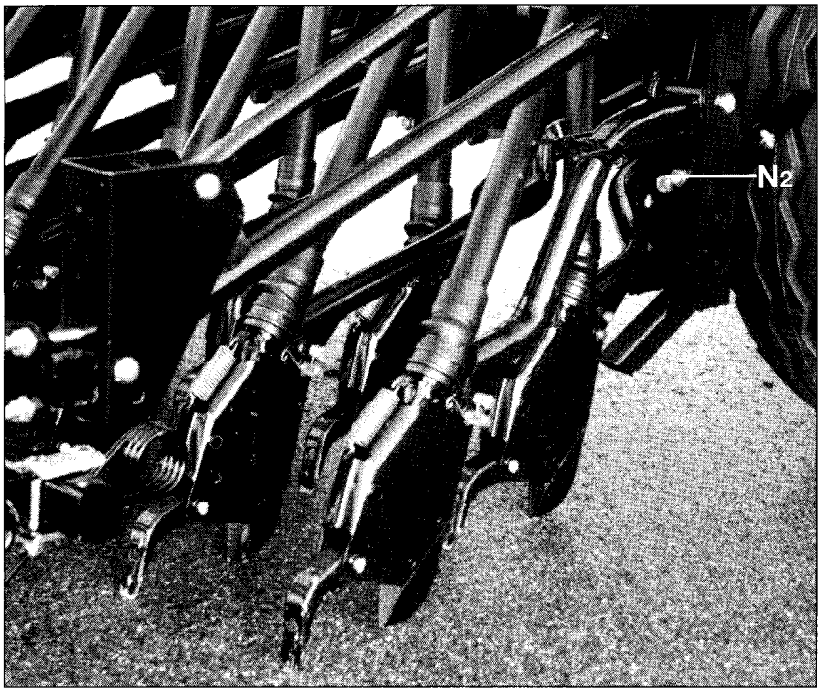


Fig. 39

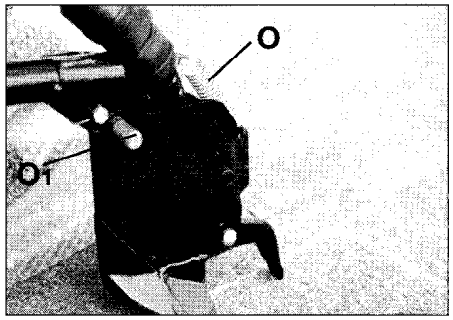


Fig. 40

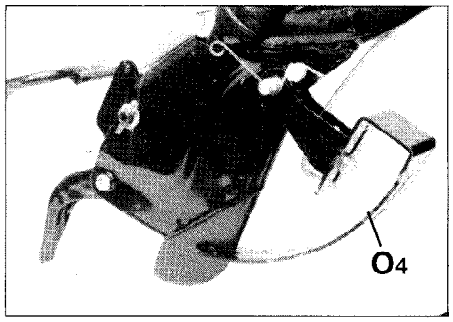


Fig. 41

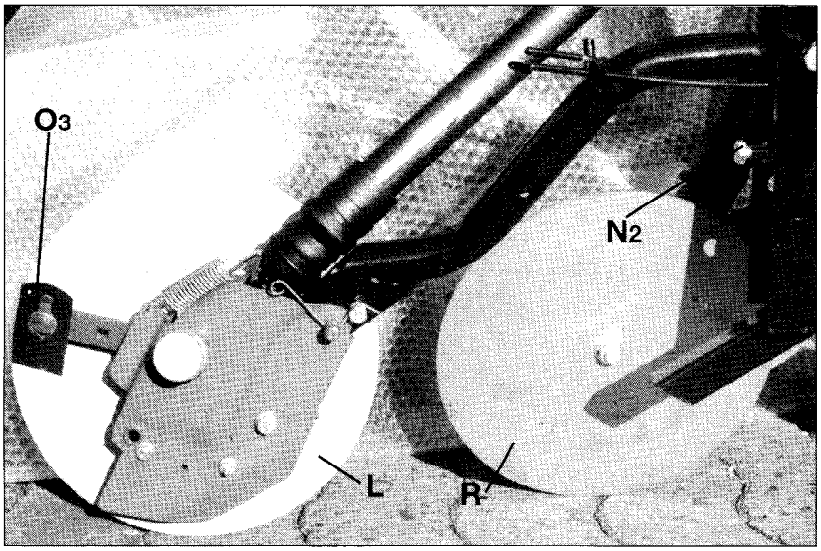


Fig. 42

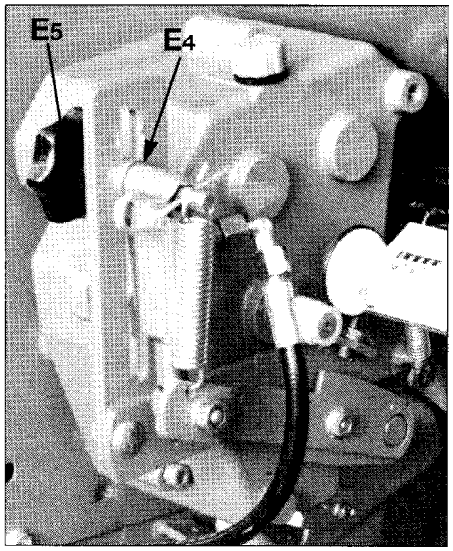


Fig. 43

$$\frac{\text{Working width + row spacing}}{2} = A$$

Wheel marking: measured from the end coulter

$$\frac{\text{Working width + row spacing - track width}}{2} = A1$$

Example: 3 m working width (25 rows) B = 300 cm (no. of rows x row spacing)
12 cm row spacing R = 12 cm
170 cm tractor track width S = 170 cm

$A = \frac{B + R}{2} = \frac{300 + 12}{2}$ 156 cm: measured from outer coulter for centre marking

$A1 = \frac{B + R - S}{2} = \frac{300 + 12 - 170}{2}$ = 71cm: measured from outer coulter for wheel marking

Adjustment of marker ropes (Fig. 34)

To enable the markers to follow the contours of the ground the ropes should be slightly slack in work. Adjust on chains (34 Fig. B2).
A more agessive mark can be achieved by turning the disc axle.
As an overload protection the marker arms are fitted with

shearbolts (34 Fig. B3) M 6x30-8.8.

Note: In operation the hydraulic system of the tractor must stay in LOWER / FLOAT position.

Operate the single-acting spool valve each time the drill is lifted or lowered.
Standard setting of change over mechanism: Refer to maintenance -

Transport (Fig. 35, 36)
Fold-in markers and lock securely (35 Fig. B).
There are two positions to engage the markers. In the outer hole (36 Fig B4) the lid can still be opened
Make sure that the markers are not touching the cab of the tractor.

Coulter pressure (Fig. 37)

The pressure on the coulters and consequently the sowing depth is centrally adjustable with the crank (37 Fig. N) and individually on each coulter (37 Fig. N1).

On tractor mounted MULTIDRILLS both outer coulters are preloaded with higher tension in the wheelmarks. The depth is adjusted by limiter bolts (39 Fig. N2).

Hydaulic coulter pressure(Fig. 38)

To operate is a single acting spool valve required. Pre- set by means of the limiting pins (38 Fig. N 3) a minimum and maximum position.

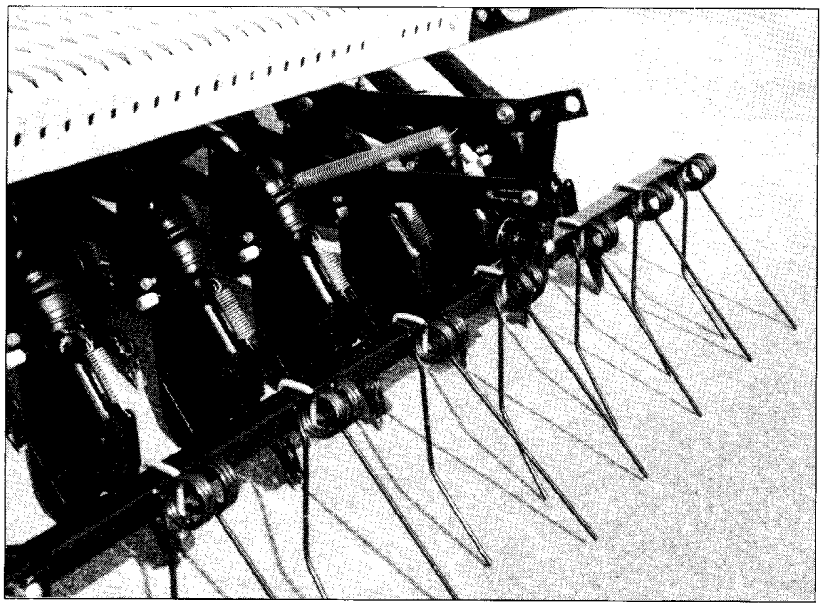


Fig. 44

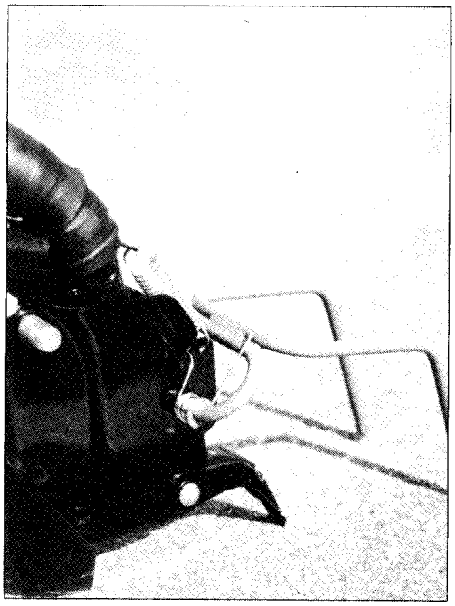


Fig. 45

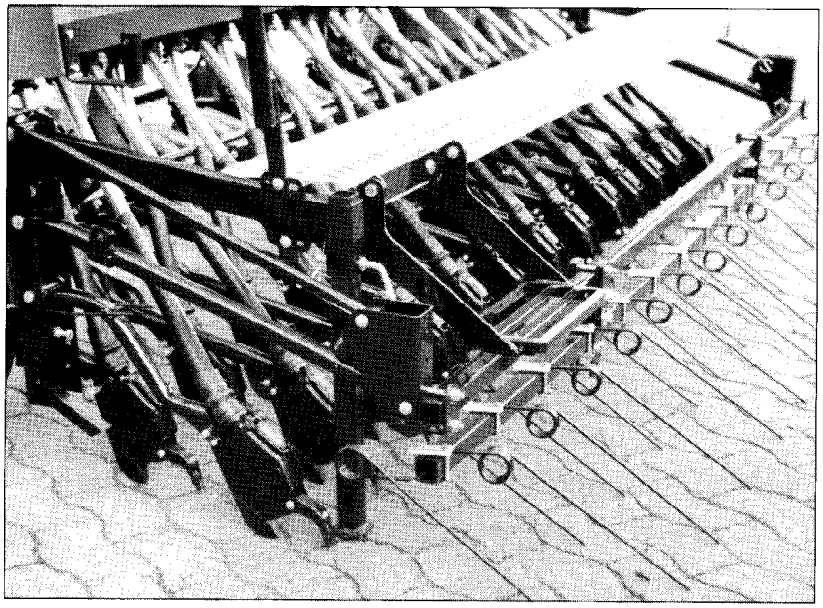


Fig. 46

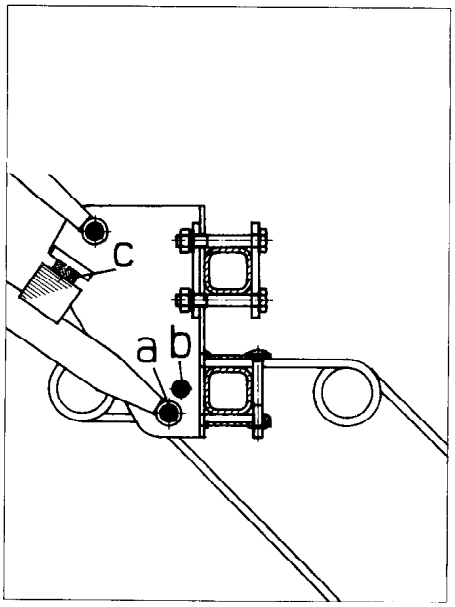


Fig. 47

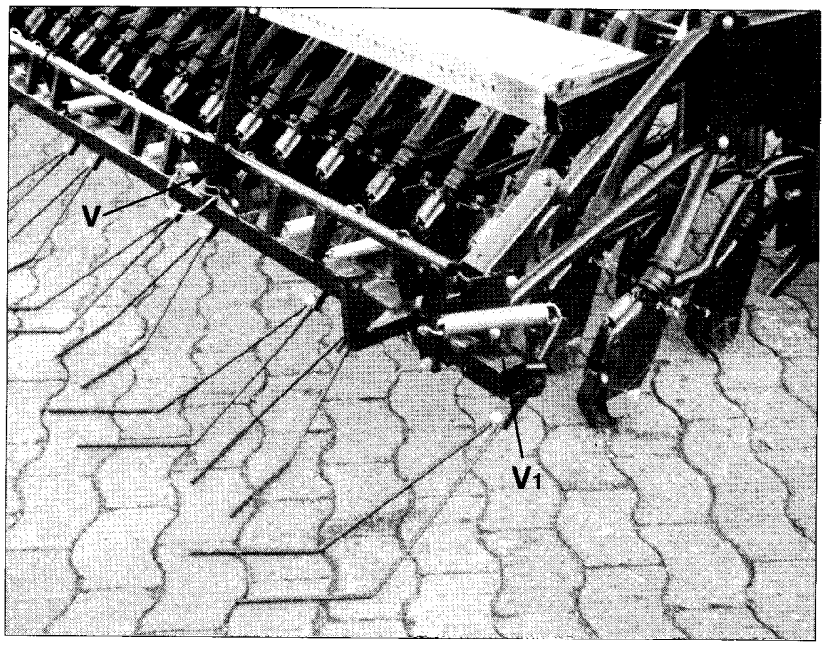


Fig. 48

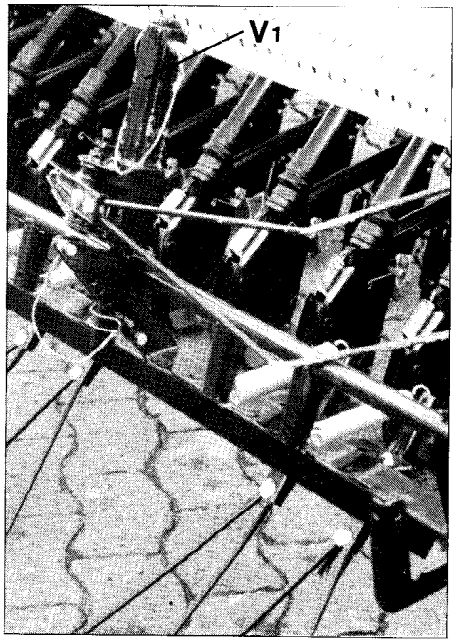


Fig. 49

Hydraulic seed rate setting (Fig. 12, 43)

Standard seed rate: Calibrate the seed rate as described before with plunger on the adj. cylinder of the gearbox moved in. The locking button (12 Fig. E 3) must then be fixed behind the adjustment lever.
Maximum seed rate: Extend adj. cylinder and choose required maximum seed rate by shifting the position (43 Fig. E4) of the cylinder on the slot and fix with button (43 Fig. E 5). Do another calibration test to confirm seed rate.

NOTE: Allow metering lever on the gearbox to move freely.

Exchange of coulters (Fig.39, 40,41, 42)

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

- Universal/ Suffolk coulters (Fig. 39)
  Depth limiters are optional (41 Fig. 04)
- Band seeding coulters (band with approx. 8.5 cm) Fig 40
- Single disc coulters (Fig. 42)

Disconnect the spring (40 Fig. O) and remove the spring engaged pin (40 Fig. O1).

The depth of the disc coulters can be adjusted centrally by the coulter pressure adjustment and by limiters. The illustration shows (42 Fig.N2) the limiter for the outer disc only. Adjust scraper (42 Fig. O3) so that turning of the disc is not hampered.
There are l.h. disc coulters for the front row (42 Fig. L) and r.h. coulters for the rear row (42 Fig. R).

All coulters feature a special hinge like joint in conjunction with an anti-blocking shutter. This prevents seed pipe bending and blocking of coulters every time the drill is lowered onto the ground.

Options of rear harrows (44, 45, 46)

For light and medium soil the COULTER HARROWS (Fig.45) fitted on Universal coulters are recommended for the long seed pipes only.
For more aggressive work (Fig.44) the straight tine harrow is recommended whereas for soils with crop residues the harrow with dragging tines (Fig. 46) are of advantage.

PERFECT rear harrows (Fig. 48) are suitable for all soils and conditions.
Pressure is adjustable by pin holes (48 Fig. V).
3 m models only: To limit the transport width below 300 cm the outer extensions (48 Fig. V 1) can be taken off. There is a safety bar for the transport on roads optional available.

Filling platform (Fig. 46)

Fold - up step during work. Pre- emergance markers can be only fitted when MULTIDRILL is equipped with filling platform.

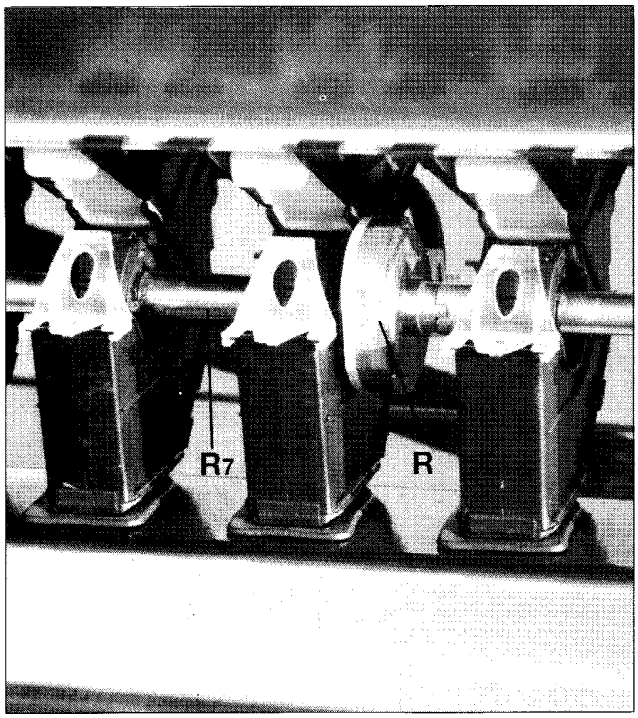


Fig. 50

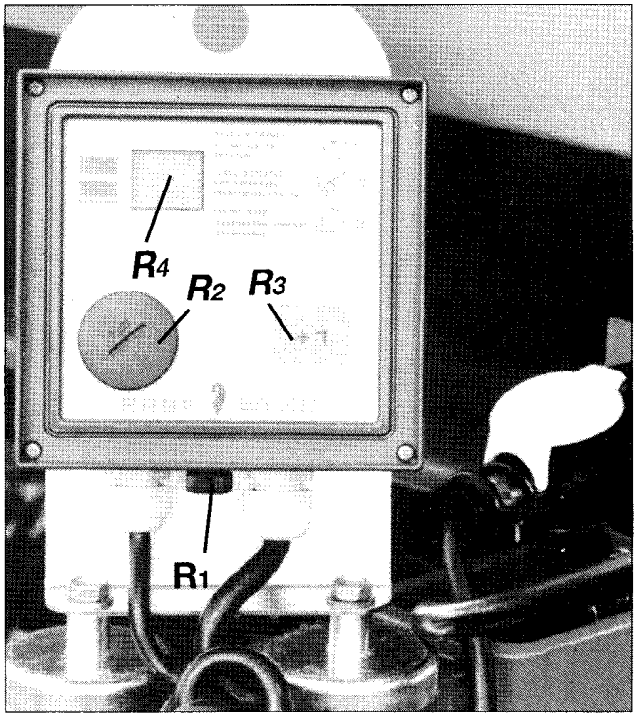


Fig. 51

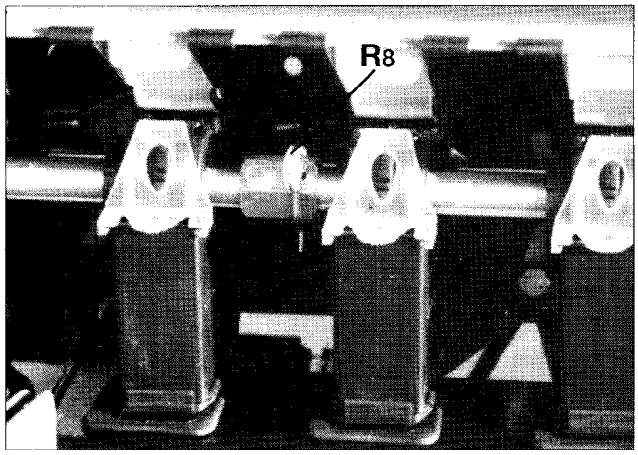


Fig. 52

Pressure adjustment on rear harrows (Fig.47).

This can be increased- or decreased by fixing the bottom arm in position a. or b. and by means of fitting or taking away a nut on the damper (47 Fig. **C**).

Hectare meter (Fig. 57)

As soon as the ground wheel turns the hectare meter starts counting.
Full hectares and hundreds of hectares are indicated. There is also a neutral O-position lever (57 Fig. P).
The hectaremeter is driven by the gearbox. There are several reduction steps on the drive shaft for the different sizes of drills. Make sure that the right sleeve is fitted at the correct position.

Sleeve on counter drive shaft

Model	Tyres	Reduction step / Pt.no:
M 250/ M 300	6.00-16	M 250 M 300
M 300	10.0/75-15.3	9109.95.02
M 400 / M 450	10.0/75-15.3	M 400 M 450 9109.95.03

Track eradicator tines (Fig. 58, 59)

(For solo machines only) Raise tines when the machine is parked.

Electronic tramline control (Fig. 50, 51, 52).

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 2 or 3 rows can be shut-off by means of magnet switches (50 Fig. R) fitted on the metering shaft. They engage or disengage the tramline seed wheels by suppling or cutting off the current supply.
Therefor in case of current failures the seed wheels used for tramlining are always engaged.
If necessary the slide gates can be closed maually for tramlining.
The application of symmetrical tramlines can be chosen in a 3 - 8 times rhythm.

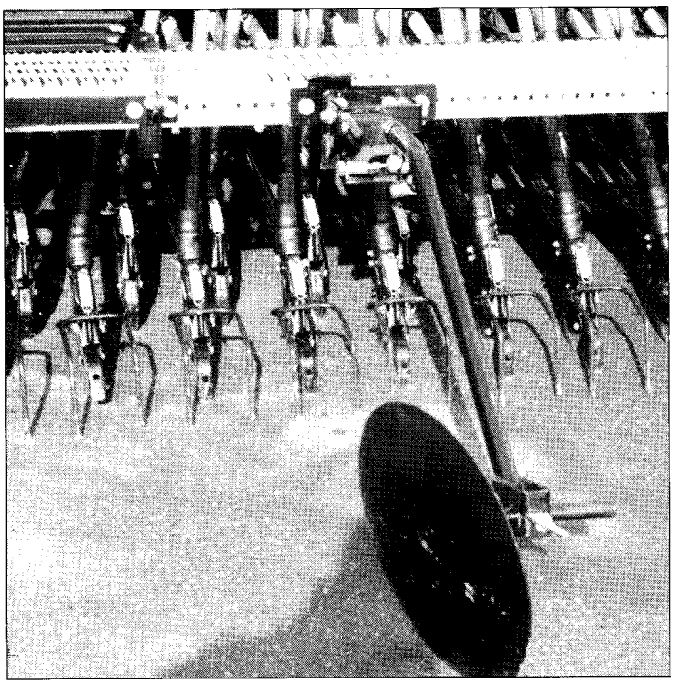


Fig. 53

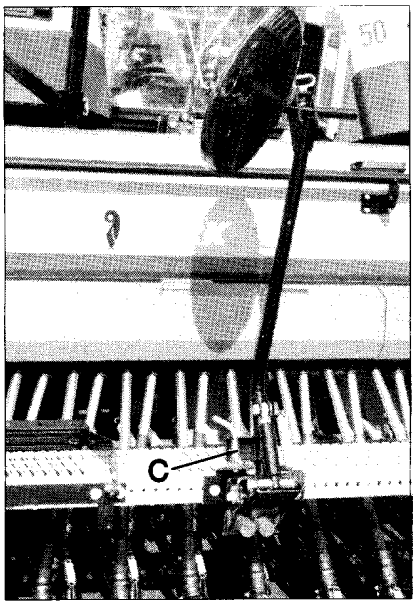


Fig. 54

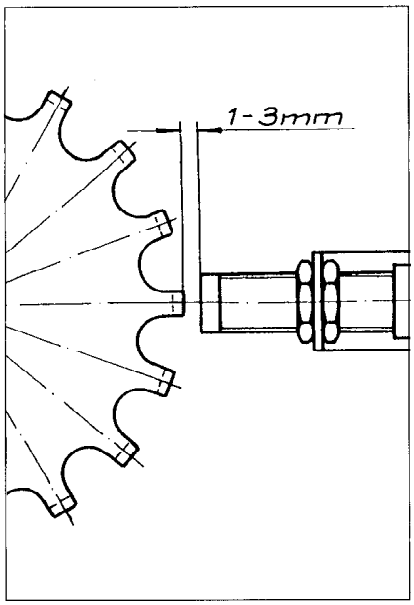


Fig. 55

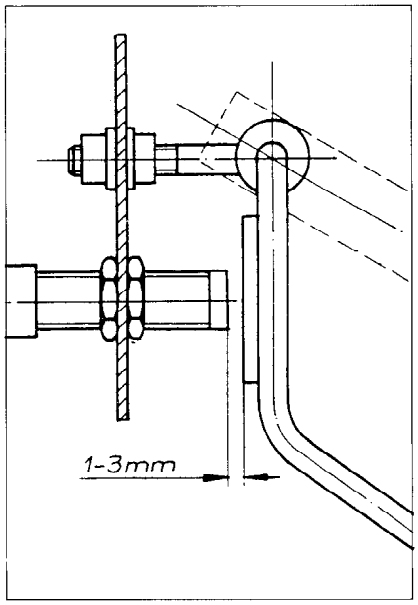


Fig. 56

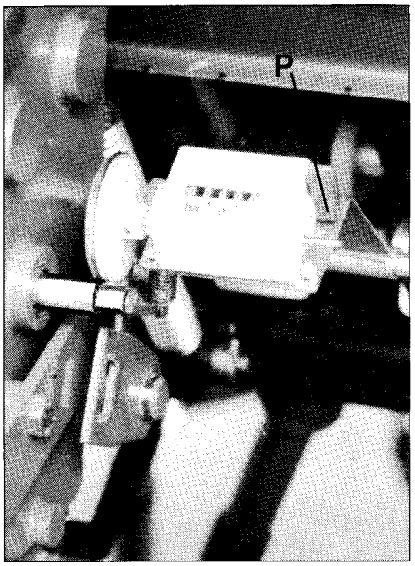


Fig. 57

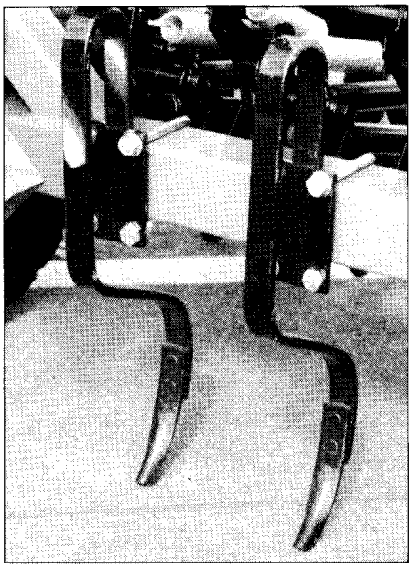


Fig. 58

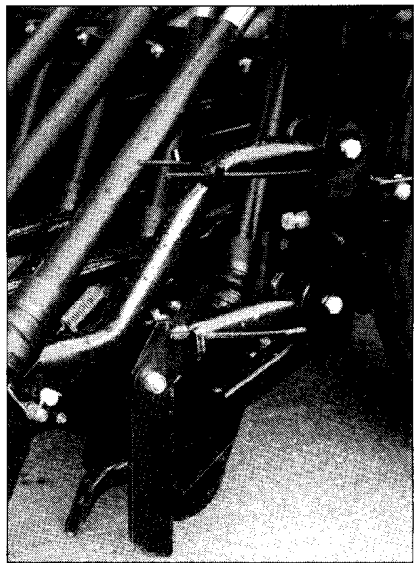


Fig. 59

One sided tramlines (not to be recommended) can only be established in a 4 - 6 or 8 rhythm. Refer to tramline chart on page 30.
It is also possible to select a neutral O-rhythm to be able to work without application of tramlines but to keep the elctronic monitoring of the low level device and metering shaft.

Electronic tramline monitor (Fig.51).

Works with 12 volts from a 7 terminal trailer plug of the tractor. The headlights have to be switched on in dimmed position.
The switch position stays always 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 (51 Fig. R1).
Do not connect the monitor to MULTIDRILL when programming the monitor.

To select tramline rhythm (Fig. 50, 51, 62)

Check before starting that the required tramline rhythm is set on the monitor.
Open plug (51 Fig. R2), press internal push button and hold it.
Every press with the other external button +1 (51 Fig. R3) steps up one sequence and the number will light up at the indicator (51 Fig. R4).
After selecting the rhythm put plug back in place and now set with external button +1 (51 Fig. R3) the sequence for the 1st run at the field end. The figure to select is also stated in the chart in the next column after the tramline rhythm.

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 choosen 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 run (external +1 button only) is set, the 1st run has to be done with half of the seed outlets closed manually by means of closing half of the slide gates.
In case the fertilizer spreader is equipped with l.h. or r.h. shut-off control it can be started with full width and tramlines on the start of the field.
If one sided 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 (62 Fig. T 1).
When tramlining (shut-off rows) the indicator flashes (51 Fig. R4).
Periodically it must be checked that the tramline spacers (50 Fig. R7) fitted on the metering shaft are free moving and not hindered by deposits of the seed dressing.

Pre-emergence tramline markers (Fig. 53, 54)

For pre-emergence spraying the Multidrill can be equipped with an additional set of disc markers at the rear to mark the tramlines during sowing. The change-over is also automatically with an solenoid valve fitted.
Adjust the markers according to the width of the tramlines.
For transport lift the markers out of work and lock with pin (54 Fig. C).
For one sided tramlines (4S, 6S or 8S) one marker arm can be pemanently kept out of work.

Low level and metering shaft sensor (Fig. 55, 56

Both functions can be monitored from the electronic control box.
A light signal and accoustic sound will be given when the metering shaft stops (Fig. 55) but not on headlands. When the hydr. ram for on the marker change- over automat is in extended position (when turning on headlands), the metering shaft control is automatically cut -off.
If the level of seed is dropping (Fig.56) below a certain (adjustable) level a light signal is indicated.
For adjustment of the sensor refer to maintenance.

M A I N T E N A N C E (Fig 42, 50, 60, 61)

Check and retighten all hardware after the first working hours and later periodically.

Grease after every 50 hours in operation all disc bearings of the markers.

Check once a season the oil level in the gearbox (60 Fig. S) with dipstick.
If necessary refill with hydraulic oil HLP 32. The correct capacity is 2.5 liter.

Keep drive chains (61 Fig.) lubricated and under tension (61Fig. S2 + S3).

Keep spacers between seed wheels for tramlining (50 Fig. R7) movable. But do not lubricate metering shaft or seedpipes.

Re-adjust scrapers on disc coulters (42 Fig. O3) if worn.

Incorrect tyre pressure will influence the seed rate badly. It is very important to check the tyre pressure from time to time.

Tyre pressure:	6.00-16	1.2 bar
	10.0/75-15.3	0.8 bar
	31 x 15.50 - 15	0,5 bar

Warning: Never weld on tractor or seeddrill or load battery when the electronic control box is connected.

Calibration of bottom flaps (64 + 14 Fig.)

The correct position of bottom flaps can be checked with an special gauge/ standard supply (64 Fig. H 1) and empty hopper only.
To do so put adj. lever (30 Fig. H) in position 1 and turn the metering shaft so, that the keyway is at the bottom.
Now the special gauge should fit without play between seedwheel and bottom flap measured next to the middle line of pegs. Turn the gauge until the little lever (64 Fig. H 1) can rest on the plastic housing. By releasing bolt (64 Fig. H2) each bottom flap can be re-adjusted. Tighten nuts firmly again.

Basic adjustment of marker switch-over unit (Fig.62)

Swing the markers in working position. Then operate the hydraulic ram until fully extended. Both markers are then in raised position.
The hex nuts (62 Fig. T) on the plunger should be aligned with an 24 spanner to allow one pawl to engage smoothly when the other pawl stays disengaged.

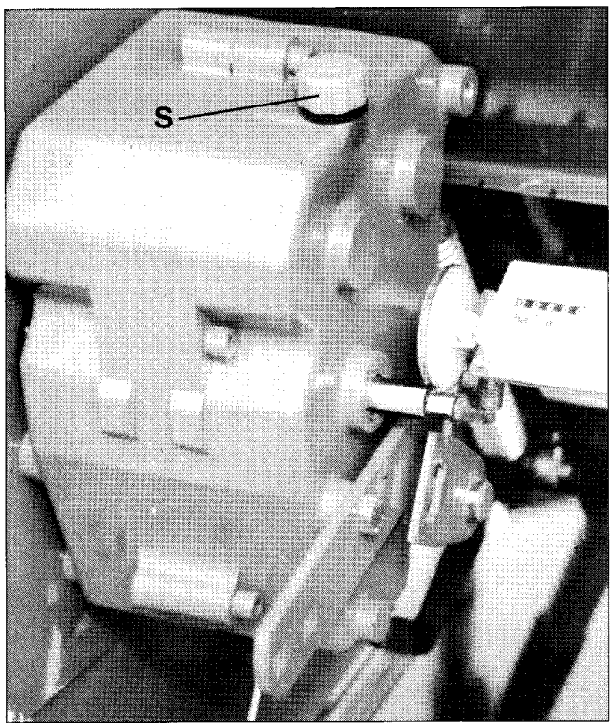


Fig. 60

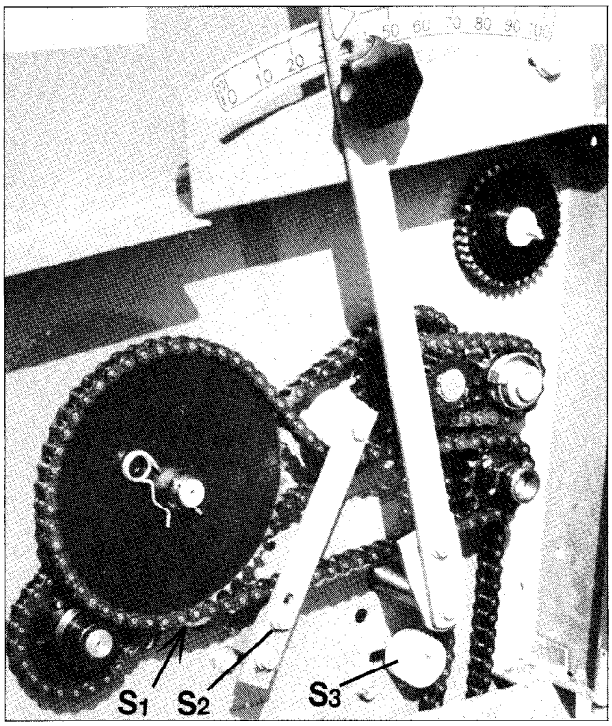


Fig. 61

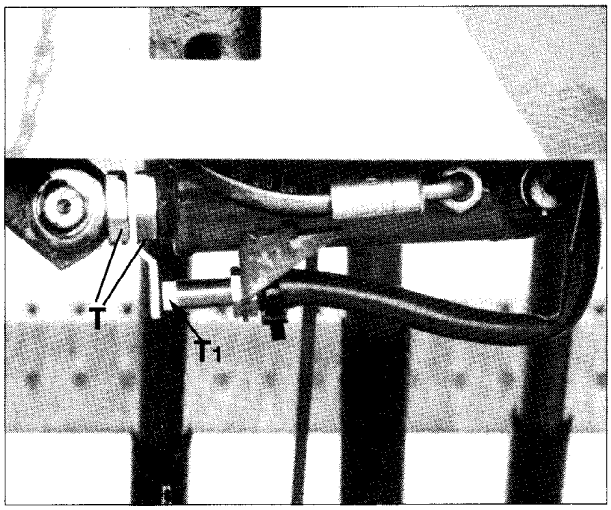


Fig. 62

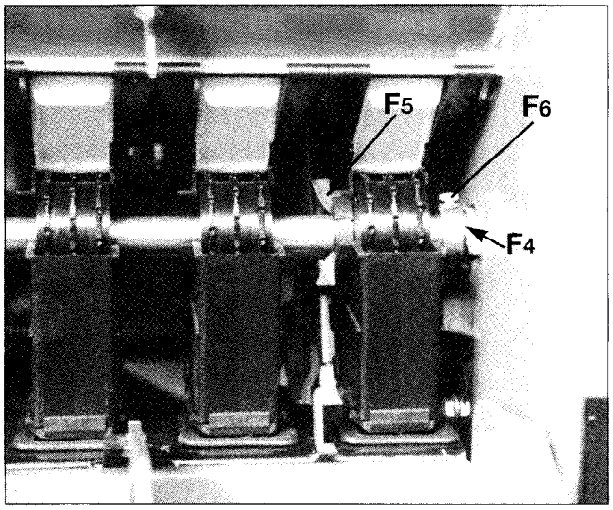


Fig. 63

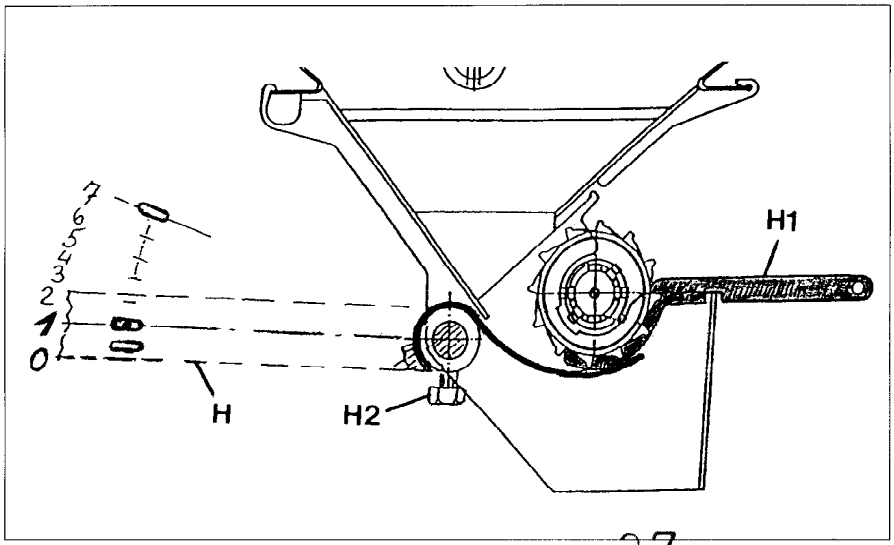


Fig. 64

Basic adjustment of sensors (Fig. 55, 56, 62)

The inductive sensors are adjusted with a gap of 1 - 3 mm (62 Fig. T1). There is a built-in function control by means of a light diode, which shows if the sensor is working.

Removal of metering shaft (Fig. 14, 26, 63)

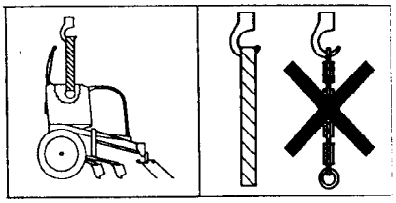
Remove clamps (26 Fig. F1) and fine seed fingers(26 Fig. F) if fitted. Also open slidegates (14 Fig. G) fully and release collar (63 Fig. F 6).
Turn the metering shaft until the clutch (63 Fig. F4) is positioned with the lug showing rearwards as illustrated.
Disengage all plastic bearings (63 Fig. F5) by pressing them inwards to release lock and turning clockwise by 90°. The shaft is then free to be lifted out backwards.
The refitment takes place in reverse order.

Transport (Fig 28)

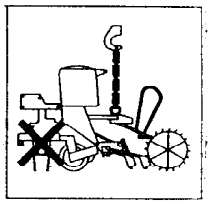
Lifting by crane:

Warning:
Only with empty hopper and never with rotary harrow or any implement attached!
Use straps for lifting. **Make sure that they do not collide with hopper. Otherwise the hopper can be seriously demaged.**

For all tractor mounted (Solo) machines straps can be fixed through the central divider plate (28 Fig. M1).

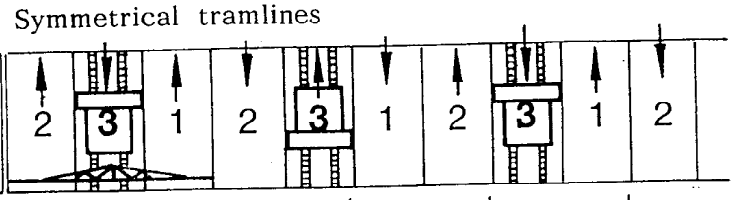
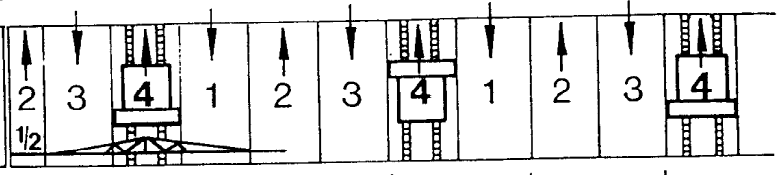
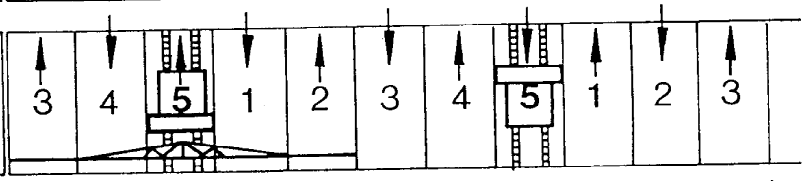
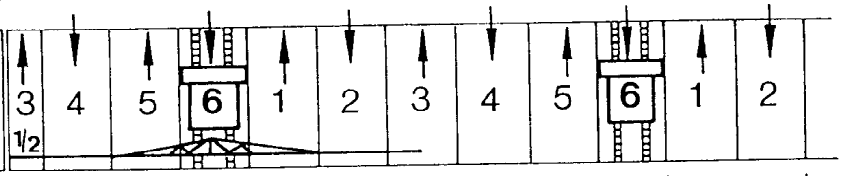
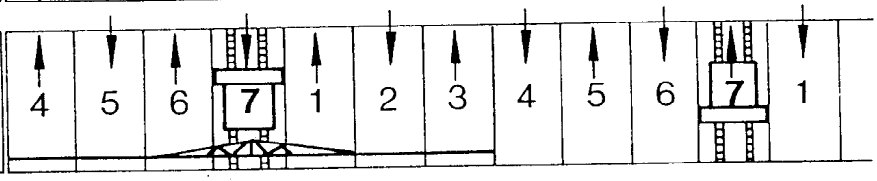
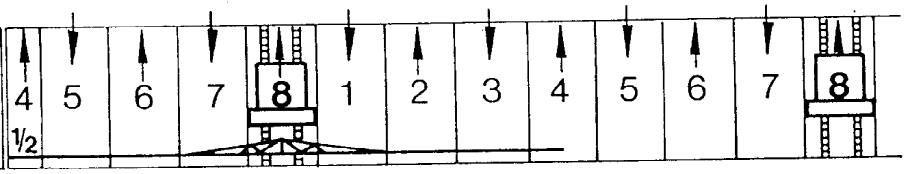


For all rotary harrow mounted drills there is a special lifting hook at the centre of the machine behind the marker change-over unit provided.

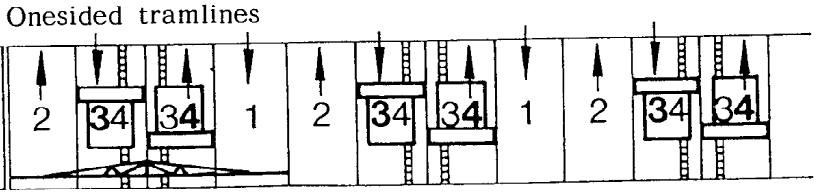
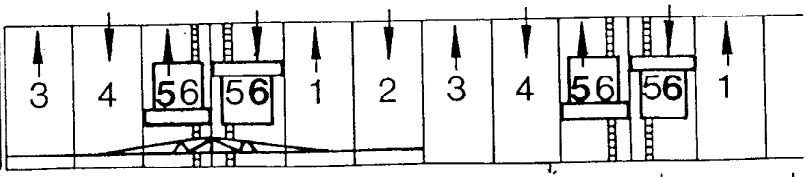
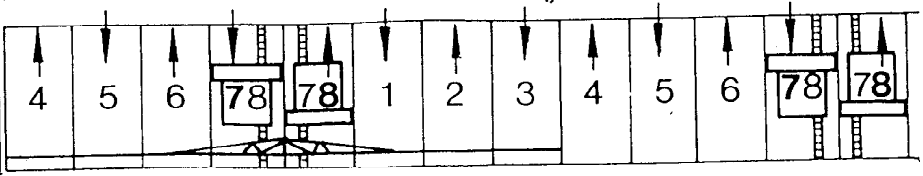


Work. width Seeddrill	Spraying Fertilizing	Rhythm	Examples for tramlines

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	

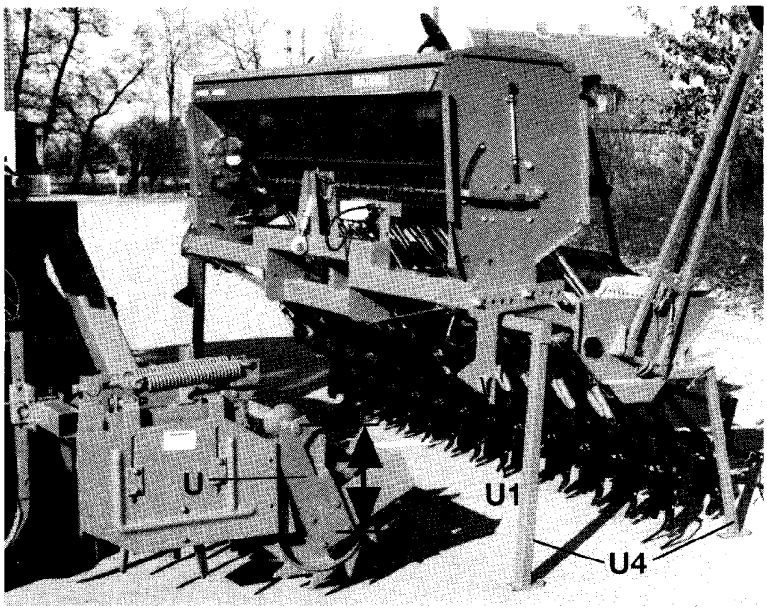


Fig. 1

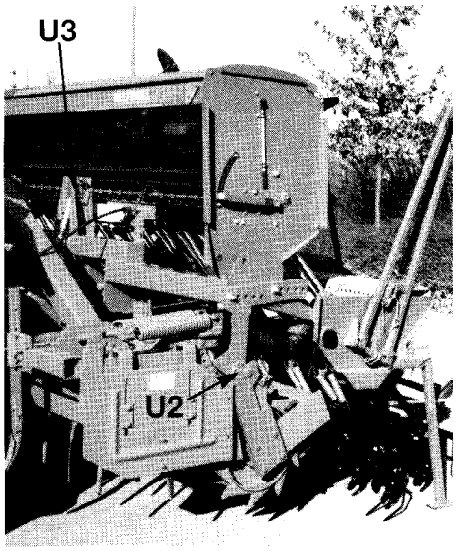


Fig. 2

The implement on which the seeddrill will be mounted must be suitable for fitment.
The implement should be rigid and stabil enough to carry the seeddrill safely.
E. g. for mounting on any RABE rotorharrow with 2,5 or 3,0 m working width (except HKE) an extra set of support struts is required for the headstock of the rotary harrow.
One of the features of the MULTIDRILL is that the drill is mounted on the rear packer roller. Therefore the rear roller must also be strong and suitable enough to carry the drill.

Mounting (Fig 1)

Fit the supplied mounting parts on the rear packerroller of the implement (1 Fig.U).
The centre of the hitch pin and the centre of the RABE GZW toothed packer roller should be apprx. 360 mm apart (1 Fig. U).
Fit the mounting parts for the drill (1 Fig. U 1) so that the drill stays in mounted position as closed as possible to the rear roller.
The MULTIDRILL A which must be parked empty on the parking stands can now be connected to the implement by backing up with the tractor on which the implement is fitted.
Fit the pin (2 Fig. U2) and secure with lynch pin.
Lift the implement and remove the front stands (1 Fig. U1).Then lower the unit a little and fit the top link (2 Fig. U 3). Lift the implement again to remove the rear stands.
The stands can remain in the same brackets but fixed up side down. Only for the rear rh. stand is a special holder (3 Fig. U5) provided.

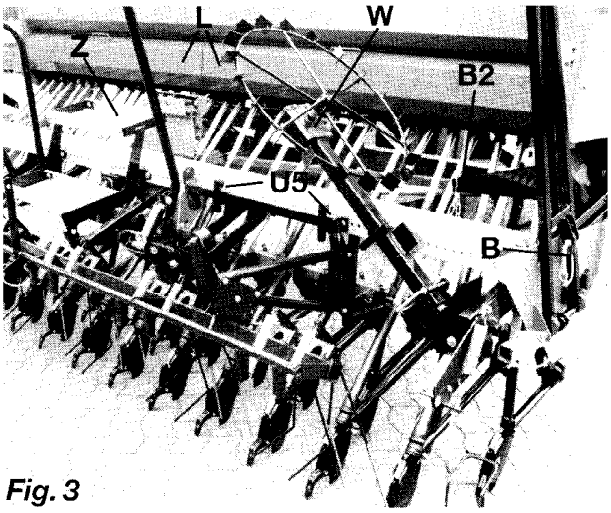


Fig. 3

To fit the hydraulic couplings and the electronic tramlining system refer to the general operating instructions in this manual.

Adjustment of toplink

Adjust the length so that in work the top of the drill is horizontally and vertically level.

Disconnecting or parking (Fig 1)

Disconnecting of seeddrill should take place in reversed following order as described above. The hopper must be emptied before this takes place.
Make sure that the parking stands (1 Fig. U 1& 4) are secured by the locking pins and the machine is standing on firm and level ground.

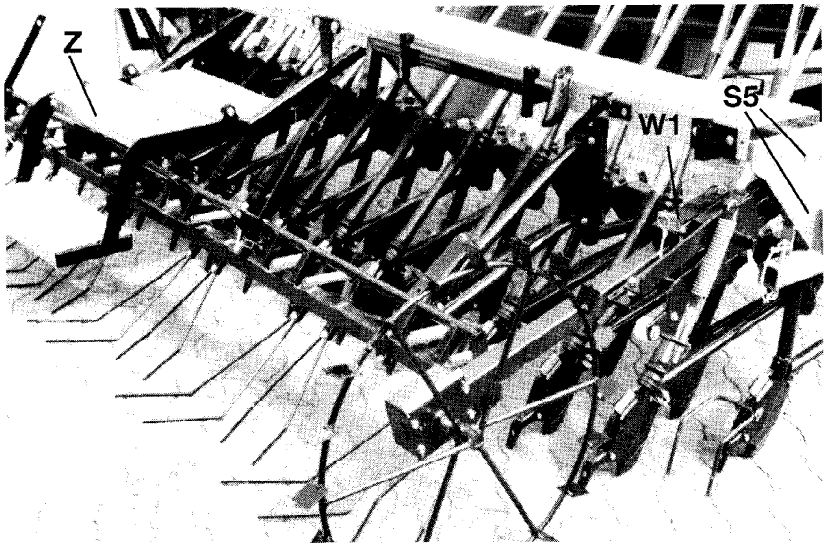


Fig. 4

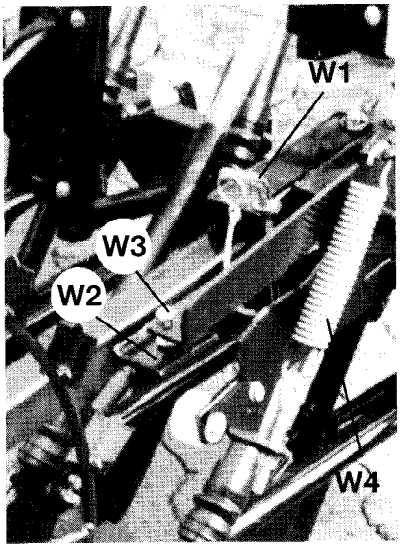


Fig. 5

Transport (Fig. 3, 5, 9)

Close lid on hopper and make sure that the calibration trays are fully engaged in the out of work position (3 Fig. L).
Fold in rear footstep (3 Fig. Z) and disengage the groundwheel by removing pin (5 Fig. W 1) to fold up wheel (3 Fig. W) for transport.
If pre-emergence markers are fitted they must be lifted out of work and depending to national safety rules the discs must be taken off.
Transport with empty hopper only!
The rear harrow can be folded upwards by 180 ° (8 Fig X 2) and fixed (9 Fig.V2). Rearlights have to be fitted if required by national safety rules.

Calibration and operation

Read relevant pages as described before in manual.

To change turning direction of metering shaft (Fig 6 & 7)

Standard (lower) discharge system:
Collar fitted (6 Fig. E)

Upper discharge system:
Sprocket fitted (7 Fig. E 1) with spacer fixed behind.

Agitator shaft (Fig. 7)

Remove lynch pin (7Fig. E2) to disengage.

Seedrate adjustment (Fig. 6)

Infinitely adjustable on gearbox by lever (6 Fig. E 3) from 0 - 100.
Optional available is an hydraulic device to enable the operator from the tractor seat to increase the seedrate on the move according to a pre-set rate.

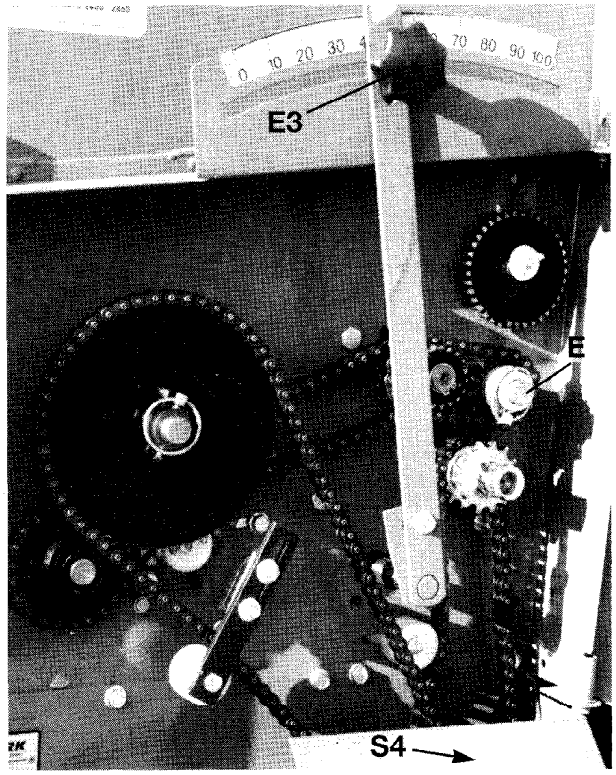


Fig. 6

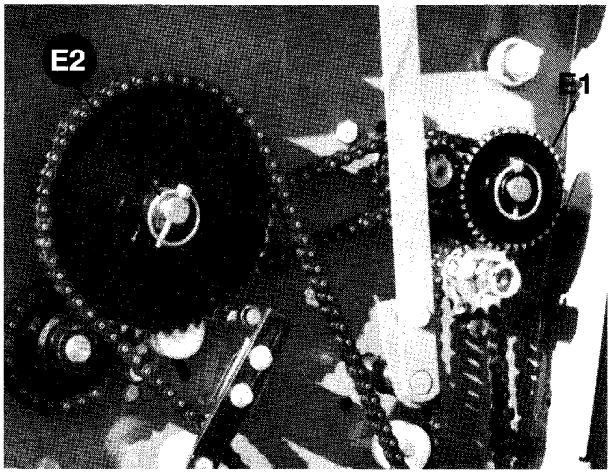


Fig. 7

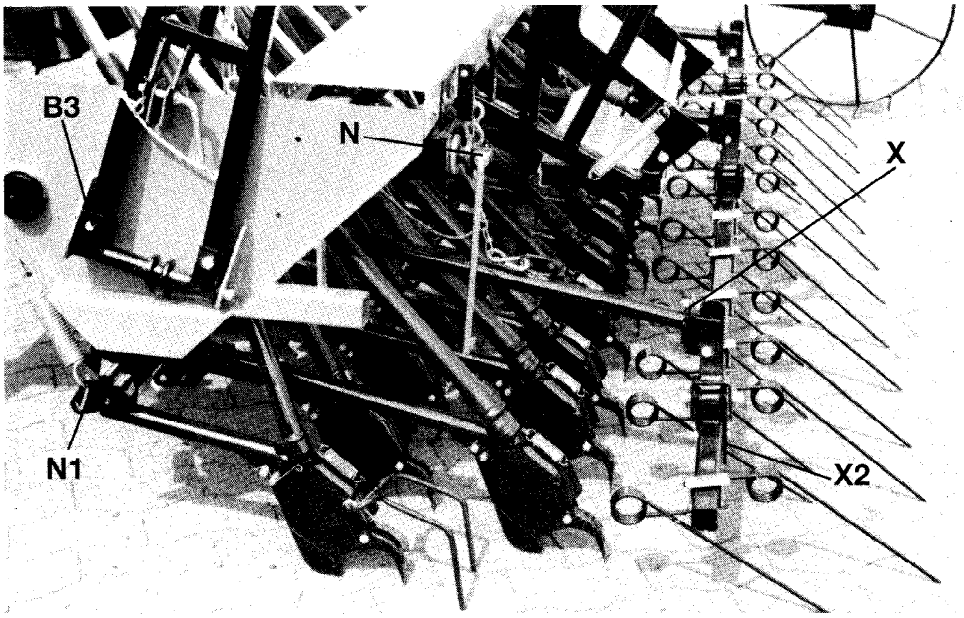


Fig. 8

Fig. 9

No. of crank turns for calibration

Work. width	1/40 ha	1/10 ha
2,5 m	93	372
3,0 m	77,5	310
4,0 m	58	232

Metering wheel (Fig. 4)
Engage in work with pin (4 Fig. W1). There is an limiter bolt provided (5 Fig. W3) to adjust the depth to allow the wheel to follow the contours of the ground.
The ground pressure is adjustable by spring tension (5 Fig. W4).

Coulter pressure adjustment (Fig. 8)

Infinitaly manually adjustable by crank handle (8 Fig. N), individually by means of changing position of spring (8 Fig. N 1) or optional hydraulically with pre-set settings for NORMAL or MAXIMUM pressure.

Rear harrow (Fig. 8)

The degree of tine angle is adjustable by means of adjusting limiter bolts (8 Fig. X)
The depth penetration is limited by adjusting the length of the chain.
For transport the chain can be shortened to lift harrow higher up.

Perfect harrow (Fig. 10)

Each single element is springloaded and is centrally adjustable by means of pin hole adjustment (10 Fig. V). The bottom harrow arm must be kept in position (9 Fig. V3)
The total width can be shortened to 3 m on l.h. side by moving outer section (10 Fig. V 1) inwards.

Fig. 10

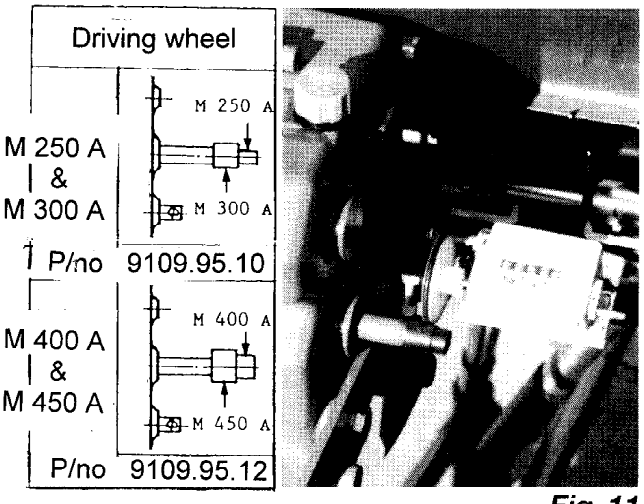


Fig. 11

Drive for hectare meter (Fig. 11)

The different models are equipped with different driving wheels.
Make sure that this wheel is fitted at the right position. Refer to the following chart.

Marker arm setting (Fig. 3, 8, 12)

The markers are adjustable to the tractor center.
Exeption of 2,5 m drill which is wheel marking.
Adjust length of rope (3 Fig. B 2).
There is a shearbolt provided M 8 x 60-8.8 to avoid demage to the marker arm (8 Fig. B 3).
The spoolvalve position to control the markers should stay always in FLOATING position.

Rear footstep (Fig. 4)

During operation or in transport always lift up (4 Fig. Z) out of work

Shut- off half working width

On M 400 A models only the left half of the the metering shaft can be disconnected by removing in the middle a locking pin to enable the operator to start drilling on the one side of the field with only half the width working.

Maintenance

Lubricate all universals and joints as well as marker change-over devic and the chain drive and free- wheel assembly behind cover (6 Fig. S 4). Also crown wheel drive on ground wheel. But not sowing shaft or seed pipes.
Grease daily discs on markers.
Retention chain drive by adjusting tensioner blocks when necessary.
The groundwheel drive can be retensioned by loosening bolts bolts (4 Fig S 5) and shifting both sections further apart.

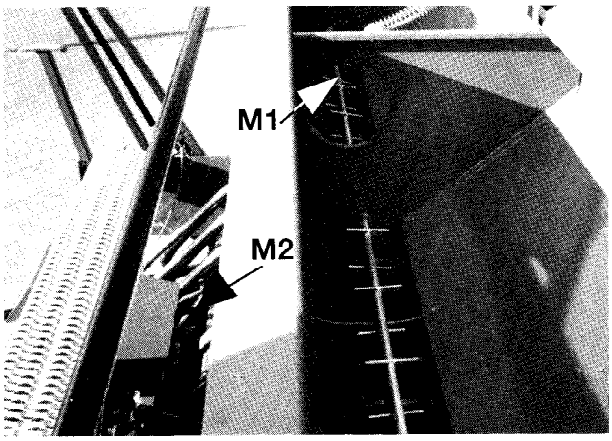
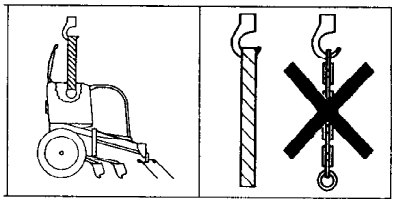
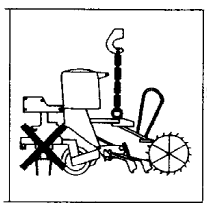


Fig. 12

Lifting MULTIDRILL A by crane

The seeddrill under all curcumstances must be seperated from the rotary harrow or any other implement where it is mounted on and must be empty.
Use suitable lifting gear such as straps for hook provided (12 Fig. M2) to avoid demage!
Solo machine through devider plate (12 Fig. M 1).





RABE WERK
GmbH+Co. D-49152 Bad Essen
Telefon (05472) 7710-Telex 941617-Telefax (05472) 771190

No. 126-2-95 GB