Order-No. 9198.02.01GB

Operating Instructions
Calibration charts

Seed drills
Turbodrill L ... A
Turbodrill XL ... A

For Your Own Safety

In this enclosure to the operating instructions you will find some general rules of conduct explaining how to operate the implement correctly - and some safety advice which we advise you to observe for your own safety!
The list is very extensive, and some of the advice does not specifically relate to the implement supplied. However, the summary of advice is to remind you of safety guidelines which are often unconsciously ignored when operating the machines and implements on a daily basis.

1. Authorized Use

The implement has been specifically built to perform standard operations pertaining to agricultural work (authorized use).

Any type of usage outside of these parameters is deemed to be improper usage. The manufacturer accepts no responsibility for damage resulting from such usage, and the risks are to be borne solely by the user.

Within the bounds of authorized usage it is also necessary to adhere to the manufacturer's prescribed operational, maintenance and service conditions.

The implement may only be used, maintained or serviced by people who are familiar with such an implement and aware of the risks involved. Please also ensure that all safety instructions are passed on to other users.

It is important that any and all relevant accident prevention regulations and any other generally recognized safety, industrial hygiene and road traffic regulations be observed.

Modifications to the implement made by the user will void any liability on the part of the manufacturer for any resulting damage.

2. General Safety Advice and Accident Prevention Regulations

- Before starting up your implement and tractor, please check that it is roadworthy and operatively safe.
- Please observe all generally valid safety and accident prevention regulations.
- The warnings and signs found on the implement are there to provide essential data needed to operate the unit safely. Please observe these for your own safety.
- When using public roads always follow the relevant traffic regulations.
- Before commencing work, ensure that you are familiar with all devices and operating controls as well as with the functions these perform. It is too late to do so once the implement is in operation!
- Operators should wear tight-fitting clothing. Try to avoid wearing loose clothing wherever possible!
- The machine should be kept clean to prevent the risk of fire!
- Check the immediate surroundings before driving off and putting the machine into operation! (Beware of children!) Ensure that you have sufficient visibility!
- Riding on the equipment during work or transportation is not allowed!
- Implements should be correctly coupled and only secured to the specified appliances.
- Special care is to be taken when coupling and uncoupling implements to or from the tractor.
- When coupling and uncoupling supports, always position them correctly. (Stability)
- Always ensure that weights are only added correctly to the specified mounting points.
- Observe all permissible axle loads, total weights and transportation dimensions.
- Check and mount transportation equipment such as lighting, warning devices, and guards, if necessary.
- Ensure that the release ropes used for rapid coupling and uncoupling hang loose and do not automatically release when in a low position.
- Never leave the operating platform when in transit.

- Road, steering and braking performance will be influenced by mounted or attached implements and ballast. Therefore make sure that you have sufficient steering and brake capability.

- Account for the width of the implement and its working load when taking corners.

- Only operate implements once all the safety devices/guards have been mounted and are in protection mode.

- Keep clear of working areas at all times.

- Keep clear of rotating and swinging parts on the implement.

- Ensure the swinging parts are clear of bystanders before operating any hydraulic folding frames.

- Power-steered parts (e.g. hydraulics) can cause crushing or amputation!

- On high-speed implements with ground-driven implements beware of after-running swinging parts! Only approach once the implement is at a complete standstill!

- Before leaving the tractor, lower the implement to the ground, switch off the engine and remove the ignition key!

- Do not allow anyone to stand between the tractor and the implement without first having secured the vehicle against running away by putting on the handbrake and/or using wheel chocks.

- Ensure that the folded-in frames and lifting equipment are securely in transportation position.

- Fold in and lock the packer catching arms before transporting on roads.

- Lock the marker arms to transportation position.

2.1 Coupled Implements

- Before coupling or uncoupling an implement to the three-point linkage, position the operating device in such a way as to prevent unintentional lifting or lowering.

- When using the three-point linkage it is vital that the coupling configurations of the tractor and implement correspond or are co-ordinated.

- There is a risk of injury through crushing or amputation near the three-point linkage.

- When using the external controls to operate the three-point linkage, keep clear of the area between the tractor and the implement.

- When the implement is in transportation position, always ensure that the tractor's three-point linkage is sufficiently locked at the side.

- When transporting a raised implement on public roads ensure the control lever is locked in place to prevent accidental lowering.

2.2 Mounted Implements

- Secure the implement to prevent it from running away.

- Observe the max. permissible bearing loads for the trailer coupling, swinging drawbar or hitch.

- If a drawbar trailer is used, ensure that there is sufficient manoeuvrability at the towing point.

2.3 PTO Drive (applies only to PTO-driven implements)

- Only use the drive shafts specified by the manufacturer.

- A pipe shield and protective bell must be mounted on the drive shaft as well as a PTO guard – also possible on the implement - and must be in perfect working order.

- Ensure the specified pipe covers are used on the drive shafts when in transportation and working position.

- Only couple and uncouple the drive shaft once the PTO has been disengaged, the engine switched off and the ignition key removed.

- Ensure that the drive shaft is mounted and secured correctly at all times.

- Secure the drive shaft guard by locking the chains in place to prevent them from turning.

- Before engaging the PTO make sure that the PTO speed chosen on the tractor complies with the permissible speed of the implement.

- When using ground speed power take-off ensure that the speed is regulated by the travel speed and that the direction of rotation changes when reversing.

- Before engaging the PTO make sure that the area of danger around the implement is free of bystanders.

- Never engage the PTO when the engine is switched off.

- When working with the PTO, keep the area around the rotating PTO and drive shaft clear of any bystanders.

- Always disengage the PTO where the bends are too big and it is not needed.

- Caution! Beware of after-running gyrating loads after disengaging the PTO! Do not stand too close to the implement during this time. Only begin working on it once it has come to a complete standstill. It is essential that you switch off the engine and remove the ignition key.

- Before cleaning, greasing or adjusting a PTO-driven implement or its drive shaft, always disengage the PTO, switch off the engine and remove the ignition key.

- Place the uncoupled drive shaft on the specified support.

- Cover the stump of the PTO with a protective cover after dismounting the drive shaft.

- Any damage which may arise should be repaired immediately. Never work with a damaged implement.

2.4 Hydraulic Equipment

- Hydraulic equipment is under very high pressure.

- When connecting hydraulic cylinders and motors ensure that the hydraulic hoses are connected as specified.

- When connecting hydraulic hoses to the tractor's hydraulics ensure that the hydraulics are depressurized on the tractor and the implement.

- Where it is necessary to connect hydraulic functions between the tractor and the implement, the coupling sockets and plugs should be marked to prevent faulty operation.
  Mixing up the connections will reverse the functions (e.g. lift/lower) - **Risk of injury**!

- Check the hydraulic hose connections at regular intervals and replace if damaged or aged. The replacement hydraulic hoses must comply with the technical requirements stipulated by the implement manufacturer.

- When looking for leaks, use suitable aids and resources to prevent injury.

- Liquids that leak at high pressure (hydraulic oil) can penetrate the skin and cause serious injury! In the event of injury, consult a doctor immediately. Risk of infection!

- Before working on hydraulic units, lower the implement, depressurize the system, switch off the engine and remove the ignition key.

2.5 Brakes and Tyres

- Check that the brakes are functional before every journey.

- Thorough checks are to be performed on the brake systems at regular intervals.

- Adjustments or repairs to the brake system may only be performed by qualified staff or recognized brake service centres. Only use the prescribed brake fluid and replace as specified.

- When working on the tyres please ensure that the implement has been securely parked and cannot run away (wheel chocks).

- Fitting tyres requires having sufficient training and the correct fitting tools.

- Wheel and tyre repairs may only be performed by qualified staff using the correct fitting tools.

- Check the air pressure at regular intervals observing the prescribed air pressures given.

2.6 Maintenance

- Service, maintenance and cleaning work as well as the elimination of malfunctions should only be carried out once the drive unit has been switched off and the engine has come to a standstill. Remove the ignition key.

- Check that the nuts and bolts are snug, and tighten as necessary.

- When carrying out maintenance work on a raised implement always secure using suitable support elements.

- When replacing bladed working tools use the appropriate tools and gloves.

- Dispose of all oils, grease and filters in a due and proper manner.

- Always disconnect the power supply before working on electrical equipment.

- When performing electrical welding work on a tractor with a mounted implement disconnect any cables connected to the generator and the battery.

- Gas tanks must only be filled using nitrogen to avoid risk of explosion.!

- Spare parts must at a minimum comply with the technical requirements given by the manufacturer of the implement. We therefore recommend that for your own safety you **use original parts only**!

2.7 Additional Hints and Tips: Mechanical Seed Drills

- Danger! Beware of rotating and oscillating machine parts when performing a calibration test.

- Only use the tread plates for filling purposes. Riding on the machine during operation is prohibited.

- When transporting on public roads protect or remove the thrust collars on the pre-emergence marking.

- When filling the seed hopper, observe the information provided by the implement manufacturer.

- Lock row markers in transportation position.

- Do not place any foreign parts in the seed hopper – the agitating shaft also rotates during manoeuvring.

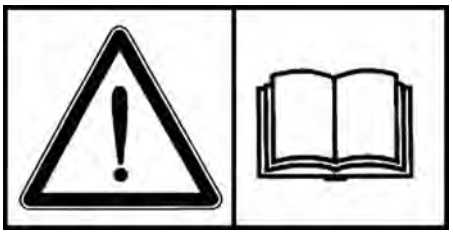
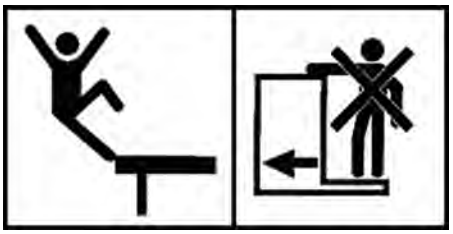
- Observe the permissible filling quantities.

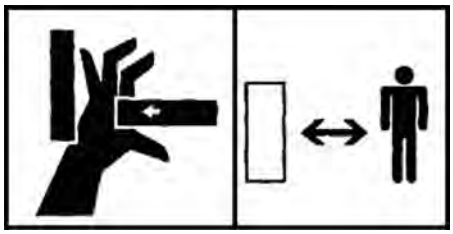
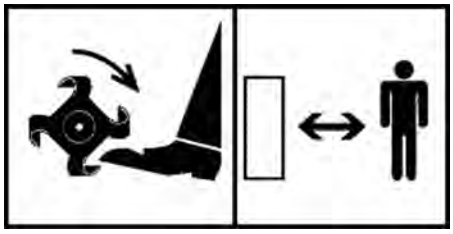
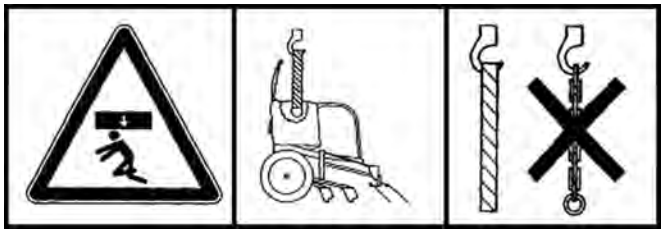
Key to warning labels (pictograms)

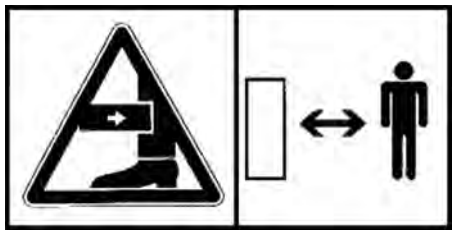
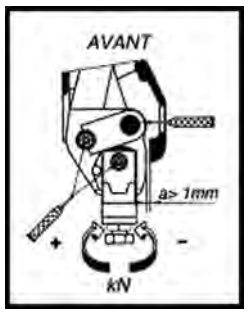
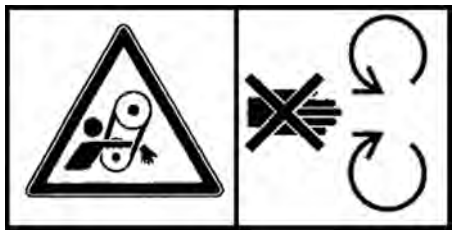
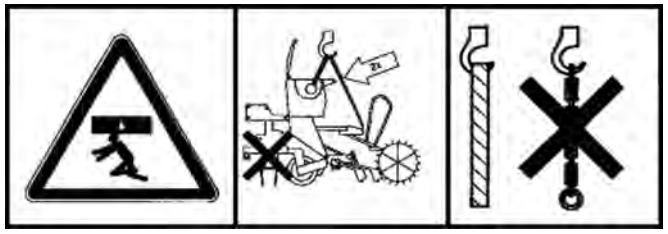
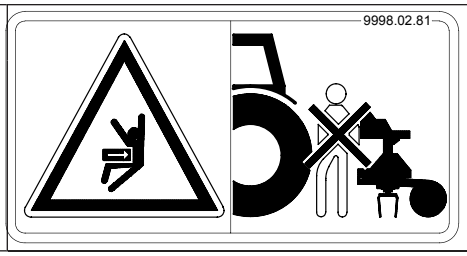
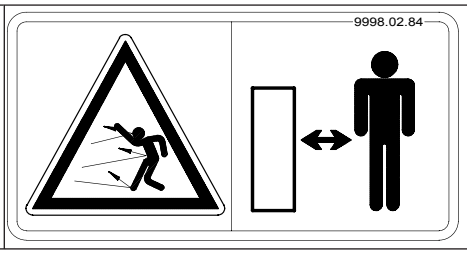
Warning labels are used to indicate possible danger areas; they provide information on how to operate the implement safely.
The pictograms are an integral part of the implement.
Warning labels should be visible (dirt-free) at all times, and replaced if damaged – they can be ordered from Rabe under the relevant pictogram number (Pict. No.).

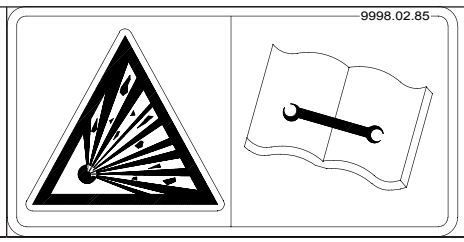
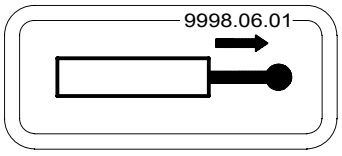
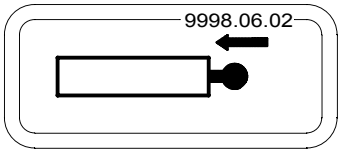
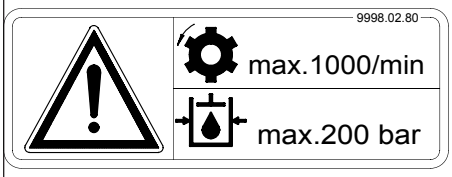
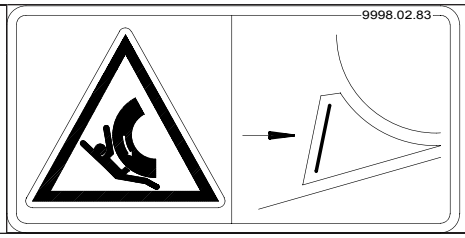
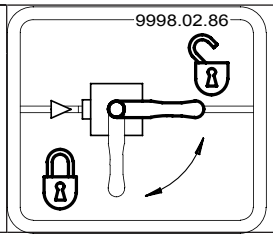
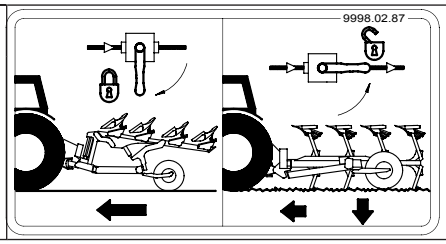
Pict. No.

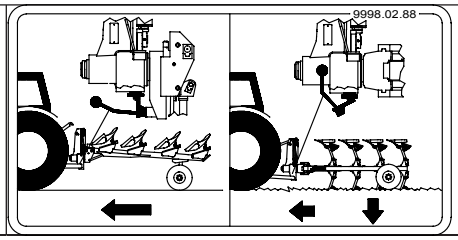
Position-No.

1 9998.02.59		Read operators instruction book before operation and ensure you understand the safety advices and the informations containes in it.
2 9998.02.73		Retighten all screws and bolts after the initial hours of work, and check regularly for tightness thereafter. For torque settings refer to manual or parts list. Use torque limiting spanner.
3 9998.02.56		Never allow people to stand or sit on the machine during work or in transport. Enter filling platform only when the machine is not in motion.
4 9998.02.53		Folding wings. Keep away! Keep clear and do not enter danger area. When extending take care of sufficient space.
5 9998.02.52		Plough may turn or swing in. Keep away. Do not enter danger area.

6 9998.02.61		Danger of squeezing. Keep away!
7 9998.02.55		Rotating tools. Keep away! Do not grasp behind safety devices or covers. Never carry out work unless PTO-drive is disengaged and the engine is stopped.
8 9998.02.57		Danger of Life by load from top! Lift Turbodrill only with empty hopper and never together with rotary harrow. Use safe lifting gear and fit straps only on hooks provided.
9 9998.02.12		Danger of Life by load from top! For lifting seed drills use only straps. No chains. Fit straps on divider plate inside the hopper.
10 9998.02.11		Danger of Life by load from top! Lift with empty hopper only and never with rotary harrow or any other implement attached. Use safe lifting gear and fit straps only on hooks provided.
11 9998.02.63		Use suitable and safe lifting gear and fasten here. Keep a safe distance from the machine beeing lifted.

12 9998.02.60		Danger of leg injuries when elements may suddenly swing out. Keep away!
13 9998.02.58		Grease all marked grease nipples regulary. The reset force can be increased by adjusting the bolt (kN) to the left (!). Reduce by turning to the right. There must be always a minimum clearance a of 1 mm. Caution! Spring is pre-loaded.Do not dismantle or remove spring system without the use of special tools and without being familiar with the dismantling instructions provided by the manufacturer. Danger of Life!
14 9998.02.64		Never open or remove any safety guards when the unit is running. Keep away!
15 9998.02.10		Danger of Life by load from top! Lift with empty hopper only and never with rotary harrow or any other implement attached. Fit straps on divider plate inside the hopper and only on hooks provided. Use no chains.
16 9998.02.81		Risk of crushing in and around the tractor and the implement! When coupling the implement combination to the tractor, ensure that no one is standing within the operating areas of the tractor or implement! Do not step between the tractor and implement to operate the external three-point hydraulic controls.
17 9998.02.84		Caution! Hurling foreign objects! Keep danger areas clear of people!

18 9998.02.85		Hydraulic accumulator is pressurized. Repair and replace only as prescribed in the Technical Manual provided.
19 9998.06.01		Oil flow path: Forward: ”Lift”
20 9998.06.02		Oil flow path: Return ”Lower” or ””Tank”
21 9998.02.80		The maximum operating pressure for the hydraulic system must not exceed 200 bar! The maximum rotational frequency of the PTO shaft must not exceed 1000/min!
22 9998.02.83		Before uncoupling or parking an implement, secure with wheel chocks to prevent rolling.
23 9998.02.86		Stop-cock to throughput and closed.
24 9998.02.87		Before transporting on roads, set to lock position with the shut-off valve open.

25 9998.02.88		Safety catch for road transportation on combi-wheel. Disengage safety catch before working in the field.

Operating Instructions

Seed Drill
Turbodrill L ... A & XL ... A

Before operating the seed drill for the first time, please read carefully through this operating manual and the safety precautions (”For your own safety”) and ensure that they are observed at all times. The same applies to the instructions for the combination implement.

Ensure that the operators are properly qualified, trained in its use and everyday maintenance, and familiar with the potential hazards and accident-prevention regulations involved. Make sure that other operators are supplied with a complete copy of the safety precautions.

Ensure that all applicable accident-prevention regulations are observed, along with other generally recognized safety procedures and any legislation that may apply with respect to health and safety in the workplace.
Observe the warning labels at all times!
Instructions in this manual accompanied by this symbol and a warning label indicate DANGER. (For further details, see the section entitled ”Key to pictograms”.)

Loss of warranty
This seed drill is designed and built exclusively for standard agricultural use.
Use for any other purpose will be regarded as unauthorized operation and no liability whatsoever will be accepted for any damage or injury that may occur as a result.

The term ”unauthorized operation” also covers the full observance of all operating, maintenance and servicing specifications and the exclusive use of original spare parts.

The use of non-original accessories, spares and/or consumables that do not carry specific approval from Rabe shall void all warranty liabilities.

We accept no liability for damage, loss or injury resulting from the carrying out of unauthorized repairs and/or modifications to the device nor from failure to monitor the implement’s use (especially in terms of seed rate and that all of the coulters are functioning!).

Claims resulting from missing or damaged items detected at the moment of delivery (transit damage, missing parts) should be made immediately and in writing.

Warranty claims, warranty conditions and our liability exclusions are based on our general terms of delivery.

Table of contents

Figure numbering: (13/1) means figure 13, item 1

Technical data
(subject to modification)

Turbodrill	L 300A/XL 300 A			XL 400 A				XL 450 A			XL 600 A
Working width/ transport width40	3.00 m**			4.00m*				4.50m*			6.00m*
Number of rows	30	24	30	40	34	30	26	40	36	30	40
Row spacing (cm)	10	12,5	15	10	11,8	13,3	15,4	11,3	12,5	15	15
Apprx. weight (kg) with Suffolk coulters band seeding coulters SAX- disc coulters**	625 642 696	614 628 675	579 590 626	685 707 779	657 676 737	639 656 710	621 635 682	725 747 819	707 727 792	672 682 743	805 827 899
Height for filling (when fitted with rotary harrow)	Approximately 175 cm/200 cm			Approximately 200 cm							
Overall height (when fitted with rotary harrow)	Approximately 215 cm/220 cm			Approximately 220 cm							
Seed hopper capacity	1000 l/1400 l			1400 l							
Increase in noise level** - in closed cab - with open rear panel**	1.5 dB (A) 7 dB (A)										

* Transport width greater than 3m – see page 24
** Width of tilling equipment also to be taken into account
***Weight of standard model see page 3 for weights of additional equipment
****As heard by the tractor driver at standard Pto rpm.

Equipment - standard model

- Quick coupling: three point hitch – as well as mounting kit for tilling equipment (e.g. A-frame, belt pulley, V-belts; approx. 30kg
- Seed hopper with low level indicator and metal lid, 2 filling hatches
- With V-belt drive (hydraulically optional)
- Ground wheel
- Infinitely variable oil bath gearbox
- Metering unit for coarse and fine seeds and emptying shutter
- Agitator shaft with detachable agitator fingers
- Calibration device
- Distributor head with two-way outlets (to coulters or back to the hopper)
- Universal or band-seeding coulters (exchangeable) with anti-blocking device
- Central and individual coulter adjustment
- Hydr. markers (400mm dia discs) with shear bolt overload protection (non-vertical lift for
- L300 A),
  XL 300 – 600 A with vertical lifting of marers
- Parking stands
- Lighting bracket for L 300 A and XL 300 A.

Equipment options and accessories

- Coulter harrow (approx. 0.6 kg/pair)
- Devided rear harrow in two rows with dragging tines (approx 16 kg/m)
- PERFECT harrow with individually sprung V- elements (approx. 22 kg/m)
- Tine protection for PERFECT harrow (3m, approx. 10 kg)
- Electronic tramline control with area counter and calibration assistant
- Tramline marking (320mm diameter discs, approx. 35 kg)
- Monitoring device for fan, metering, calibration flap, and hopper contents
- Hydraulic coulter pressure adjustment
- Hydraulic seed rate control
- Mechanical area counter (hectares)
- Filling platform (approx. 30 kg)
- Trailer bridge (1.5m), for loading sacks from trailer, approx. 33 kg
- Dust protection device (apprx. 11 kg)
- Free wheel clutch for fan drive
- Hydraulic fan drive
- Battery connection cable
- Adapter cable for 7-pin plug
- Cable extensions of 2 m, 4 m, 7 m, for equipment combinations
- Press wheel for single disc coulters
- Metering equipment for peas

1

Description of implement

The RABE pneumatic seed drill (Turbodrill L or XL) is A-frame mounted on a tillage implement.

Seeds from the large hopper (protected from rain-water and dust) are centrally metered for the full working width, and then evenly distributed to the seed coulters. Metering is controlled by a ground wheel. Air for transporting the seeds (dispensed by a distributor head to the sowing coulters) is generated by a low-noise blade wheel fan driven by through Pto or hydraulically as an option .

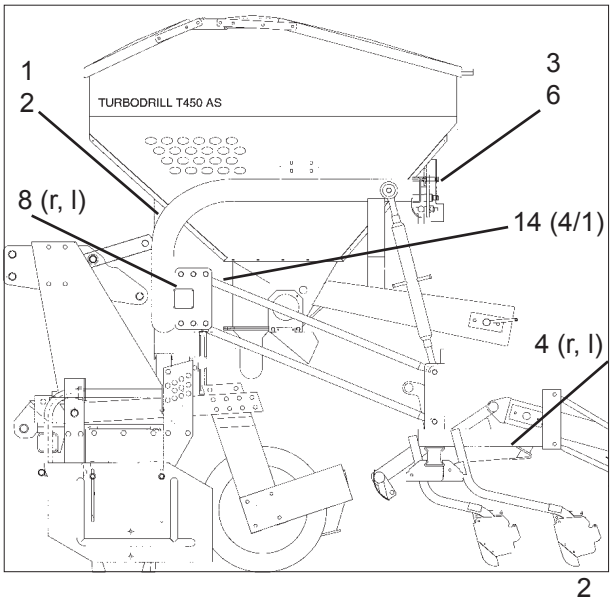
By means of a simple central changeover from coarse to fine seeds and an infinitely variable oil bath gearbox, any desired quantity of different seed types can be sown. Using hydraulic seed rate control, the seed rate can be adapted to differing soil conditions while on the move.

Suffolk and band seeding coulters can be exchanged without the use of tools. SAX- disc seed coulters are optional available.

Coulter pressure can be adjusted individually on each coulter and centrally either manually with a handle, or hydraulically.

The markers are adjustable for central marking. The electronic tramline system and the pre-emergence marking is automatically.

Features include a wide range of optional accessories for simple and efficient operation with low downtime, quick and straightforward calibration, and easy hopper emptying. In combination with the Rabe power harrow or cultivator, makes the Rabe Turbodrill a most effective drill combination.



2

Warning labels (pictograms)
The warning labels are used to indicate possible danger areas; they are designed to ensure the safety of all persons involved in the operation of the drill machine.
Please refer to the appendix entitled ”Key to pictograms” for further details. See Fig. 2 for details of their location (”3” etc. = code no., explained in same key to pictograms; r = right-hand side of implement; l = left-hand side of implement).

Replace any missing or damaged warning labels.

These can be obtained under the item numbers listed in the appendix, either from our agents or directly from RABE.

Safety precautions

DO NOT allow anyone to stand between the tractor and the implement during coupling or uncoupling. Note that this includes stepping between the tractor and implement to operate the external hydraulic controls (risk of injury).

Set the tractor's hydraulic lifting system to "position control" before coupling and uncoupling.

Before operating the tractor and the implement, ensure that they are both in safe operating condition. Ensure that the guards supplied have already been mounted.

Ensure that the tractor can be steered safely – even when transporting a full container - by attaching an adequate counterweight to the front of the tractor if necessary.

Do not transport when the seed hopper is full!

Take the centre of gravity into account when operating on steep slopes (along the contour line).

Before moving or operating the implement, always check to ensure that no one is standing within its turning circle or operating area.

DO NOT stand or ride on the implement (or loading platform) or remain within its turning circle or operating area.

Before leaving the tractor unattended or performing adjustments or service work, lower the combination, disengage the power take-off shaft, switch off the engine and remove the ignition key.

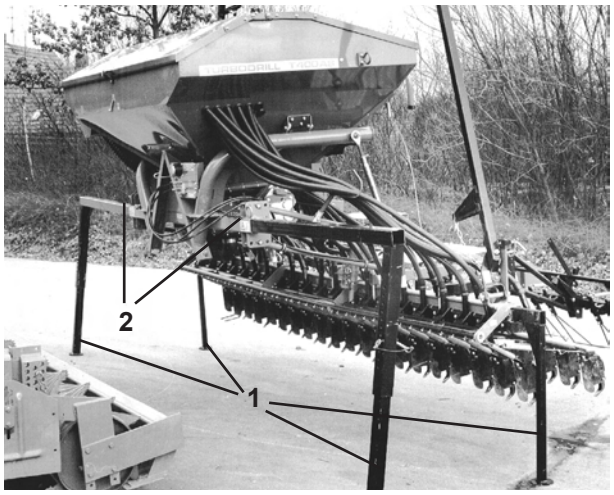
Handle transmission components with care, as they become hot during operation.

Before engaging the power take-off shaft ensure that:
... no one is standing within the operating area of the implement
... the speed selected for the power take-off shaft is within the permitted maximum turning speed of the implement
... the drive shaft operates with the specified tube overlap and that the cover tubes do not rotate.

Immediately shut down the fan drive if the blower begins to vibrate – then check the fan blade wheel as it has been wheel balanced!

When cleaning the implement with compressed air after sowing treated seed, always remember that dressing can cause skin irritation or may be toxic and that you should protect your body accordingly.

Before operating for the first time – or after long downtimes – check the levels of oil in the transmission as well as the belt tension and ensure that all bearings are adequately lubricated. Check all screws and bolts for tightness and the hydraulic unit for leaks.



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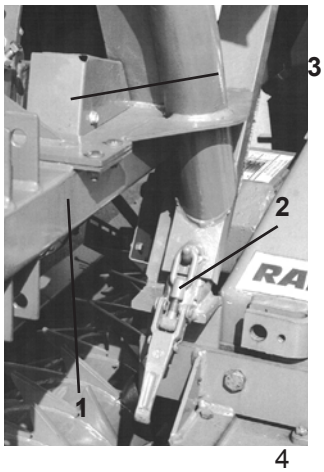

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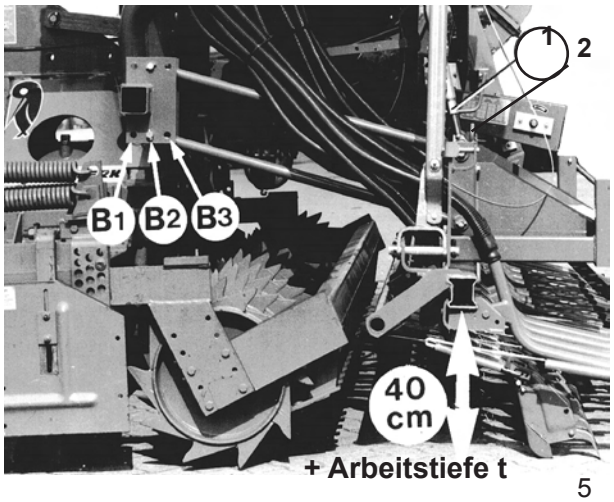

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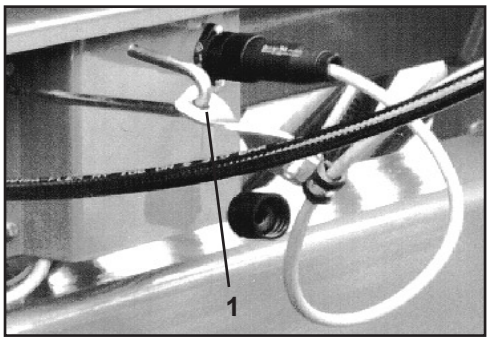

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Transporting instructions

For loading (lifting) always hook the drill machine at four points:
2 latches on the front cross-tube **(3/2)**
2 latches on the coulter rail **(5/2)**

Use a crossbeam and textile belting. Respect their loading bearing capacities.
Do not place yourself under a raised load.
Lift the drill machine on its own !**Not with the cultivator/power harrow unit** ! Ensure that the hopper is empty.

Assembly

Fit the A-frame and belt pulley on the cultivator/ power harrow as per the specific assembly diagram **(see appendix)**. Fit the A-frame perpendicular on the Pto through shaft. Adhere to the separation of 115mm and 1000 rpm on the Pto.

Move the combination unit underneath the seed drill, which is standing on its supports **(3/1)**, and raise the implement.

Connect the A-frame tight with the latches **(4/2)**. Adjust latch screws accordingly.

Remove the parking supports **(3/1)**.

Lower the combination.

Adjust the parallel mounting bars as closed as possible to the packer roller **(5/B1, B2, B3)**

e.g. Use B2 – for models MKE PKE, VKE & HKE
Use B3 – only for MKE with lever change gearbox

Adjust the distance of the lower edge of the coulter rail using the hand screw **(5/1)**. Under working conditions, set this distance to between 38 and 40 cm (see figure **5**).

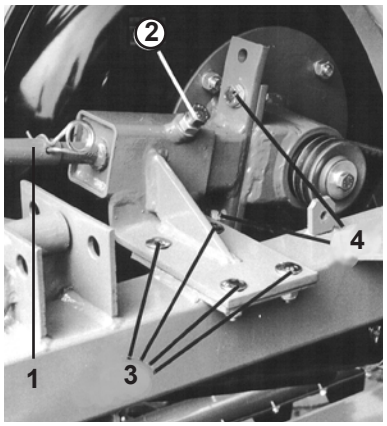
Connect hydraulic pipes (re: colour of protective caps):
Markers (3 to 4.5 m) – single acting control unit (red),
Folding for XL 600 A – double acting control unit – ensure correct connection:
Lift/ Folding(red)
Lower/Extend (yellow)

Lifting of marker arms for L 300 A – additional single acting control (green).

Hydraulic adjustment of coulter pressure - single acting control (blue)

Electricity supply for electronic tramline control: 12V from 3-pin constant current plug (DIN 9680) If this is not available, an extension cable to the battery with plug can be obtained from Rabe, or an adapter for a 7-pin trailer plug . **Parking lights must be switched on during work !**

Pass the cable through the hook to relieve the plug connection (see **6/1**).



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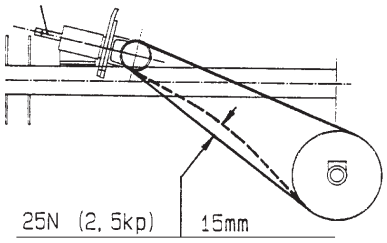

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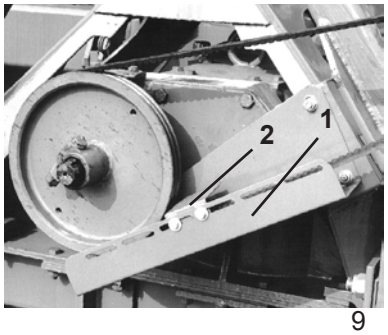

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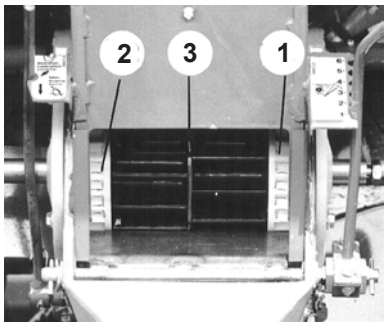

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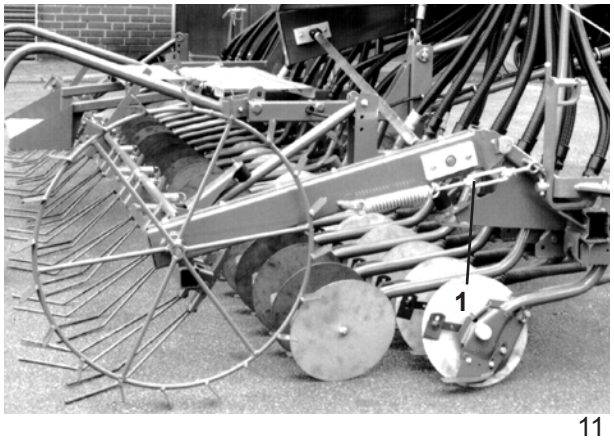

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V-belt drive: to install or remove v-belts, loosen the tensioner back to the stop with the hand screw (**7/1)**; beforehand release the fixing screw **7/2,** and tighten again after the belt has been tensioned.

Belt tensioning – see figure **8**:
Test tension with approx. **25 N**, permitted 'give' approx. **15 mm.**

Retension about 20 minutes after first use.

Check belt tension every day.

Pay particular attention that the drive unit is aligned exactly. If necessary, bring the fan into alignment using screws (**7/3** and **7/4**).

In the case of a belt failures, replace always both belts (XPZ belts – only use belts of the same length (L=L).

Keep the safety covers always fitted.
Keep both on the fan (**4/3**) and the belt (**9/1**), and the protective piece (**9/2**) close to the belt pulley.

Observe the special instructions for hydraulic fan drive (see appendix).

Note: to avoid excessive belt wear when using Pto shafts with cam clutches or hard engaging electro-hydraulic Pto clutches, we recommend the use of a free wheel clutch for the fan drive (optional accessory).

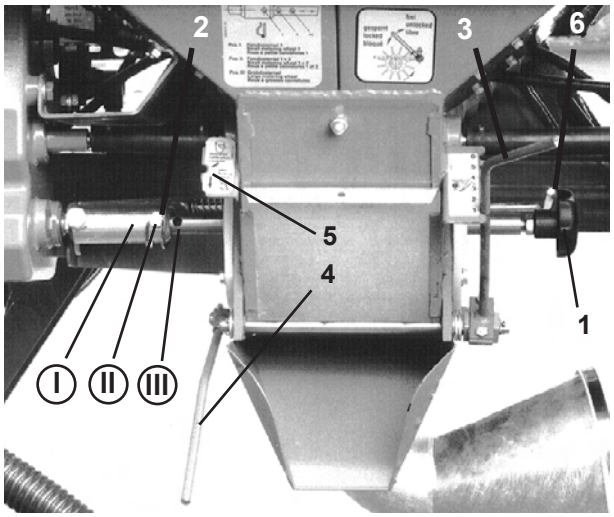
Adjustment of seed rate

One (**10/3**) coarse and two (**10/1+2**) Fine seed wheels with three adjustment positions are in control of the seed rate. An optional metering wheel is available for peas.

The drive is provided from a ground wheel which runs on the tilled surface. The ground pressure of the wheel is adjusted with a turnbuckle (**11/1**).

The following settings are required (see sowing chart):

1. Metering wheel position
2. Gearbox with adjustment lever
3. Bottom flap
4. Airflow valve
5. Calibration flap (to be disengaged only for calibration)
6. Agitator shaft .Remove agitator fingers for rape seed.



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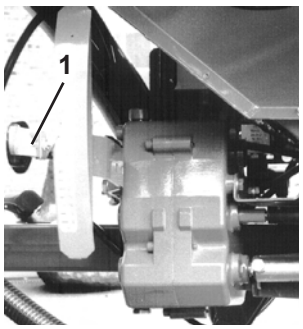

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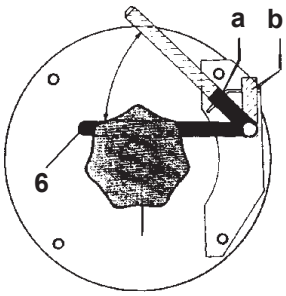

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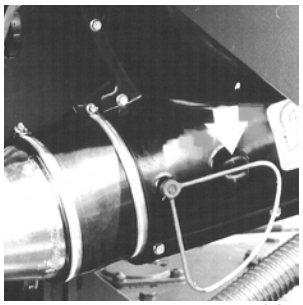
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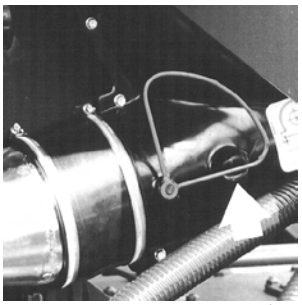
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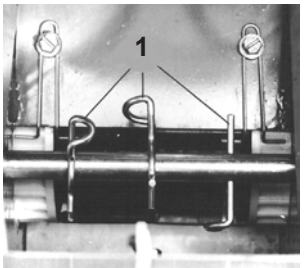

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1. Metering wheel: shift the hand screw (**12/1**) to reposition the shaft. Turn shaft slightly to fix the lynch pin (**12/2**). When resetting, put the bottom flap to position 'I'.
Position **I** – Fine seed wheel (**10/1**)
Position **II** – Fine seed wheel (**10/1+2**)
Position **III** – Coarse metering wheel (**10/3**)
In the fine seed positions **I** and **II** the centre metering wheel for coarse seed must be locked with the lever (**14/6**, **12/6**).
Position lever to the rear slot **14/a** - the metering wheel is locked.
Position lever to the front slot **14/b** for metering wheel position **III**.
If the lever (**14/6**) cannot be moved to the locking position (**14/a**) in metering wheel positions **I** and **II**, turn the metering wheel a little with the emptying shutter in open position.

2. Gearbox adjustment: the oil bath gearbox is infinitely adjustable between 0 and 100 (0=stopped). If a gearbox setting **less than 15** is required in metering wheel position **III** (Coarse seed), then change to metering wheel position to **II** (Fine seed) and engage both fine seed wheels 1+2. Recalibration with a correspondingly higher gearbox setting is required.
Fix the metering lever with the hand screw tight. But refer to page 12 when the seed rate is hydraulically adjusted.

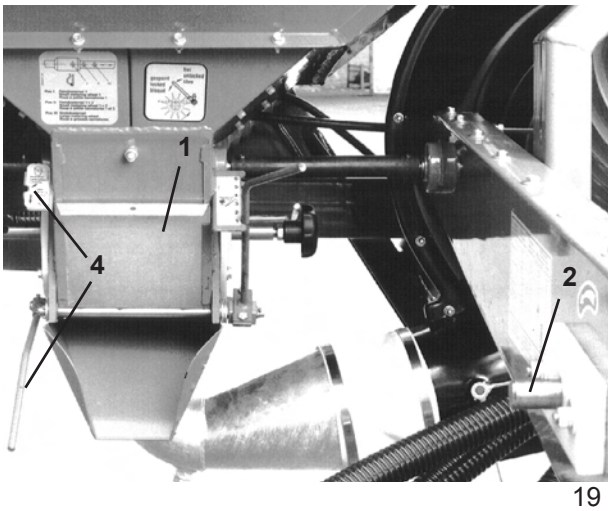
3. Bottom flap: adjust with the locking lever (**12/3**) according to the seed chart (1 to 6).
The bottom flap underneath the metering wheels closes off the metering unit. It is spring-loaded and can be put out of the way. When resetting the metering wheels, always put the bottom flap to position '1'.

If seed cracking is observed during calibration, set the bottom flap one position higher than stated in the sowing tables.

4. Airflow valve: Set open for standard (coarse) seed, figure **16** or closed for fine seed, figure **17**.
The airflow valve controls the quantity of air for transporting the seeds. **For hydraulic fan drive, always keep the airflow valve open – See Hydraulic fan drive instruction.**

5. Calibration flap: put the lever (**12/4**) in the 'up' position only for calibration. Under working conditions, (**12/5**) put the lever in the 'down' position.

6. Agitator shaft: This shaft ensures even seed flow. The clip on the outer agitator fingers should be facing inwards.
Remove the agitator fingers (**18/1**) for rapeseed. This can also be done for freely flowing peas, and perhaps beans.
Cleaner springs: These (**18/2**) keep the Fine seed wheels free from deposits (e.g. dressing from seeds). They are reversible, and should be replaced as soon as they become worn.



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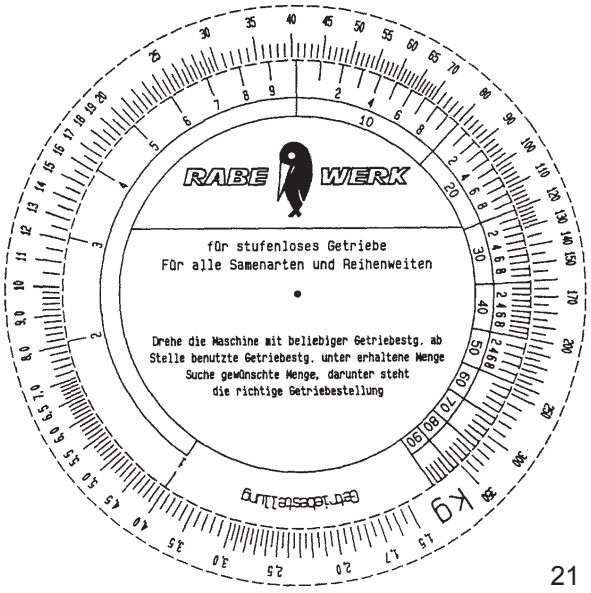

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Calibration

Lower the combination unit.
Close the emptying shutter (**19/1**).
Do the following adjustments according to the seed chart:

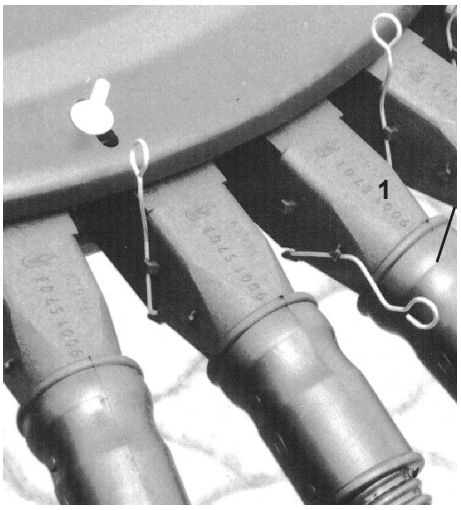
- correct metering wheel used
- Gearbox adjustment according to sowing rate
- Check bottom flap position
- Check airflow valve position

Load with seed (beforehand, if necessary, remove agitator fingers from agitator shaft for rapeseed).
Open the calibration flap. Put the lever (**19/4**) in the 'up' position. Place a collecting vessel under the discharge funnel. Fit the calibration crank (**19/2**) and make several revolutions so that all the cells are full. Empty the collecting vessel again.
Then turn the crank anticlockwise as follows, depending on working width and number of rows, for either 1/40 ha or 1/10 ha. Accurately weigh the calibration amount, and multiply this value by the 'area factor' to find the amount delivered in kg/ha:
x 40 (for 1/40 ha = 250m²)
x 10 (for 1/10 ha = 1000m²)

Working width	Row spacing	Number of rows	Number of crank revolutions	
			1/40 ha (250m²)	1/10 ha (1000m²)
3,0m	10,0 cm	30	42,3	169
	11,5 cm	26	36,6	146
	12,5 cm (2)	24	42,3	169
	15,0 cm (3)	20	42,3	169
4,0m	10,0 cm	40	31,7	127
	11,8 cm	34	27,0	108
	13,3 cm	30	31,7	127
	15,4 cm	26	27,5	110
4,5m	11,3 cm	40	28,2	113
	12,5 cm	36	25,4	102
	15,0 cm	30	28,2	113
6.0m	15,0 cm	40	21,1	85
6,0m (T 600)	10,0 cm	60	16,0 (4)	64,0 (4)
	11,5 cm	52	13,9 (4)	55,6 (4)
	15,0 cm	40	16,0 (4)	64,0 (4)

(1) 20 distributor head outlets
(2) 24 distributor head outlets
(3) 30 distributor head outlets
(4) crank handle revolutions

Because seed varies greatly in terms of specific weight, grain size, shape, and dressing, the sowing table values can only be treated as guidelines.
A calibration test should therefore always be carried out. If variations occur from the desired seed rate, recalibrate with a different gearbox setting – and use the sowing 'slide rule' provided for assistance (figure **21**).
(After calibration place the hand crank on the on the coulter pressure adjustment spindle or on the v-belt tensioner)
Note: The electronic tramline controller **Multitronic II** is equipped with a calibration assistant which can be used to calculate and count the number of revolutions of the calibration handle of the sowing monitor for the selected calibration area. See the instructions for use for Multitronic II in appendix A.



22

Drilling with twice the row spacing

If exceptionally only half the number of coulters is being used , then the non-sowing 2-way outlets must be changed – raise or lower the upper flap lever accordingly (**22/1**).
The gearbox needs to be adjusted for double the seed quantity in kg/ha.
For calibration use double the required seed rate.
The number of crank revolutions for calibration is as per the table.
For double or multiple row spacing (e.g. beans), do not fill the seed hopper completely.
Set the marker arms correctly.

Marker arm setting

The disc marker arms can be adjusted for center marking or wheel marking of the tractor.

Setting: put the disc marker extensions into the working position.

Set the disc marking point so, that the distance apart depends on the working width and the row spacing of the drill machine, as well as the tractor wheel spacing (when wheel marking is used) – see figure 23.

Adjustment with respect to center marking:

a) from the coulter rail=half the working width=**A**
b) from the outside of coulter =$\frac{\text{Working width+ row spacing}}{2}$ = **A1**

Adjustment with respect to wheel marking, (from the outside coulter):

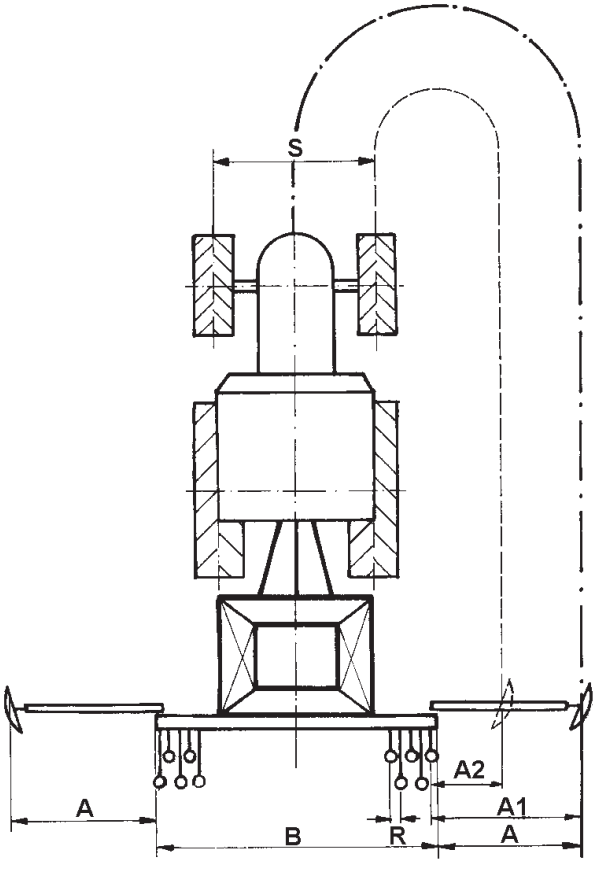
$\frac{\text{Working width+ row spacing – tractor wheel spacing}}{2}$ = **A2**

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

A=150 cm (center marking from coulter rail)

$A1=\frac{B + R}{2} = \frac{300 +10}{2} = 155$ cm

$A2=\frac{B + R – S}{2} = \frac{300 + 10 – 170}{2} = 70$ cm



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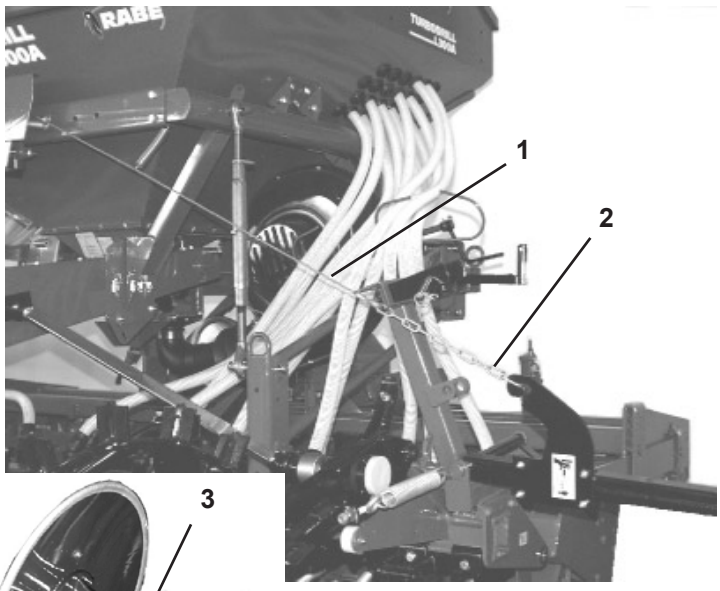

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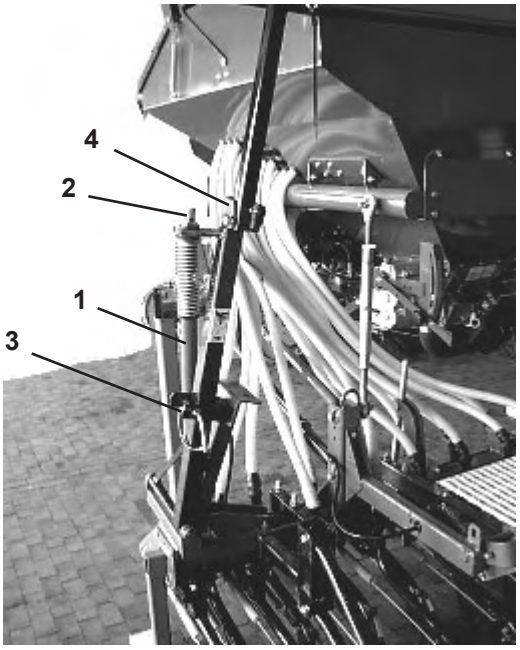


25

The marker arms are controlled by the tractor hydraulic system:

On completion of work, set to 'Raise' – both marker arms are raised
When starting work, set to 'Lower'

Under working conditions, the hydraulic controls must stay in the 'FLOAT' position.

For model XL 600 A set the hydraulics to the 'float' position already during the lowering operation.

For model L 300 A only single acting spool valves are required.

An auto switch controls the changeover. For default setting of the auto switch, refer to Maintenance.

The pulling cable should be under **slight** tension from the tensioning spring so that the disc can adapt to the ground, but so that the disc is held back and protected from overloading when rolling over a furrow. Lengthen or shorten the chains accordingly (**24/2**).

XL 600 A: double acting controls always in FLOAT position.

Changeover and counter impulses for electronic tramline control occur by means of a hydraulic alternating check valve when the marker arm is in the end position when being extended or retracted.

If the marker arm is retracted because of obstructions during use, an undesired counter impulse can be avoided by setting the marker arm only perpendicularly without reaching the end position. If the marker arm is to be fully retracted without creating an undesired counter impulse, then the tramline control should be set to **<OFF>**by pressing the tramline key twice. (See instructions for **Multitronic** in **Appendix A**)

The marker arm discs are lowered sufficiently by setting the cylinders (**25/1**) using counter nuts (**25/2**).
For this, lower the extensions.

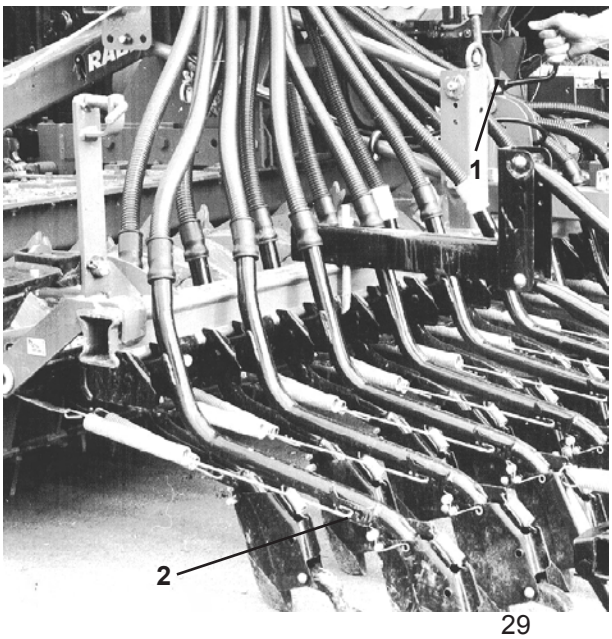
Do not screw down the nuts (**25/2**) too far. This will prevent the arm from abutting before the cylinder has fully descended.

Overload protection: If an overload has occurred, install new shear bolts:

- M8 x 40 DIN 931 8.8 (**25/4**)

The disc can be adjusted for light or heavy ground conditions by setting the disc axis (**24/3**) to achieve more or less grip.

For transporting, retract the marker arms and fix them (**25/3**).



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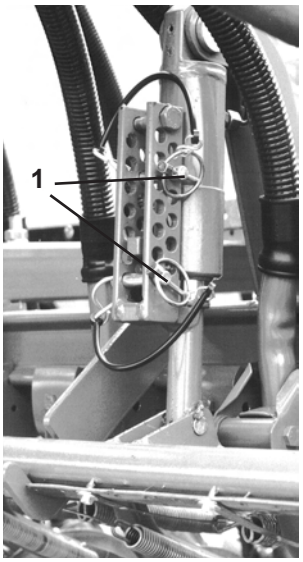

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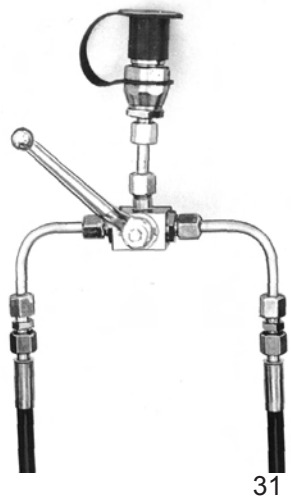

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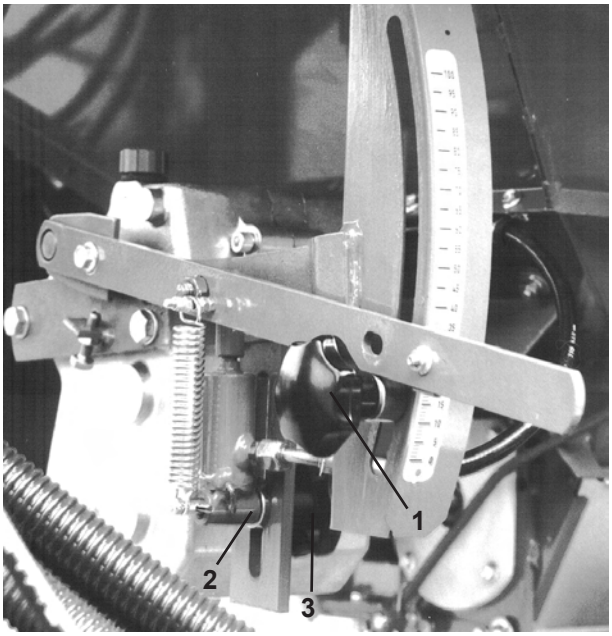


32

Coulter pressure

The coulter pressure – and thence the seed depth – is infinitely adjustable with a crank (**29/1**) The hand crank is the one used for calibration and belt tensioning.

Individual coulter adjustment (e.g. in the tracks of the tractor wheels) is achieved by repositioning the springs (**29/2**) to increase the pressure.

Even under the same soil conditions, the sowing depth can vary when the forward speed is increased or slowed down. Faster = shallower or slower = deeper. When testing the sowing depth, it is therefore necessary to be sure that during the test run, constant speed is maintained.

Adjustment of hydraulic coulter pressure

A single acting spool valve is required..

If the soil conditions vary greatly, this adjustment can be used to change the coulter pressure whilst on the move.

The normal and maximum pressures are preset by the location of pins (**30/1**) in the perforated bar.

Hydraulic seed rate adjustment

In connection with hydraulic coulter pressure adjustment, increasing the seed rate can be useful.

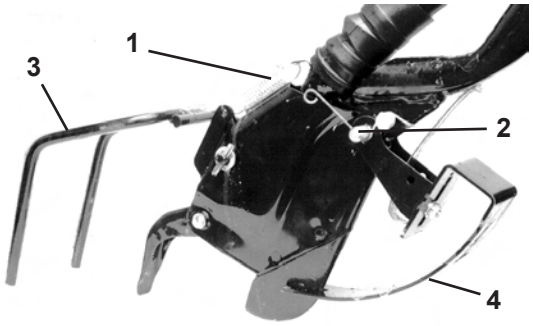
To do this, set the diverter valve (figure **31**) accordingly.

Setting of standard and maximum seed rate:
Standard – calibrate as usual, but set the hand screw as a stop (**32/1**) *below* the adjustment lever, and fix the position with the screw. For this, the hydraulic ram must be retracted.

Maximum – extend the ram fully, and set the maximum rate by moving the adjustment cylinder (**32/2**), and fix the position with hand screw (**32/3**).

Re-calibration of the seed rate is important.

Beware: Do not jam the gear adjustment lever in fixed position! The highest gearbox setting for standard seed rate = 100 less the desired extra rate (travel of ram).



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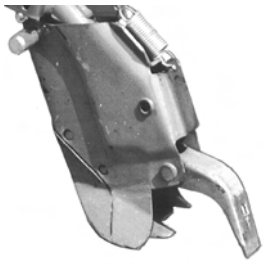

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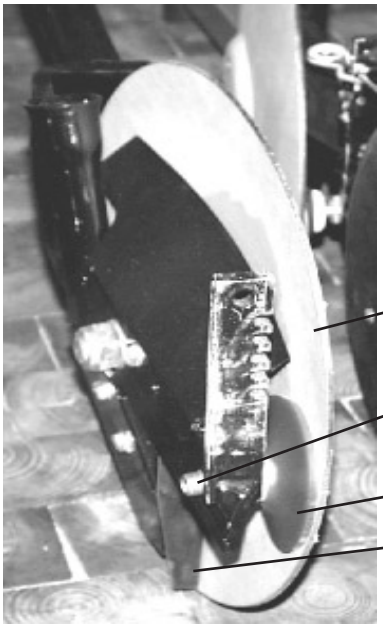

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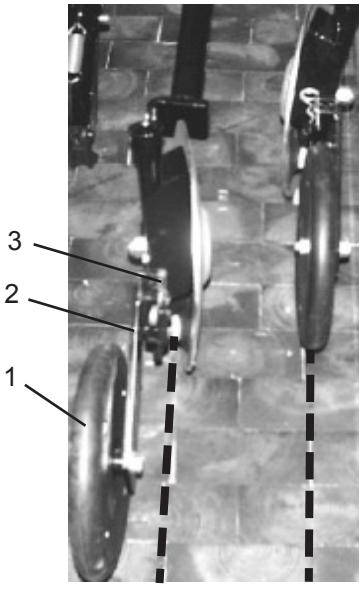


36

Coulter change system

Depending on the model Suffolk and band seeding coulters can be exchanged without the use of tools.

To do this, detach the springs (**33/1**) and withdraw the pins (**33/2**), which are secured by springs.

When refitting the pins, secure them again.

Depth limiters for Suffolk coulters (figure 33)

For shallow sowing, depth limiters (**33/4**) can be applied to the Suffolk coulters. They can be retrofitted.

Band seeding coulters (figure 34) The width of the band is approx. **8.5 cm**. Recommended for increased yields and broader seed distribution. They are suitable for clean fine structured and friable seed beds.
Suffolk and band seeding coulters have an anti-blocking mechanism. They can also fold forward when the drill is lowered on the ground to avoid bending of the seed pipes.

SAX disc coulters (figure 35) – useful in trashy conditions.

The rotating scraper (**35/1**) cleans the inside of the coulter disc (**35/2**) of adhering soil. Because of its curved design, the SAX coulter is self-cleaning.

The rubber flap (**35/3**) prevents seed grains from becoming misplaced in the furrows.

By turning the screw (**35/4**) in or out, the pressure of the rotating scraper can be adjusted. Fix the screw with the counter nut after adjustment.

Take care that the plastic disc of the scraper does not make contact at the front, as this would have a braking effect on the coulter disc.

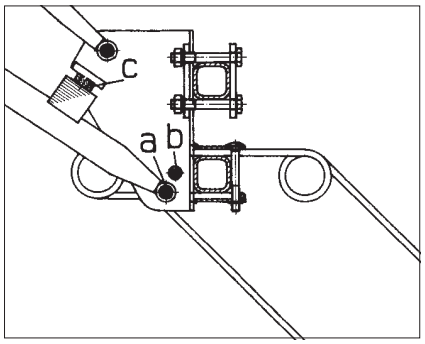
Press wheels (figure 36) optional accessory

The press wheels (**36/1**) are recommended to improve the seed / soil contact. There are two positions provided. The one position press close the seed in the slit and the other next to the row close the seed row.

Factory set is to roll on the slit.

If the pressure wheel is set to run alongside the seed row, the wheel (**36/1**) can be fitted to the other side of its arm (**36/2**).

The depth setting can be changed in steps of 1 cm by repositioning the R-clip (**36/3**).



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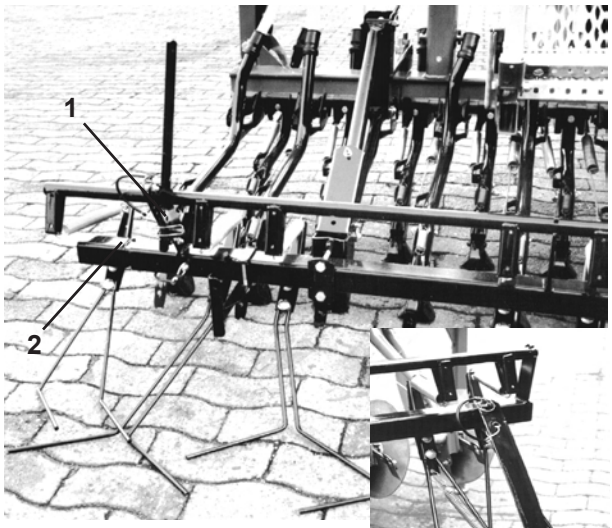

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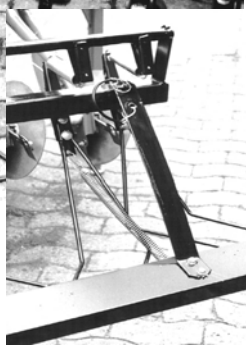

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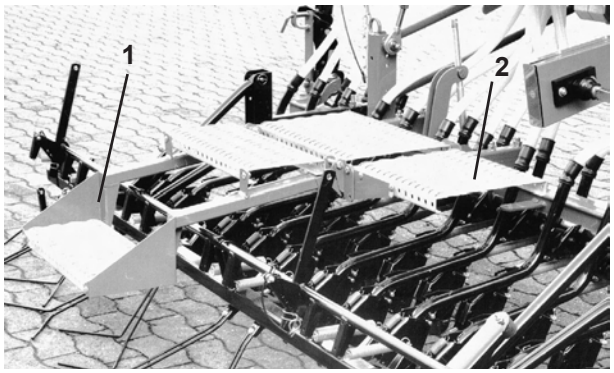

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Rear harrow types

Coulter harrow (figure **33**): only for Suffolk coulters . Can be fitted to the rear row of coulters.
Suitable for light to medium soils free of harvest residues.

Drag harrow (figure **38**): Divided, with two rows of dragging tines for medium to heavy soils. Tine pressure can be varied by repositioning the bottom rear harrow bar (**38/a+b**) by lowering or removing the nut (**38/c**) on the damper.

PERFECT harrow (figure **39**): suitable for all soils and uses.
The individually V- shaped and sprung harrow elements can be set centrally. Set the pressure (intensity) in advance by setting the pin as desired in the perforated bar (**39/1**).

XL 300 A: to get under the 3m width for transport, retract and fix the external harrow element (**39/2**) on the left hand side. Under working conditions, extend and fix this element. Use harrow covers as protection (optional accessory – see figure **40**).

Filling platform

Under working conditions fold up the lower step (**43/1**). When calibrating, fold in the right hand platform part (**43/2**).

It is forbidden to climb or travel on the platform while the tractor and unit is in motion.
Keep footboards clean.
Lower the unit before refilling and disengage the PTO shaft.
During refilling, protect body parts as seed dressing can be an irritant or poison.

Trailer bridge

For filling from sacks on a trailer.
Attach trailer bridge to the Turbodrill.
Make sure that it is securely supported.
After refilling, return the bridge to the trailer.

RABE Multitronic Seed Drill Monitor

45

Operating functions

The Multitronic II seed drill monitor is a compact on-board computer, which carries out a number of useful functions. It helps run important control and monitoring functions, providing practical display and system utility functions designed to simplify operation and save work.
The monitor is designed as a highly versatile unit, suitable for trouble-free application throughout both the the **TURBODRILL** range of pneumatic drills and for the MULTIDRILL range of mechanical drills.

There now follows a brief overview of these operating functions:

Control functions:
- Tramline set-up
- Additional tramline marking set-up
- Automatic or manual relaying of tramline cycles
- Interruption of automatic relaying of tramline cycles driving in order to drive around obstacles.

Display functions:
- Tramline cycle and tramline rhythm display
- Partial surface area hectare counter
- Total surface area hectare meter
- Drive speed
- Sowing shaft revolutions
- Fan unit turning speed

Monitoring functions:
- Sowing shaft monitoring
- Hopper level monitoring
- Fan unit monitoring

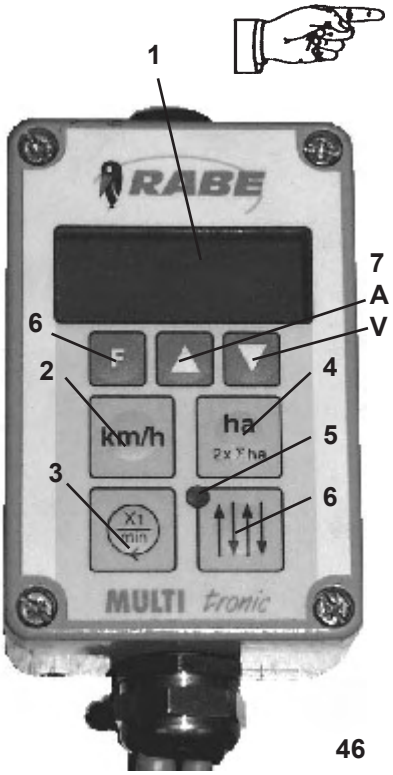
System utility functions:
- Sensor test
- Calibration assistant for calculation and inclusion of hand crank handle revolutions
- Calibration of hectare meter (adaptation of hectare meter to ground conditions)
- Adjustable time delay for automatic relaying of tramline cycle
- Menu language selection in German, French, or English

Starting the seed drill monitor for the first time
The Multitronic II monitor is activated by inserting the power supply plug un the socket. A short 'beep' horn signal indicates that the unit is active. The display is then active for about two seconds to show the type of machine in use: **>E-EL> for the Multidrill ME/MEL range** or **>turb<** for the **TURBODRILL** range of units.

If the wrong type of machine is displayed, the unit must be readjusted according to machine (see appendix A, sect.8) before the seed drill monitor can operate correctly.

Multitronic II quick start up instructions for the TURBODRILL

Detailed instructions for the Multitronic seed drill monitor are to be found in appendix A to this manual.



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Control panel of the Multitronic II monitor
Readout/Display (**46/1**), Function key drive speed (**46/2**)
Sowing shaft revolutions (**46/3**), hectare counter (**46/4**), LED (**46/5**)
tramline (**46/6**) and fan unit turning speed (**46/3**),
arrow keys (**46/7, A, V**) and **F**-key (**46/7**)

Readout push buttons

The green keys are readout push buttons.

Drive speed indicator (**46/2**)

Press once to readout drive speed.

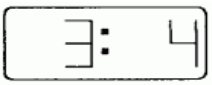
Readout hectare meter (**46/4**)

Push once to display partial surface area hectare meter.
Push twice to display total surface area hectare meter.
To reset the partial surface area hectare meter, press both arrow keys **A** and **V** for two seconds.
To reset both hectare meters, press the two arrow keys **A** and **V** for ten seconds

Display turnings (**46/3**)

Press once to display sowing shaft revolutions.
Press twice to display fan unit turning speed.

Tramline cycle and rhythm indicator (**46/6**)

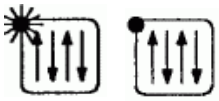


Use the arrow keys A or V to alter the tramline cycle manually (e.g. because of a sensor failure).

Left: **tramline pattern** (current lap) Right: **tramline rhythm**
(For setting tramline rhythm see **appendix A, section 5.1.1**)

Setting forward of tramline pattern:
The tramline cycle is set forward automatically by means of sensors or pressure switches.
However, the pattern can also be corrected manually during automatic counting:
Correction is made with arrow keys **A** or **V**.

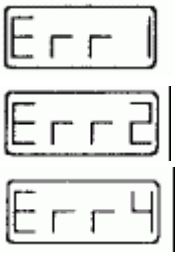
2x 



Use the arrow keys **A or V** to alter the tramline cycle manually (e.g. because of a sensor failure).

Press twice to switch **<OFF>**
LED (**46/5**) on = tramline active
LED (**46/5**) off = tramline inactive

Alarm/ error messages



<Err1> Sowing shaft/Calibration flap monitoring alarm
<Err2> Hopper level monitoring alarm
<Err4> Fan unit monitoring alarm

Main menu

Press the F function key to activate the main menu.
The seed drill is now running with ist default setting **<AdJU>.**
This operation also activates the system utility functions sensor test **<SEens<** and calibration assistance **<CAL>**

Installation instructions:

Mount the monitor in the tractor cab.
Electricity supply: 12 V from a 3-pin permanent current socket (if none is available, a battery connection cable with socket is available from RABE as an optional accessory, or an adapter for a 7-pin trailer socket **In work parking lights must be switched on.**

Fuse: The is a fuse fitted in to the socket
- if the fuse trips, it will automatically reactivate when the failure is fixed.

Connect the cable to the drill (relieve physical load on plug connection - see **figure 6**).

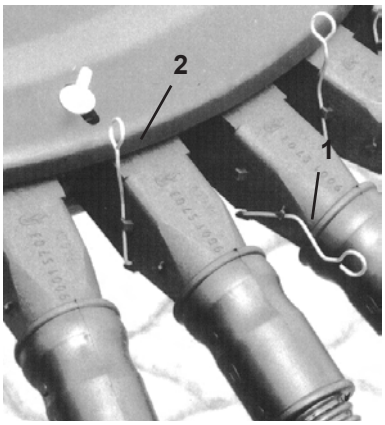
If the cable to the Turbodrill is too short, extension cables are available as optional accessories.

When travelling on roads, disconnect the electronic system from the on-board network (remove plug on tractor).

For examples of defining tramlines see page 20.

At the headland (with marker arm lowered on the field side) set the tramline pattern to the correct initial value, e.g. for the third and fourth rhythm set it to **2**. Automatic forward setting will take place by means of sensors, e.g. when the marker arm is changed.

For **symmetrical tramline rhythms** with even numbers, begin at the headland with half the working width of the seed drill. For this, close or divert the respective delivery tubes:
Fix the flap lever in the raised / forward position (**47/1**).



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If the fertiliser spreader has an border-spreading control, it is possible to begin at the headland with full working width **and tramlines**.

Up to three seed tubes per wheel track can be closed or diverted.
The seeds for the tramline are led through the delivery tubes in the distributor head back to the hopper. The precision of delivery is not altered.

'Switching off' occurs when the solenoid switch is supplied with current; thus for example, if an electronics failure occurs, it is possible to continue working with the full row number. If required, the flaps in the distributor head could be closed manually.

It is very simple to choose the correct rows for tram lining. Only – the lower seed pipes needs to be reset.

For **asymmetrical** tramlines, 'switching off' occurs on one wheel track side only for two opposing laps. The unneeded solenoid switch on the outside of the curve must therefore be deactivated by unplugging, depending on the direction of the curve chosen.

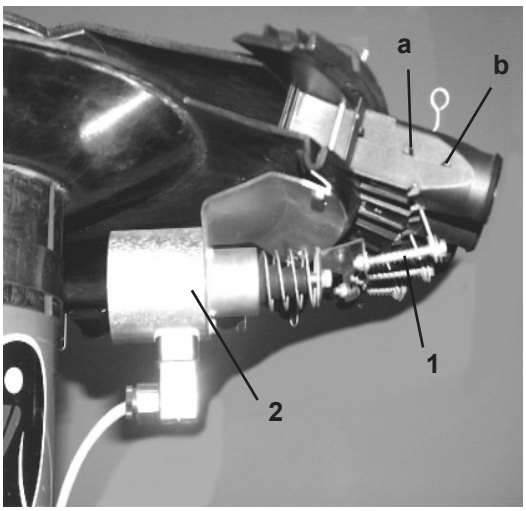
Note: As delivered, both solenoids are always connected.

If no tramlines are defined, but electronic monitoring wanted, rhythm '**0**' must be chosen.

For setting the tramline rhythm, see **appendix A, section 5.1.1**

The current operating data remain stored, so for example after a breakdown, the correct working rhythm is continued.

2-way delivery tubes: The upper flap lever on the tramline delivery tubes must be moveable between the end hooks (**48/a,b**).
The lower flap lever is connected by a screw (M 5 x 60) (**48/1**) and tension spring to the magnets (**48/2**).
Set the screw length so that when a tramline is active, the flap is set upwards in contact with the delivery tube wall.



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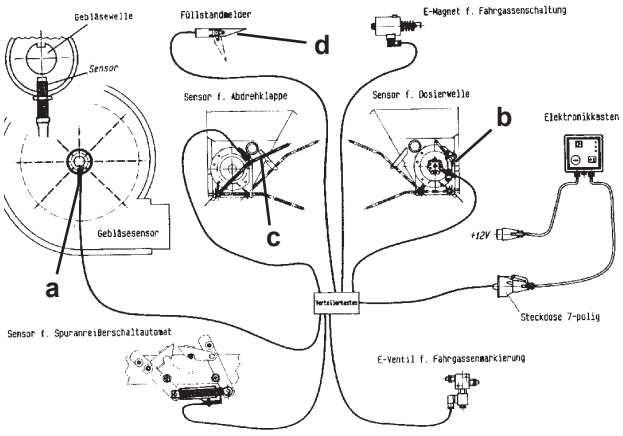
On standard (non-tramline) delivery tubes, the upper flap lever should be fixed upwards and backwards (**47/2**).

A maximum of three flaps can be held with a single solenoid switch.

Monitoring system, will work only when the tramline control is fitted.

Fan (**50/a**), metering (**50/b**), calibration flap (**50/c**), and hopper low level (**50/d**) can be monitored. Faults during use are displayed as ERROR on the monitor panel, together with a 'beep' sound.



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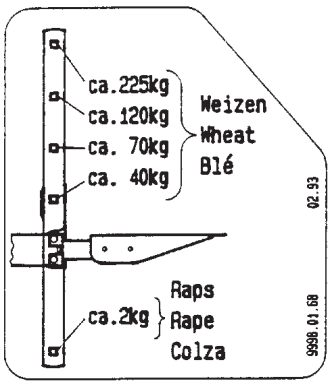

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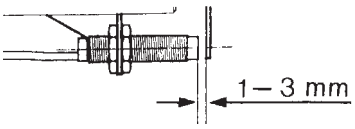

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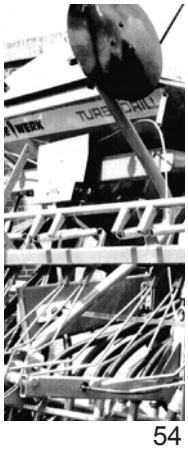

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Hopper contents level monitoring

The low level warning setting can be adjusted (see **figure 51**);
It is essential for rape seed to remove the protective sieve and agitator fingers.

Fan monitoring

This monitor gives a warning signal when the blower revolutions are too low or too high. In spite of this additional warning, it should be noted that the fan, when starting, runs at a higher speed; the power drive standard speed (about 1000 rpm) should be maintained.

When the marker arms are raised at the head land, fan and metering monitoring are suspended, and there is no alarm.

Coarse (standard) and fine seeds have different **fan speeds** if the fan is driven **hydraulically**. To get the correct warning, set the sowing monitor correspondingly (see **appendix A, section 5.1.7**):

Model	Drive	Metering	Revolutions
XL 300A	V-belt	Coarse seed	3000
		Fine seed	
	Hydraulic motor	Coarse seed	
		Fine seed	2300
XL 400 A - XL 600 A	V-belt	Coarse seed	3500
		Fine seed	
	Hydraulic motor	Coarse seed	
		Fine seed	2300

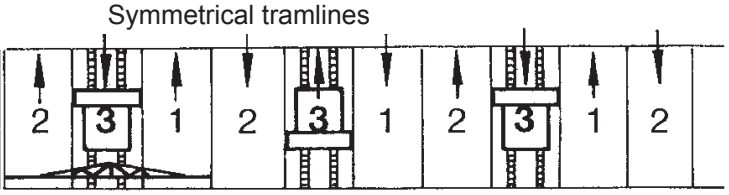
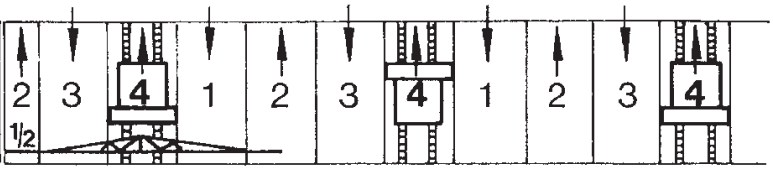
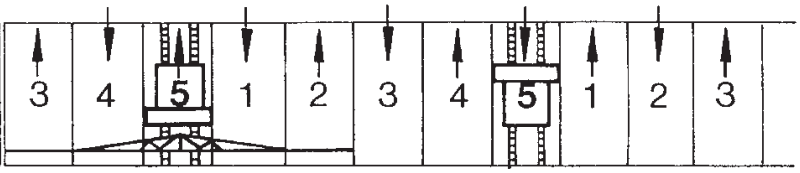
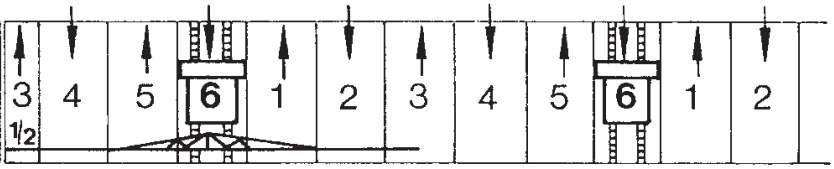
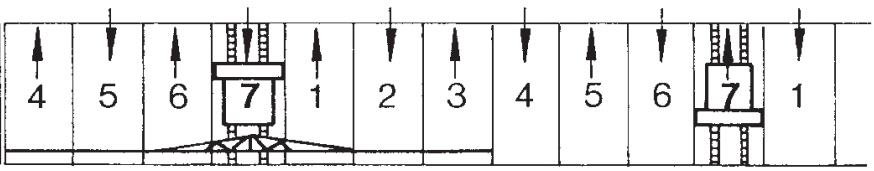
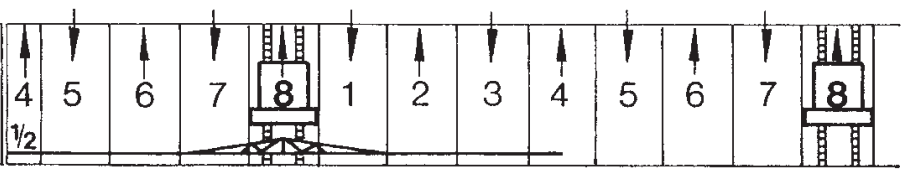
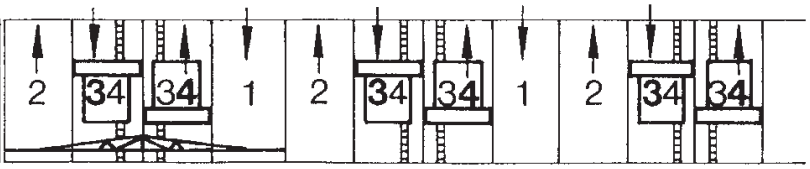
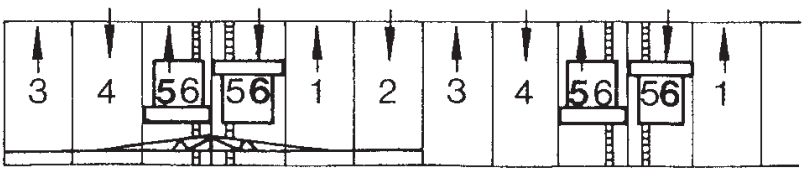
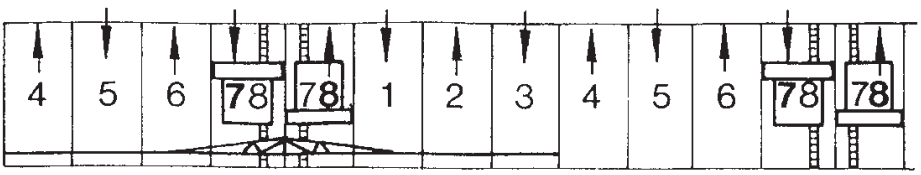
The inductive sensors are set with a gap of **1 to 3 mm** (**figure 52**). Set the fan sensor as follows:
Turn the fan shaft so that the groove is upwards.
Turn the sensor by hand as far as the blower shaft, then turn back 3.5 turns, and fix with the counter nut.

A function control (LED) is built into the sensors, so that when making a correction or a test circuit, the effect is visible.

Pre-emergence marking (only in connection with tramline system)

For pre-emergence spraying, the tramline track can be marked during sowing with marker discs (**figure 53**). The changeover is automatically. The electro-magnetic valve is fitted on the front side of the machine.
Set the marker arms to the width of the tramlines.
For transporting, raise the wheel arms and fasten (**figure 54**).
If the tramline are non-symmetrical (4S, 6S, 8S), the tramline marker which is not in use should be fixed in the raised position.

Seed charts

Working width of seed drill	Spraying width Spreading width	Tram-line cyc-les	Examples for tramlines
			Symmetrical tramlines
3,00 m 4,00 m 5,00 m 6,00 m	9 m 12 m 15 m 18 m	3	
3,00 m 4,00 m 4,50 m 5,00 m 6,00 m	12 m 16 m 18 m 20 m 24 m	4	
3,00 m 4,00 m 5,00 m 6,00 m	15 m 20 m 25 m 30 m	5	
3,00 m 4,00 m 4,50 m 5,00 m	18 m 24 m 27 m 30 m	6	
3,00 m 4,00 m	21 m 28 m	7	
3,00 m 4,00 m	24 m 32 m	8	
			Non-symmetrical tramlines
3,00 m 4,00 m 4,50 m 5,00 m 6,00 m	12 m 16 m 18 m 20 m 24 m	4 S	
3,00 m 4,00 m 4,50 m 5,00 m	18 m 24 m 27 m 30 m	6 S	
3,00 m 4,00 m	24 m 32 m	8 S	

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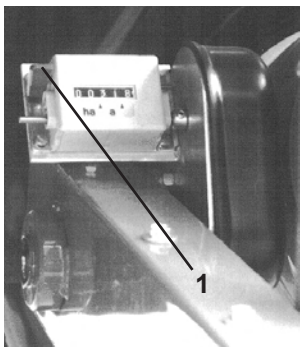

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Dust protection unit (figure **55**)

This draws in the fan air supply form a higher position, and maintains a slight over-pressure in the seed hopper.
Therefore keep the filling hatches closed when the unit is in use.

Hectare meter (mechanically) only if MULTI-TRONIC is not fitted.

Counting starts as soon as the ground wheel turns**.** Display is in one tenth of a hectare and full hectares.
Set to '0' with the lever (**56/1**)

Free wheel clutch
Jerky power drive starts and sudden stops cause heavy wear to V-belts and damage to V-belts and fan unit. For this reason a free wheel clutch should be installed:

a) in all cases when a PTO shaft with torque limiter clutch (cam clutch) is fitted
b) beneficial for tractors fitted with electro-hydraulically switched PTO

The speed at which the clutch cuts in is set at about 600 rpm. If the Turbodrill has not been used for an extended period, briefly run the clutch set at 500 to 600 rpm before using the unit, in order to clean it.

Arrangements for transport

Engage the lower link arms of the tractor in fixed position.

Close filling hatches.

Lift marker arms and secure with pins.

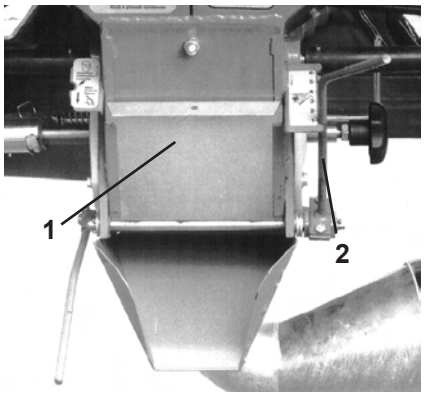
Fold the ground wheel up. Marker arms must be retracted first.

Fold up (if fitted) the pre-emergence markers and secure with pins.

Fit tine protection shields to the 3m Perfect harrow.
(This protection is an optional item of equipment)

Fit lighting set and warning beacons as per safety requirements.
s
Seed drill and tillers over 3 m wide should be transported on low bed trailer. For this, raise the rear harrows and loosen the upper harrow stays (**59/1**) at point (**59/2**), and fix the harrows with pins at (**59/2**).

For general transport instructions, see page 24.



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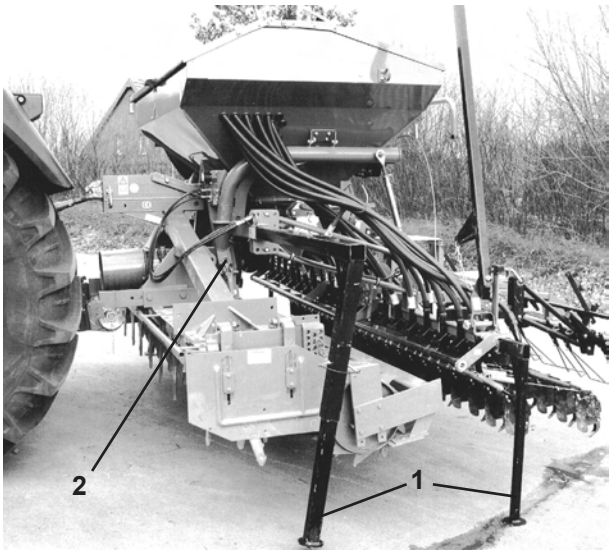

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Emptying of hopper

Lower the seed drill combination unit.
Place a collecting vessel under the discharge funnel.
Open the emptying hatch (**60/1**).
After emptying, set the calibration flap to 'Calibrate', and the bottom flap to '6'; turn all metering wheels a small amount with the star grip (**60/2**).
In order to remove all seed leftovers, run the blower briefly. This will avoid rodents being attracted.

Dismantling/Laying up

The Turbodrill seed drill combination is set on stands when dismantled. The seed hopper must be empty.
Insert all supports (**61/1**). Adjust the front supports so that when the machine is laid up, the A-frame leans slightly forward.
Detension the belt drive completely (see page **7**) and remove V-belts.
Disconnect hydraulic and electrical connections.
Disengage the locking (**61/2**).
Lower the tiller unit
Store the Turbodrill in a dry area after cleaning and protecting the coulters and marker discs against rust. Make sure that it is safely supported.
Take particular care that the monitor is kept dry.

Tips for use

- Make sure that the lower tractor link arms has only limited side play.
- Mount the top link so that when in use it rises only slightly to the implement. Set the length so that the PTO shaft and the input shaft are in a horizontal line.
- in operation, set the tractor hydraulics to 'FLOAT' position for hydr. lift and for markers .
- Observe the correct PTO speed. Check V-belt tension.
- Connect PTO only when the engine is idling. When hydraulically or pneumatically controlled PTO drive start jerkily, this can contribute to excessive V-belt wear. The use of a free-wheel clutch is recommended.
- Disengage PTO when the unit is raised high at the headland.
- Before the unit is lowered completely start with at least ¾ revs and then maintain the required rpm for the fan speed of approx. 3000 rpm for the XL 300 A and 3500 rpm for the XL 400 A and upwards.

- If the fan speed is much less than the standard value, there may be a loss of precision in distribution, or at high seed rates blockages can occur.
- Take care when starting sowing. Depending on the driving speed it requires a certain time for the seed to be transported from the metering wheel to the seed coulters. Therefore when stopping, raise the machine and reverse a little in order to avoid 'bald spots' in the field.

- Adapt the working speed to the conditions, so that the seeds are sown at an even depth. In good conditions the speed may go up to about 12km/h if the drill is mounted on a cultivator tiller unit.
- Check your settings, e.g. calibration test with calibration flap adjustment lever in lower position. Metering wheel position: coarse seed wheel engaged for fine seeds. Check gearbox setting, and airflow valve position. Adjust bottom flap if grain cracking occurs. Set the flap one notch higher than shown in the seed chart.

- When starting to sow, and then at regular intervals, check that all coulters are sowing, and that there are no blockages. When stopped and the unit is raised check whether a little seed lies under each coulter.
- **RABE accepts no responsibility for consequential damages due to blockages or variations in seed rates**.
- Seed delivery tubs must not sag. Set them so that they slope.
- The distance from the lower edge of the coulter rail to the ground should be approx. 38 to 40 cm.
- Make sure that the ground wheel presses against the ground sufficiently by setting the spring tension.
- Check the marker arms – correct adjustment and changeover.

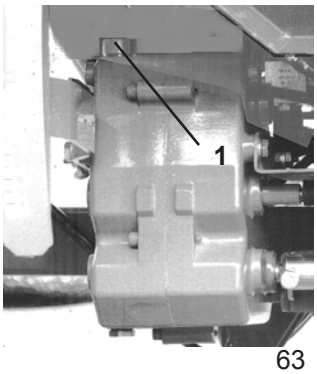
- For electronic tramline setting, check the rhythm and whether the delivery flaps switch over correctly.
- Check the hopper contents display.
  - Use a maximum of 10 kg of heavily dressed rape seed for each hopper filling to avoid blocking problems.
  - For seeds with a lot of husk, or if beans are being sown with double or more row separation, load the hopper only lightly.
- When filling the hopper, ensure that no foreign material (paper remnants, sack tags) get into the hopper.
- Raise the lower steps of the filling platform.
- Close the filling hatch.

- Because seed and dressing are hygroscopic, empty the seed hopper and metering wheels if the machine will be out of use for a period. Remember that dressing is an irritant and may be poisonous.

Maintenance

Working on the attached implement: lower the implement, disengage the power take-off shaft, switch off the engine and remove the ignition key. Secure the raised implement to prevent it dropping by accident.
Before working on any hydraulic parts, release the hydraulic pressure.
Dispose of used oil and lubricants correctly (mineral-based hydraulic oil).

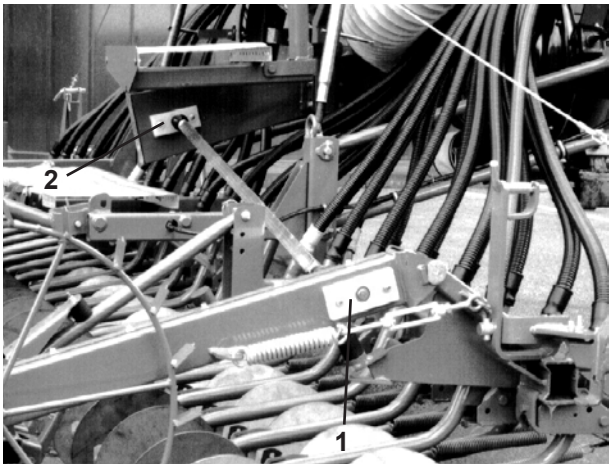
After about eight hours of initial use, check all screws and bolts for tightness.



63

Lubricate the disc bearings on the marker arm discs and tramline markings after approx. every 50 hours of operation.
Check the oil level in the transmission – do not twist in the dipstick (**63/1**) when checking the oil (Constant filling, fill to 2.5 l; when topping up with oil use hydraulic oil HLP 32)

Check all V-belts and belt tension as well as their alignment (see page 7). The V-belts should be loosened before parking the implement for longer periods of time.
Always replace defective V-belts in pairs and use XPZ belts of the same length.



64

Retightening the chain drive: loosen the bearings (**64/1+2**), tighten by hand and then re-torque the screws.

Ensure free movement of spindles and touch up any chipped or damaged paintwork.

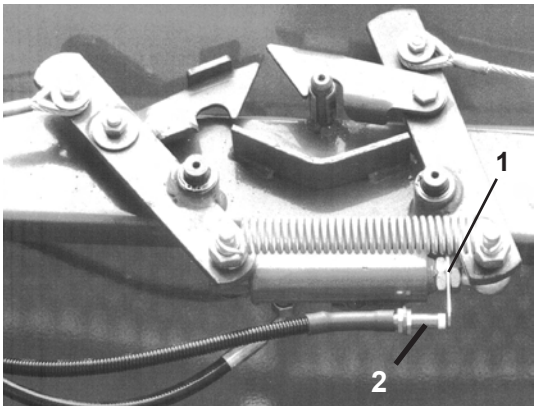
Keep the discs on the coulters clean at all times and check the scrapers.

Check the hydraulic lines regularly for signs of damage or brittleness and replace as required (see list of spare parts). These hoses are subject to a natural ageing process and should in any case be replaced after 5-6 years, regardless of their apparent condition.

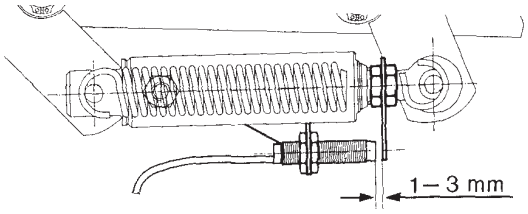
Avoid directing the hose at the bearings for any length of time when cleaning the implement with high-pressure water.

Use a damp cloth and mild cleansing agent to remove any dirt on the electronic unit (do not use solvents). Do not submerge the transmission in liquid.

Before performing welding work on the tractor or attached implement and when charging the tractor battery or connecting a secondary battery (starter battery) always ensure that you disconnect the electronic unit first.



66



67

Basic settings for marker switchover unit (only applies to Turbodrill L 300 A):

Swing the markers into working position: both markers should be raised.
Align the hexagonal nuts on the plunger (**66/1**, (use 24 mm spanner) until one pawl engages smoothly while the other pawl is disengaged.
Lock the counter nut securely.
Run a change-over test.

Basic adjustment of sensors (**66/2 + Fig. 67**)
The hydraulic ram must be closed completely: see also monitoring device on page 17.

Precautions / Road transport

Set the implement to its transportation position and check for roadworthiness.

Disconnect the electronic unit from the onboard system before driving on public roads (remove the plug connected to the tractor).

Do not allow persons to stand or ride on the implement, or remain within its turning circle or operating area.

Observe the relevant speed limits and traffic regulations when transporting the implement by road. Take care when negotiating curves, as towed implements tend to swing out.

The maximum permissible speed for transportation on long vehicles is 25 km/h (15 mph).

Observe your local road traffic regulations (Highway Code). These regulations normally hold the user responsible for the secure hitching and safe operation on public roads of the tractor and the implements being towed.

Implements must not impede the safe handling of the towing vehicle. The towed implements must not lead to any excess with respect to the permissible axle load of the tractor, the permissible total weight or tyre load (depending on speed and pressure) of the tractor. To ensure safe steering, the front axle load of the tractor must not be less than 20 % of the empty weight of the vehicle.

The maximum permitted transportation width is three metres. A special permit is normally required for moving oversized loads.

No avoidably overhanging item must endanger other traffic or road users (sect. 32 StVZO [German highway code] or your local equivalent). Overhanging items that cannot be avoided must be covered and fitted with warning signs. Safety devices include appropriate lighting and signs around all sides and the rear of the vehicle and towed implement, e.g. red/white striped warning labels (423 x 423 mm) and triangles (DIN 11030); 100 mm wide stripes at an angle of 45° pointing outwards and down).

Additional lighting is required if the towed implement blocks those already fitted to the tractor, or weather conditions make it advisable: e.g. to front and rear, if the towed implement is wider than the tractor’s lights by more than 40 cm, or overhangs by more than 1 metre with respect to the existing rear lights.

Required warning labels and lighting gear:

Calibration chart for L, XL 300 A (3.0 m working width)

Seed		Barley				Oats				Rye				Wheat			
Bottom flap position		1				1				1				1			
Metering wheel position		Coarse seed wheel III				Coarse seed wheel III				Coarse seed wheel III				Coarse seed 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	12,5*	15,0**	10,0	11,5	12,5*	15,0**	10,0	11,5	12,5*	15,0**	10,0	11,5	12,5*	15,0**
Gearbox setting	20									77	57	77	77				
	25	98	85	98	98					98	85	98	98				
	30	115	100	115	115	93	81	93	93	119	103	119	119	127	110	127	127
	35	134	116	134	134	110	95	110	110	140	121	140	140	149	129	149	149
	40	153	133	153	153	127	110	127	127	161	140	161	161	171	148	171	171
	45	172	149	172	172	144	125	144	144	182	158	182	182	193	167	193	193
	50	191	166	191	191	160	139	160	160	202	175	202	202	215	186	215	215
	55	210	182	210	210	177	153	177	177	223	193	223	223	236	205	236	236
	60	229	198	229	229	194	168	194	194	244	211	244	244	256	222	256	256
	65	248	215	248	248	211	183	211	211	265	230	265	265	280	243	280	280
	70	267	231	267	267	229	198	229	229	286	248	285	285	302	262	302	302
	75	287	249	287	287	247	214	247	247	307	266	307	307	325	282	325	325
	80	308	267	308	308	266	266	330	286	330	330	351	304	351	304	351	351
	85	330	285	330	330	286	248	285	286	355	308	355	355	378	328	378	378
	90	353	306	353	353	306	265	306	306	380	329	380	380	405	351	405	405
	95	377	327	377	377	327	283	327	327					432	374	432	432
	100	402	348	402	402	348	302	348	348					459	398	459	459

Important: The sowing rates given in the table in kg/ha are only guidelines.
The exact sowing rate can be determined only by a calibration test.

* = 24 Distributor head outlets

** = 20 Distributor head outlets

Calibration chart for L, XL 300 A (3.0 m working width)

Seed		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				Coarse seed 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	12,5*	15,0**	10,0	11,5	12,5*	15,0**	10,0	11,5	12,5*	15,0**	10,0	11,5	12,5*	15,0**
Gearbox setting	5																
	10	2	1,7	2	2					21	18	21	21	3,8	3,3	3,85	3,8
	15	3,2	2,8	3,2	3,2					33	29	33	33	5,3	4,6	5,3	5,3
	20	4,3	3,7	4,3	4,3					45	39	45	45	6,7	5,8	6,7	6,7
	25	5,4	4,7	5,4	5,4	5,2	4,5	5,2	5,2	57	49	57	57	8,0	6,9	8,0	8,0
	30	6,5	5,6	6,5	6,5	6,3	5,5	6,3	6,3	69	60	69	69	9,2	8,0	9,2	9,2
	35	7,6	6,6	7,6	7,6	7,4	6,4	7,4	7,4	81	70	81	81	10,4	9,0	10,4	10,4
	40	8,6	7,5	8,6	8,6	8,5	7,4	8,5	8,5	92	80	92	92	11,6	10,1	11,6	11,6
	45	9,7	8,4	9,7	9,7	9,6	8,3	9,6	9,6	103	89	103	103	12,8	11,1	12,8	12,8
	50	10,7	9,3	10,7	10,7	10,6	9,2	10,6	10,6	115	100	115	115	14,1	12,2	14,1	14,1
	55					11,8	10,2	11,8	11,8	127	110	127	127	15,4	13,3	15,4	15,4
	60					12,9	11,2	12,9	12,9	139	120	139	139	16,7	14,5	16,7	16,7
	65					14,1	12,2	14,1	14,1	151	131	151	151	18,0	15,6	18,0	18,0
	70					15,4	13,3	15,4	15,4					19,4	16,8	19,4	19,4
	75					16,8	14,5	16,8	16,8					20,8	18,0	20,8	20,8
	80					18,3	15,9	18,3	18,3								
	85					19,9	17,2	19,9	19,9								
	90					21,6	18,7	21,6	21,6								
	95					23,4	20,3	23,4	23,4								
	100					25,1	21,8	25,1	25,1								

Important: The sowing rates given in the table in kg/ha are only guidelines.
The exact sowing rate can be determined only by a calibration test.

* = 24 Distributor head outlets

** = 20 Distributor head outlets

Calibration chart for L, XL 300 A (3.0 m working width)

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

Important: The sowing rates given in the table in kg/ha are only guidelines
The exact sowing rate can be determined only by a calibration test. (Sow round peas and beans using a drill with an agitator
finger; when sowing phacelia, remove the agitator finger via the metering wheel).
* = 24 Distributor head outlets
** = 20 Distributor head outlets

Calibration chart for L, XL 400 A (4.0 m working width)

Seed		Barley			Oats			Rye			Wheat		
Bottom flap position		1			1			1			1		
Metering wheel position		Coarse metering wheel III			Coarse metering wheel III			Coarse metering wheel III			Coarse 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*
Gearbox setting	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	186	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

Important: The sowing rates given in the table in kg/ha are only guidelines
The exact sowing rate can be determined only by a calibration test.
* =30 Distributor head outlets

Calibration chart for L, XL 400 A (4.0 m working width)

Seed		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			Coarse 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*
Gearbox setting	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						

Important: The sowing rates given in the table in kg/ha are only guidelines
The exact sowing rate can be determined only by a calibration test.
* =30 Distributor head outlets

Calibration chart for L, XL 400 A (4.0 m working width)

Seed		Peas			Beans			Phacelia			Sunflower		
Bottom flap position		4			4			1			3		
Metering wheel position		Coarse metering wheel III			Coarse metering wheel III			Fine seed wheel II			Fine seed wheels 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*
Gearbox setting	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			

Important: The sowing rates given in the table in kg/ha are only guidelines
The exact sowing rate can be determined only by a calibration test.
* =30 Distributor head outlets

Calibration chart for L, XL 450 A (4.5 m working width)

Seed		Barley		Oats		Rye		Wheat	
Bottom flap position		1		1		1		1	
Metering wheel position		Coarse metering wheel III		Coarse metering wheel III		Coarse metering wheel III		Coarse 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)		10,0-15,0*	12,5	10,0-15,0*	12,5	10,0-15,0*	12,5	10,0-15,0*	12,5
Gearbox setting	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	352	348	313	435	392	459	413

Important: The sowing rates given in the table in kg/ha are only guidelines
The exact sowing rate can be determined only by a calibration test.

* = 30 Distributor head outlets

Calibration chart for L, XL 450 A (4.5 m working width)

Seed		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		Coarse metering wheel III		Fine seed wheel II	
Airflow valve position		Fine seed		Fine seed		Standard and coarse seed		Fine seed	
Row spacing (cm)		10,0-15,0*	12,5	10,0-15,0*	12,5	10,0-15,0*	12,5	10,0-15,0*	12,5
	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	40,6	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	16,2
	80			18,3	15,1			20,8	17,5
	85			19,9	17,9				
	90			21,6	19,4				
	95			23,4	21,1				
	100			25,1	22,6				

Important: The sowing rates given in the table in kg/ha are only guidelines
The exact sowing rate can be determined only by a calibration test.

* = 30 Distributor head outlets

Calibration chart for XL 600 A (6.0 m working width)

Seed		Barley		Oats		Rye		Wheat		Grass seed		Peas		Beans		Phacelia		Clover		Rape		Dressed rape **	
Bottom flap position		1										4				1				2			
Metering wheel position		Coarse metering wheel III														Fine seed wheel II							
Airflow valve position		Standard and coarse seed														Fine 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	10,0 15,0*	11,5	10,0 15,0*	11,5	10,0 15,0*	11,5	10,0 15,0*	11,5	10,0 15,0*	11,5	10,0 15,0*	11,5	10,0 15,0*	11,5
Gearbox setting	5																						
	10									21	18							3,8	3,3			3,0	1,7
	15									33	29							5,3	4,6			3,2	2,8
	20					77	67			45	39							6,7	5,8			4,3	3,7
	25	98	85			98	85			57	49	100	87			4,9	4,2	8,0	6,9	5,2	4,5	5,4	4,7
	30	115	100	93	81	119	103	127	110	69	60	121	105	118	102	5,9	5,1	9,2	8,0	6,3	5,5	6,5	5,6
	35	134	116	110	95	140	121	149	129	81	70	142	123	138	120	6,9	6,0	10,4	9,0	7,4	6,4	7,6	6,6
	40	153	133	127	110	161	140	171	148	92	80	163	141	160	139	7,9	6,8	11,5	10,1	8,5	7,4	8,6	7,5
	45	172	149	144	125	182	158	193	167	103	89	184	159	182	158	8,9	7,7	12,8	11,1	9,6	8,3	9,7	8,4
	50	191	166	160	139	202	175	215	186	115	100	205	178	204	177	9,9	8,6	14,1	12,2	10,6	9,2	10,7	9,3
	55	210	182	177	153	223	193	236	205	127	110	226	196	224	194	11,0	9,5	15,4	13,3	11,8	10,2		
	60	229	198	194	168	244	211	256	222	139	120	247	214	244	211	12,0	10,4	16,7	14,5	12,9	11,2		
	65	248	215	211	183	265	230	280	243	151	131	268	232	264	229	13,0	11,3	18,0	15,6	14,1	12,2		
	70	267	231	229	198	286	248	302	262			289	250	284	246	14,3	12,4	19,4	16,8	15,4	13,3		
	75	287	249	247	214	307	266	325	382			311	270	305	264	15,4	13,3	20,8	18,0	15,8	14,6		
	80	308	267	266	231	330	286	351	304			333	289	326	283	16,5	14,3			18,3	15,9		
	85	330	285	286	248	355	308	378	328			356	309	349	302	17,6	15,3			19,9	17,2		
	90	353	306	306	265	380	329	405	351			378	341	371	322	18,8	16,3			21,6	18,7		
	95	377	327	327	283	407	353	432	374											23,4	20,3		
	100	402	348	348	302	435	377	459	398											25,1	21,8		

Important: The sowing rates given in the table in kg/ha are only guidelines
The exact sowing rate can be determined only by a calibration test.

* =40 Distributor head outlets

Adjustment of the hydraulic fan drive

Default settings – Initial settings

Drills with hydraulic fan drives should be adjusted to the nominal rotational speed suiting the specific tractor. For Rabe seed drills, the following nominal rotational speeds are valid.

Model	**Nominal fan speed at 1000 rpm**	
	Coarse seed minimum	Fine seed rpm range
T 300 L /XL	3000	2300
T 400 XL to 600 XL	3500	2300
T 600	3500	2200 to 2500
T 602 F	3500	2800 to 3200

Table 1

All machines have been adjusted before delivery, and generally run in the correct rotational speed range.

However, assure and exact setting is only possible in connection with the tractor to be used, and is therefore imperative.

It is imperative that the machine is set up correctly, in order to avoid sowing faults due to insufficient rpm, as well as fan damage from excessive rpm

Set up/control should be carried out as described below.

1. Check before setting

I.1) The tractor must fulfil the following basic requirements:

a) Regardless of the oil circuit of the tractor hydraulics, a minimum oil supply of 35 l/min is required, such as the Fendt Favorit 600 with second hydraulic circuit.

b) or else a closed or Load Sensing hydraulic system with adjustable oil quantities, such as John Deere, Fendt Favorit 800 or Case Magnum, with hydraulic system pressure of at least 150 bar.

a) free return to the hydraulic oil reservoir (hydraulic couplings be supplied, type 4 with a pipe diameter of at least 22 mm. Connection point as per tractor manufacturer's instructions. (Fitting of the hydraulic couplings to the tractor for the return supply is not carried out by Rabe service)
b) Confirmation by tractor manufacturer that the hydraulic system is suitable for hydraulic motors.
c) Oil cooler for hydraulic oil.

I.2) Only adjust the rotational speed when the hydraulic oil is at working temperature.

I.3) Whenever possible, fit the hydraulic coupling to a spool valve on the tractor which will be served first.

II. Setting up

Attention: For drills with hydraulic blower drive, run with the airflow valve open for both coarse and fine seeds.

Remove the airflow valve or set it in a fixed position mechanically (at the factory).

II.1 Set up for coarse seed

In Fig. 1:

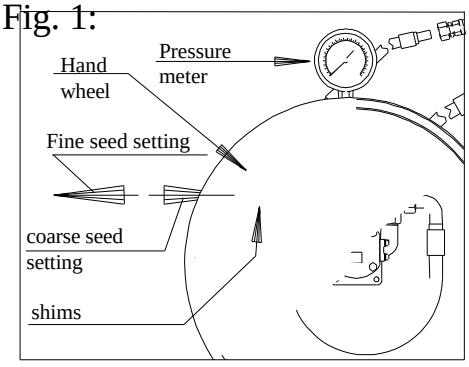


Fig. 1
Mounted drill

1. Turn the hand wheel completely in towards the control block (until checked).

2. Set the oil quantity adjustment lever on the tractor to low throughflow (about 1/3).

3. Start the fan (PTO- rpm at n=1000 rpm)
4. Test the fan speed with a proximity revolution counter.

See table 1 for nominal rotational speeds.
See figure 2 for measuring point.

Measurement of rotational speed and of pressure

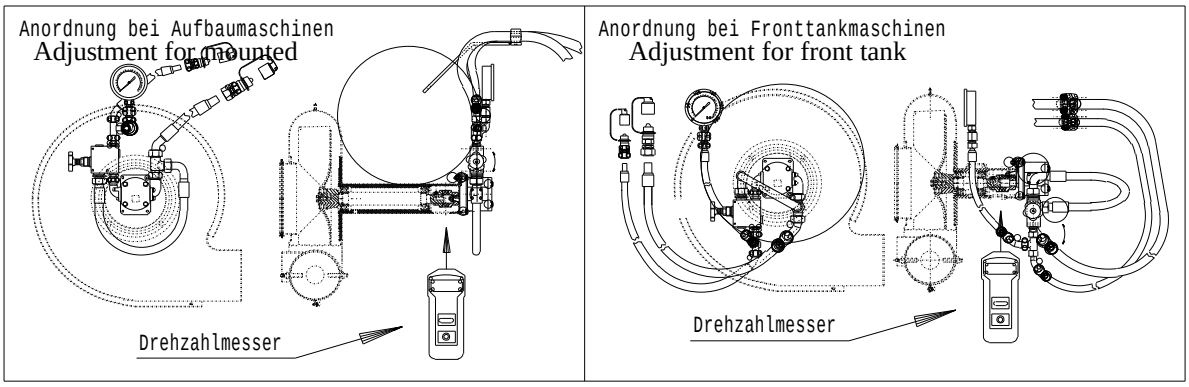


Fig. 2

Drills drills

1. If the nominal rotational speed of the fan is not reached, increase the oil rate on the tractor in steps.

If the required fan revs is still not achieved, a further increase to reach the nominal speed can only be obtained by removing shims individually from under the hand wheel on the control block (figure 1).

2. Reduce the revs to the PTO speed of n=850 rpm.

At this speed, the fan monitor (acustical and lights) should not be activated; if this does happen, slightly increase the oil quantity on the tractor (warning is cancelled).

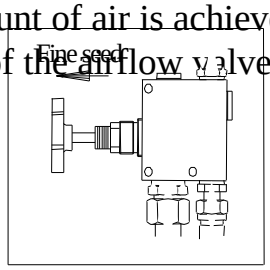
Note the settings: 1. Oil quantity lever on the tractor.
2. Oil pressure display on the drill.

Indicate the level on the pressure manometer with the marking arrow provided

Attention: This setting is only valid for the tractor which is connected.
If a different tractor is used, set up again.

II.2 Set up for fine seed

For drills with hydraulic fan drive, the reduced amount of air is achieved by reducing the fan speed, not by changing the setting of the airflow valve.



Carry out the adjustment as follows:

1. Turn the hand wheel completely away from the control block (until checked). See figure 3.
2. The oil quantity setting on the tractor remains unchanged from what has already been determined.

The required reduced fan speed is achieved automatically by the valve. If the fan speed is too low for fine seed, increase it according to table 1 by turning the hand wheel in.

Note the settings: 1. Oil quantity lever on the tractor.
2. Oil pressure display on the drill.

Indicate the level on the pressure manometer with the marking arrow provided

A well adjusted hydraulic fan drive works in the following pressure ranges:

Working setting	Pressure range	
	Up to 3m	4m to 6m
Coarse seed	70 to 90 bar	80 to 100 bar
Fine seed	30 to 40 bar	30 to 50 bar

Attention:

To achieve **constant revs** using tractors with Load Sensing System, all other connected hydraulic systems (coulter pressure, marker arms, pre-emergence marking) must be **reduced** to the **least possible oil quantity** which will ensure functioning.

Important:

For hydraulic fan drives, the seed drill must be equipped with fan monitoring, and the monitored speed should be set to 2300 rpm (see instructions manual for Multitronic II). This must be observed if the hydraulic drive is retrofitted.

Operating instructions

Seed drill monitor

Multitronic II *for*

Turbodrill L / XL ... A

Turbodrill XL Combi-Speed ... A

RABE

Multitronic II – Seed drill monitor for TURBODRILL

Contents Page

1) General information

In order to avoid operating and adjustment errors, please read the following references and explanations thoroughly before operating the unit.

2) Operating features of the seed drill monitor

2.1) Electrical connection

Power is supplied to the seed drill monitor from the tractor's 12V electrical system via a DIN 9680 plug connection. These three-pin plugs also exist in two-pin format, as only the two main terminals (+12V, earth) are required here.
On request, the seed drill monitor can also be fitted to operate via an ISO 11786 signal socket.

2.2) Technical data

Operating voltage:	+10V .....+15V
Power consumption of the seed drill monitor	70 mA
Operating temperature range:	-5°C ..... +60°C
Storage temperature	-25°C .... +60°C
Protection rating	IP65
Fuse	6A multi-fuse in power supply plug The circuit breaker resets itself automatically, once the short circuit has been dealt with and after a delay period of approx. 2 min has passed.
LCD unit:	Four-line back-lit display

2.3) Operating functions

The Multitronic II seed drill monitor is a compact on-board computer, which carries out a number of useful functions. It helps run important control and monitoring functions, providing practical display and system utility functions designed to simplify operation and save work.

The monitor is designed as a highly versatile unit, suitable for trouble-free application throughout both the "MULTIDRILL ME/MEL" range of mechanical seed drill machines and the "TURBODRILL" range of air-operated units.

There now follows a brief overview of these operating functions:

Control functions:

- Tramline setup
- Additional tramline marking setup
- Automatic or manual relaying of tramline cycles
- Interruption of automatic relaying of tramline cycles driving in order to drive around obstacles

Display functions:

- Tramline cycle and tramline rhythm display
- Partial surface area hectare meter
- Total surface area hectare meter
- Drive speed
- Sowing shaft revolutions
- Fan unit turning speed

Monitoring functions:

- Sowing shaft monitoring
- Hopper level monitoring
- Fan unit monitoring

System utility functions:

- Sensor test
- Calibration assistance for calculation and inclusion of crank handle revolutions
- Calibration of hectare meter (adaptation of hectare meter to ground conditions)
- Adjustable time delay for automatic relaying of tramline cycle
- Menu language selection in English, German or French

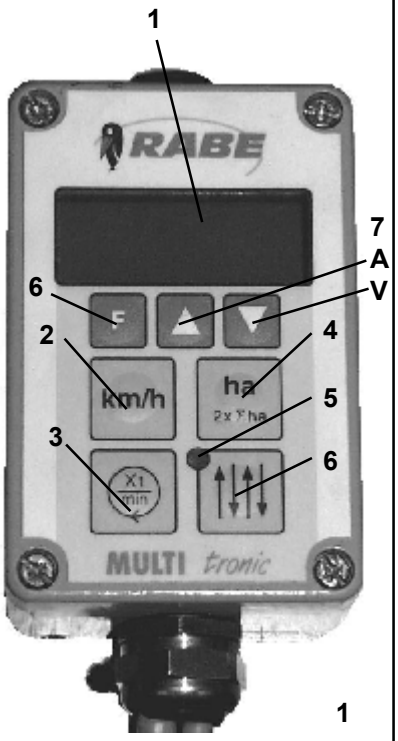
3) Starting the seed drill monitor for the first time

The Multitronic II seed drill monitor is activated by inserting the power supply plug in the socket. A short horn signal indicates that the unit is active. The display is then active for about two seconds, to show the type of machine in use: <**E-EL>** for the MULTIDRILL ME/MEL range of units or <**turb**> for the TURBODRILL range of units.

Displays can now be activated for drive speed, hectare meter, sowing shaft revolutions or tramline circuit.

<**E-EL**> should be displayed for the MULTIDRILL range.
<**turb**> should be displayed for the **TURBODRILL** range.

If the wrong type of machine is displayed, the unit must be readjusted according to machine type (see sect. 8) before the seed drill monitor can operate correctly.



4) Multitronic II quick startup instructions for the TURBODRILL

4.1) Control panel of the Multitronic II seed drill monitor

Readout/Display (**1/1**), Function key Drive speed (**1/2**), Sowing shaft revolutions (**1/3**) Hectare meter (**1/4**), LED (**1/5**), Tramline (**1/6**) and fan unit turning speed (**1/3**), Arrow keys (**1/7, A,V**) and **F**-key (**1/7**)

4.2) Readout pushbuttons

The green keys are readout pushbuttons

Drive speed indicator (**1/2**)

Push once to readout drive speed

Readout **Hectare meter** (**1/4**)

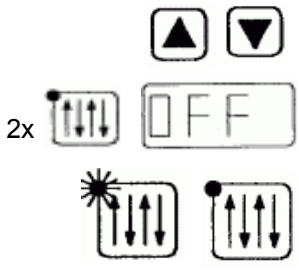
Push once to display partial surface area hectare meter
Push twice to display total surface area hectare meter

To reset the partial surface area hectare meter, press both arrow keys **A** and **V** for 2 sec.

To reset both hectare meters, press the two arrow keys **A** and **V** for 10 sec.

Display **Turnings** (**1/3**)

Press once to display sowing shaft revolutions
Press twice to display fan unit turning speed

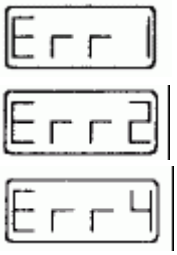


Tramline cycle and **Tramline rhythm** indicator (**1/6**)

Use the arrow keys **A** or **V** to alter the tramline cycle manually.

Press twice to switch <**OFF**>

LED (**1/5**) ON = tramline active
LED (**1/5**) OFF = tramline inactive



4.3) Alarm messages

<**Err1**> = Sowing shaft monitoring alarm

<**Err2**> = Hopper level monitoring alarm

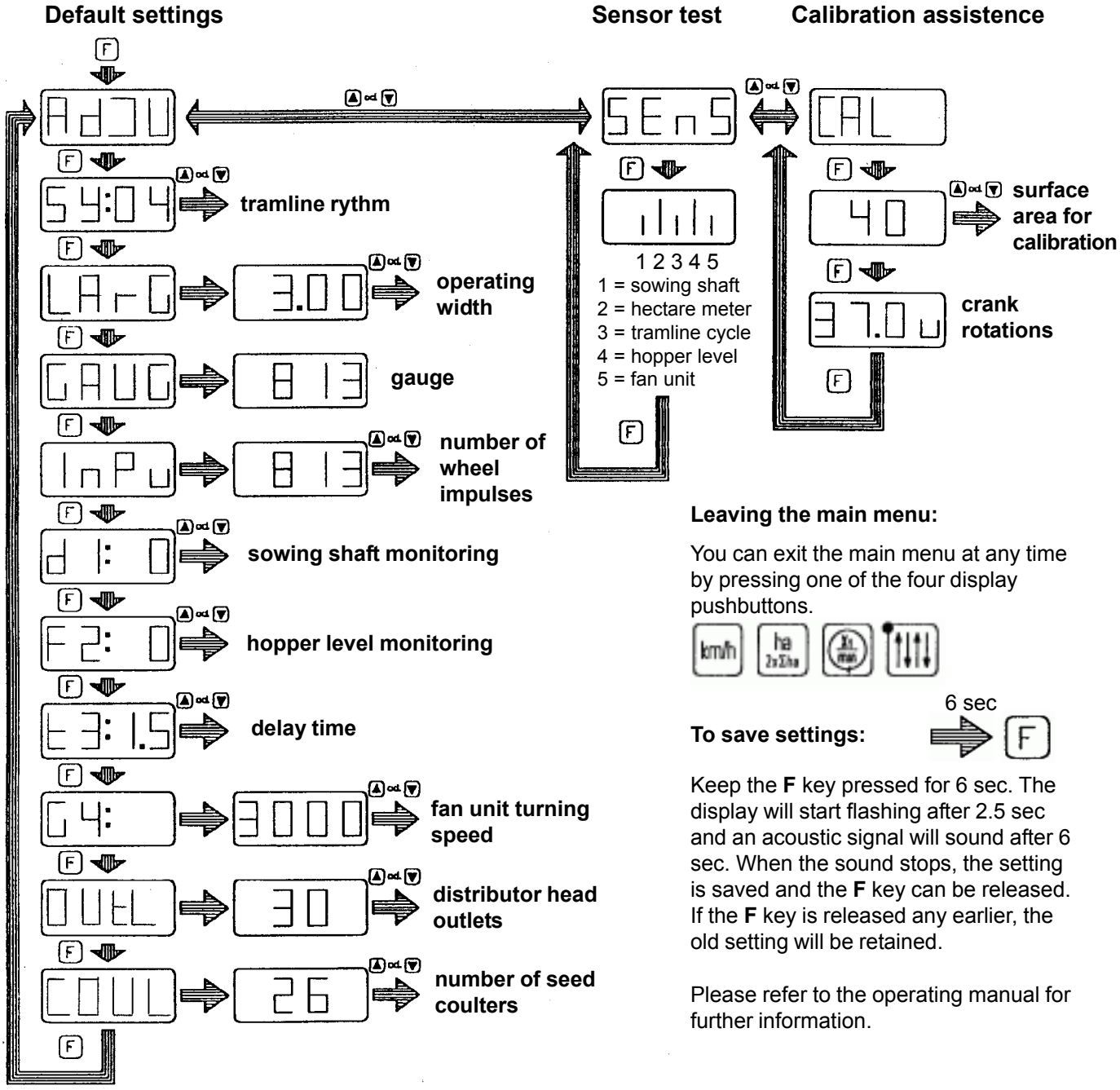
<**Err4**> = Fan unit monitoring alarm

4.4) Main menu

Press the **F** function key to activate the main menu.

The seed drill unit is now running with its default settings <**AdJU**>. This operation also activates the system utility functions sensor test <**SEns**> and calibration assistance <**CAL**>.

Quick guide Multitronic II TURBODRILL



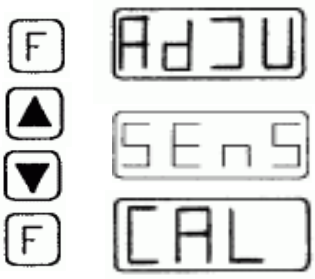
Leaving the main menu:

You can exit the main menu at any time by pressing one of the four display pushbuttons.

To save settings: 6 sec

Keep the **F** key pressed for 6 sec. The display will start flashing after 2.5 sec and an acoustic signal will sound after 6 sec. When the sound stops, the setting is saved and the **F** key can be released. If the **F** key is released any earlier, the old setting will be retained.

Please refer to the operating manual for further information.

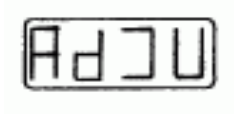


5) Multitronic II main menu for TURBODRILL

Three different functions can be activated via this menu:

Seed drill unit default settings <**AdJU**>
Sensor test <**SEns**>
Calibration assistance<**CAL**>

Press the **F** key and use arrow key **A** or **V** to select the desired function.
Press the **F** key again to activate the selected function.



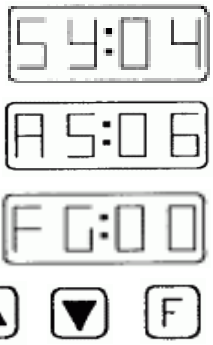
5.1) Default settings

The default settings must be established before the seed drill monitor can be used for the first time. This operation allows the seed drill monitor to receive data on the configuration of the seed drill unit.

Erroneous default settings lead to functioning errors and incorrectly calculated readouts.

Press the **F** key and use **A** or **V** to select the default setting.
Press the **F** key again to activate the default setting.

This operation displays the tramline rhythm setting.



5.1.1) Tramline rhythm

This menu allows adjustment of the symmetric and asymmetric tramline rhythms, or deactivation of the tramline circuit.

Symmetric tramline rhythms:

<**SY:02**>, **03**, **04**, **05**, **06**, **07**, **08**, **09**, **10**, **11**, **12**

Asymmetric tramline rhythms:

<**AS:02**>, **04**, **06**, **08**, **10**, **12**

Deactivated tramline circuit: <**FG:00**>

Use **A** or **V** to select the tramline rhythm and press **F** to save.
(See sect. 5.1.10)

The next stage is adjustment of the seed drill unit operating width

5.1.2) Operating width

The operating width symbol <**LArG**> is now displayed and, after three seconds, the previously set operating width.

Use **A** or **V** to select the operating width and press **F** to save.
(See sect. 5.1.10)

The following stage is hectare meter calibration.

5.1.3) Calibration of the hectare meter or entry of wheel impulses

An impulse count for an operating length of 100 m is required for accurate hectare metering and correct drive speed display.

This can be determined in two different ways:

Entry of wheel impulses using the table
Or by taking an actual reading of the number of impulses

The table value should always be entered first. Calibration of the hectare meter should only be carried out if the unit is giving inaccurate readings.

5.1.3.1) Calibration of the hectare meter

Calibration of the hectare meter involves adapting it to the ground conditions of the land being cultivated. This operation should only be carried out if the unit is giving inaccurate readings.
Calibration is carried out directly in the field.

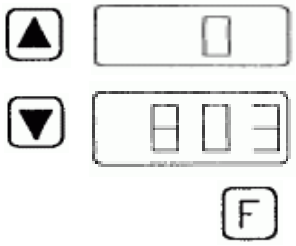
The calibration symbol <**GAUG**> will appear first, followed after 3 seconds by the previously set wheel impulse count.

Stop calibration:

If you need to stop the calibration procedure, or carry it out later, briefly press the **F** key. The program will then jump directly to the next adjustment setting menu, wheel impulses <**InPu**>.

Calibrating the unit:

Proceed as follows if calibration is required:



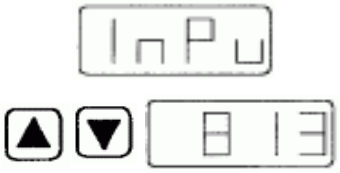
Drive the machine to the beginning of the field test section.
Measure out a 100 m stretch of field
Press arrow key **A** to display a zero
Drive along the test section. The seed drill monitor will now total up the number of hectare meter impulses.

After reaching the end of the test section, press arrow key **V** and the seed drill monitor will stop recording the number of impulses.

Press the **F** key to save the impulse reading. (See sect. 5.1.10)

The program will now move on to the next adjustment setting menu: wheel impulses <**InPu**>.

5.1.3.2) Entry of wheel impulses



The wheel impulse symbol <**InPu**> will be displayed first, followed after 3 sec by the previously set impulse count.

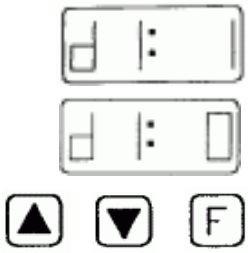
In the case of the TURBODRILL, impulse count depends on operating width:

TURBODRILL	Impulse count / 100m
3 m	813
4 m	1084
4,5 m	1220
5 m	1355
6 m	1626

Use arrow key **A** or **V** to select impulse count and press the **F** key to save. (See sect. 5.1.10)

The following step is sowing shaft monitoring adjustment.

5.1.4) Sowing shaft monitoring



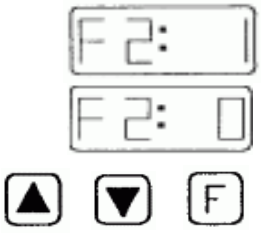
Sowing shaft monitoring is enabled or disabled in this menu.

Sowing shaft monitoring on = <**d1: 1**>
Sowing shaft monitoring off = <**d1: 0**>

Use arrow key **A** or **V** to enable or disable the monitoring function and press the **F** key to save. (See sect. 5.1.10)

The following step is hopper level monitoring adjustment.

5.1.5) Hopper level monitoring



This menu is used to enable or disable hopper level monitoring.

Hopper level monitoring on = <**F2: 1**>

Hopper level monitoring off = <**F2: 0**>

Use arrow key **A** or **V** to enable or disable the monitoring function and press the **F** key to save. (See sect. 5.1.10)

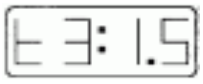
The following step is delay time adjustment.

5.1.6) Delay time

Delay time **t3** (t=time) involves delaying the switching impulses for automatic relaying of the tramline cycles. The purpose of this function is to avoid incorrect activation. Delay time is adjustable between 0.5 sec and 7.0 sec, steps of 0.5 sec.

The following values should be entered before operating the unit.

Automatic relaying via:	Display readout (= delay time in sec)
Automatic marker arm sensor	1.5
Shuttle valve pressure switch	1.5
Fendt signal plug socket	1.5
Ground wheel sensor	4.0



Other values can also be entered however. Use arrow keys **A** or **V** to select delay time and press the **F** key to save. (See sect. 5.1.10)

The following step is fan unit monitoring adjustment.

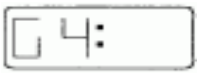
5.1.7) Fan unit monitoring

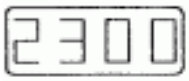
This menu is used to enable or disable the fan unit monitoring function. The symbol <**G4**> is displayed first, followed after 3 sec by the previously set fan unit turning speed.

When activating fan unit monitoring, there are 3 different fan unit turning speeds to take into account: 2300, 3000 or 3500 rpm.

The following table shows the speed that needs to be entered for each operation.

Machine type	Drive system	Metering	Turning-speed
XL300A	V-belt	Coarse-grain seed	3000
		Fine-grain seed	3000
	Hydraulic motor	Coarse-grain seed	3000
		Fine-grain seed	2300
XL400A – XL600A	V-belt	Coarse-grain seed	3500
		Fine-grain seed	3500
	Hydraulic motor	Coarse-grain seed	3500
		Fine-grain seed	2300





Use arrow keys **A** or **V** to select a fan unit turning speed from the table and press the **F** key to save. (See sect. 5.1.10).

To disable fan unit monitoring, use arrow keys **A** or **V** to select a fan unit turning speed of <**0**> and press the **F** key to save. (See sect. 5.1.10).

The following stage is adjustment of the number of distributor head outlets.

5.1.8) Number of distributor head outlets

The number of distributor head outlets is entered using this menu. This data is necessary for the correct operation of the calibration assistance function.

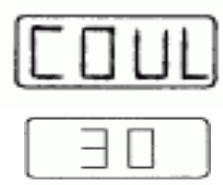
The symbol for the number or distributor head outlets <**OutL**> appears first, followed after 3 sec by the previously set number. An outlet count of 20, 24, 30, 40, 48 or 60 units can be selected.

Use arrow keys **A** or **V** to select the number of distributor head outlets and press the **F** key to save. (See sect. 5.1.10)

The following stage is adjustement of the number of seed coulters.

5.1.9) Number of seed coulters

This menu is used to enter the number of seed coulters. This data is necessary for the correct operation of the calibration assistance function.



The seed coulter number symbol <**COUL**> appears first, followed after 3 seconds by the previously set number.
10 to 60 seed coulters can be selected, but remember that it is not possible to select more seed coulters than there are distributor head outlets.

Seed coulter number from 10 to 20 units: adjustment in single steps.

Seed coulter number from 20 to 60 units: adjustment in double steps.

Used arrow keys **A** or **V** to select seed coulter number and press the **F** key to save. (See sect.5.1.10).

The seed drill unit default adjustment setting procedure is now complete. The program will now return to the main menu and the default setting symbol <**AdJU**> will be displayed once more.

Press any of the four green display pushbuttons to exit this menu.

5.1.10) Saving the machine settings

If the pre-set default settings are altered, they must be saved to memory.

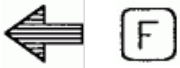
All settings can be saved in the same way:

6 sec

Keep the **F** key pressed for 6 sec.

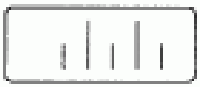
The display will start flashing after 2.5 sec and an acoustic signal will sound after 6 sec.

When the sound stops, the setting is saved.



The **F** key can now be released, giving automatic access to the following menu.

If the **F** key is released early, access is gained to the following menu, but any new setting that may have been entered will be ignored and the previous setting retained.



1 2 3 4 5

5.2) Sensortest

The sensor test offers a method of testing the function of the seed drill unit sensors.

Press the **F** key and use arrow keys **A** or **V** to select the sensor test function, then press the **F** key again to start the test.

A five-bar display will now appear:

1=Sowing shaft monitoring
2=Hectare meter
3=Tramline cycle relaying
4=Hopper level monitoring
5=Fan unit monitoring

Each bar shows the activation status of its corresponding control function.

For the hectare meter (Sensor with opening function):
Long bar = no metal detected
Short bar = metal detected

Tramline cycle relaying via

Automatic marker arm sensor (sensor with opening function)
Long bar = no metal detected
Short bar = metal detected

Shuttle valve pressure switch
Long bar = Switch under pressure
Short bar = Switch pressure released

Fendt signal plug socket
Long bar = lifting gear raised
Short bar = lifting gear lowered

Ground wheel sensor (sensor with closing function):
Long bar = metal detected
Short bar = no metal detected

For hopper level monitoring (limit switch with closing function)
Long bar = sensor angle vertical (seed hopper full)
Short bar = sensor angle horizontal (seed hopper empty)

For sowing shaft monitoring without fan module (sensor with opening function)
Long bar = no metal detected
Short bar = metal detected

For fan unit monitoring (always with fan unit module)

If the sensor moves up against metal, a long bar is displayed for 0.5 sec and then a short bar once more. If a change occurs in under 0.5 sec, a constant long bar is displayed.
If no signal is received, a constant short bar is displayed.

For sowing shaft monitoring with fan unit module

If the sensor moves away from metal, a long bar is displayed for 0.5 sec and then a short bar once more. If a change occurs in under 0.5 sec, a constant long bar is displayed.
If no signal is received, a constant short bar is displayed.

You can test the functioning of a sensor by holding a metallic object (e.g. a screwdriver) in front of the it and then moving it away again.

Pressure switch functioning, with closed hydraulic circuit, can be tested by raising the marker arms.

When the sensor test is over, press any one of the four green display pushbuttons to leave the menu.

5.3) Calibration assistance

Calibration assistance is a system utility for the seed calibration test. This function computes the number of crank rotations, showing them on the display, and also counts the number of crank rotations during the calibration test.

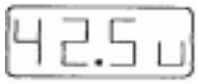
Press the **F** key and use arrow keys **A** or **V** to select calibration assistance<**CAL**>. Press the **F** key again to activate the function.

The following choice of surface areas for calibration will now be displayed:

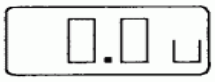
1/10 ha display <**10**>
1/20 ha display <**20**>
1/40 ha display <**40**>

Use arrow keys **A** or **V** to select the size of surface area to be calibrated and confirm the selection by a short press on the **F** key.

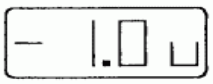
The seed drill monitor will now compute the number of crank rotations and display the figure. During this operation, values greater than 100 revolutions are displayed as whole figures. Values under 100 revolutions are shown exactly to the nearest half-turn.



The calibration test can now start. The seed drill monitor will now count the number of hand crank rotations, starting from the displayed value and running in reverse, thus providing a constant display of the crank turns that remain to be carried out. The final five turns of the crank are accompanied by an additional acoustic signal, in order to warn the operator of the impending end of the calibration procedure.



Once the value reaches zero <**0**> a constant acoustic signal is activated to warn the operator to stop calibration immediately.



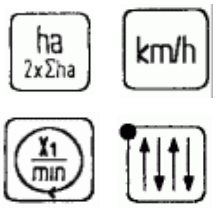
If calibration does continue, the display will show the corresponding negative value and the constant acoustic signal will continue to be heard until no more impulses are being detected at the hectare meter.

To repeat the calibration test: press the **F** key, the calibration test will restart from the beginning.

To stop the calibration test, press any one of the four green display pushbuttons to leave this menu.

6) Display (readout) pushbuttons

The green keys are the display pushbuttons, which are used to operate the following functions:



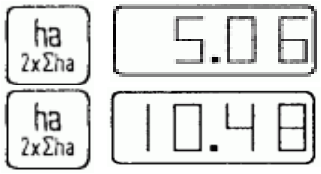
Display / reset hectare meter
Display drive speed
Display sowing shaft revolutions
Display fan unit turning speed
Display / alter tramline cycle

6.1) Hectare meter

The seed drill monitor operates via two separate hectare meters: namely a partial area meter and a total surface area meter.

Data are displayed as follows, with floating decimal point:

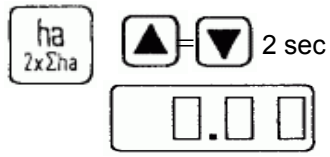
0.00 – 9.99 10.00 – 99.99 100 – 999 1000 – 9995

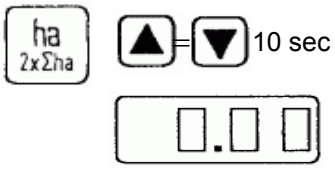


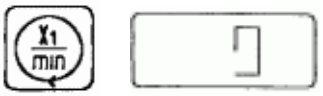
6.1.1) Partial / total surface area meter display

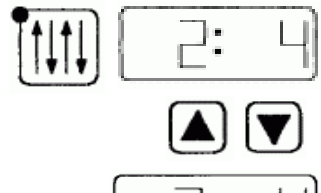
Press the display key to show the partial surface area count.

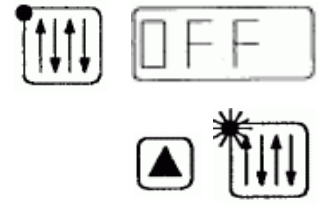
Press the display key again and the total surface area count will appear for 5 sec, followed once more by the reading for the partial surface area hectare meter.

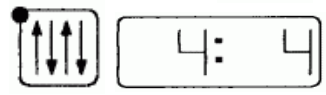












6.1.2) Partial hectare meter reset

Press the display key to show the partial surface area meter. Now press both arrow keys **A** and **V** at the same time and maintain pressed for 2 sec. The display will now start flashing and will reset to zero <**0**> after a further 2 sec, when it will stop flashing. This completes the reset procedure.

6.1.3) Partial surface area and total hectare meter reset

Press the display key again to show the total hectare meter. Now press both arrow keys **A** and **V** at the same time and maintain pressed for 10 sec. The display will now start flashing and will reset to zero <**0**> after a further 10 sec, when it will stop flashing. This completes the reset procedure.

6.2) Drive speed display

Press the display key to show drive speed in km/h.

6.3) Sowing shaft revolutions display

Press the display key to show sowing shaft revolutions as a rotating <**0**>.

6.4) Fan unit turning speed display

Press the display key again to show fan unit turning speed.
This reading is shown rounded off to the nearest 100 rpm.

6.5) Tramline cycle

The tramline cycle can be displayed and altered, with tramline cycle relaying being carried out either automatically or manually.
It is also possible to interrupt automatic relaying, when avoiding obstacles for example, without altering the tramline cycle itself.

6.5.1) Tramline cycle display / adjustment

Press the display key to show the tramline cycle and rhythm.

Left : **Tramline cycle** Right : **Tramline rhythm**

Please refer to sect. 5.1.1 for details of tramline rhythm adjustment.

Tramline cycle relaying:

The tramline cycle is automatically relayed by means of sensors or pressure switches,
although it can also be activated manually.

Use arrow keys **A** or **V** to alter the tramline cycle

Once a tramline is established, the red LED in the tramline display key will light up.

6.5.2) Automatic relaying interruption

Press the display key again to make <**OFF**> appear. This operation interrupts automatic relaying of the tramline cycle. It is now possible to operate the marker arms or raise the seed drill unit, without relaying the tramline cycle. The tramline can now also be directly activated or deactivated:

Tramline ON: press arrow key **A** (LED lights up)

Tramline OFF: press arrow key **V** (LED goes out)

Press the display key again to return to normal tramline cycle relaying. The tramline cycle that was active before the interruption will now reappear on the display.

7) Alarm functions / messages

Seed hopper level, fan unit turning speed and sowing shaft revolutions can be monitored, on condition that the seed drill unit is fitted with the corresponding activated monitoring device. (See sections 5.1.4 and 5.1.5 for information on activating hopper level and sowing shaft monitoring. For fan unit monitoring, see sect. 5.1.7).

The monitoring systems are only active when the seed drill unit is in operating position (with lowered seed drill unit and/or marker arms).

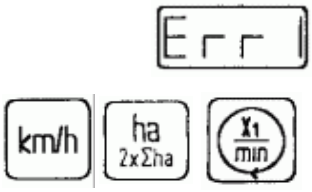
The monitoring systems are not active when the seed drill unit is in transport position (with raised seed drill unit and/or marker arms).

7.1) Sowing shaft alarm

The sowing shaft monitoring system controls the turning of the sowing shaft. (Please refer to sect. 5.1.4 for information on how to activate sowing shaft monitoring).

A sensor receives impulses from a transmitting device on the sowing shaft. If 10 seconds passes without an impulse being received (with the unit in operating mode), visual and acoustic alarm signals are activated.

Acoustic alarm = intermittent sound
Visual alarm = <**Err1**>



The alarm can be stopped by pressing one of the green display keys, but will nevertheless be reactivated if the marker arms are operated or the machine is raised.

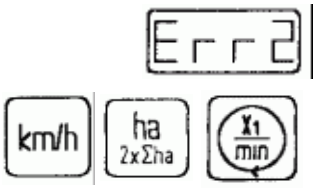
In the event of a fault occurring that cannot be dealt with immediately (e.g. a faulty sensor), it is possible to disable the monitoring system completely as a temporary measure, until the fault can be rectified. (Please refer to sect. 5.1.4 for details on how to disable sowing shaft monitoring).

7.2) Hopper level alarm

The hopper level monitoring system controls the amount of seed in the hopper. (Refer to sect. 5.1.5 for details of how to activate hopper level monitoring).

The level display receives a sensor signal when the quantity drops to a certain level, activating an acoustic and visual alarm signal.

Acoustic alarm = intermittent sound
Visual alarm = <**Err2**>

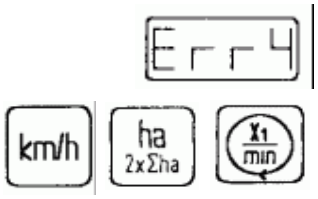


The alarm can be stopped by pressing one of the green display keys, but will nevertheless be reactivated if the marker arms are operated or the machine is raised.

In the event of a fault occurring that cannot be dealt with immediately (e.g. a faulty sensor), it is possible to disable the monitoring system completely as a temporary measure, until the fault can be rectified. (Please refer to sect. 5.1.5 for details on how to disable hopper level monitoring).

7.3) Fan unit alarm

The fan unit monitoring systems controls the turning speed of the fan unit. (Please refer to sect. 5.1.7 for details on how to activate fan unit monitoring). A sensor receives impulses from the fan unit shaft at a rate of one impulse for each turn of the shaft. The seed drill monitor uses this data to calculate fan unit turning velocity in rpm, and compared this value to the preset target speed. An acoustic and visual alarm is activated whenever the detected speed deviates by more than **500** rpm either way from the preset value.



Acoustic alarm = intermittent sound
Visual alarm = <**Err4**>

The alarm can be stopped by pressing one of the green display keys, but will nevertheless be reactivated if the marker arms are operated or the machine is raised.

In the event of a fault occurring that cannot be dealt with immediately (e.g. a faulty sensor), it is possible to disable the monitoring system completely as a temporary measure, until the fault can be rectified. (Please refer to sect. 5.1.7 for details on how to disable fan unit monitoring).

8) Configuring for machine type and local language

The Multitronic II seed drill monitor can be operated with both the MULTIDRILL range of mechanical seed drill machines and the TURBODRILL range of air-operated units.

The menus can be configured to appear in English, German or French.

The seed drill monitor is supplied factory-adjusted for the corresponding machine, but the user can change these parameters at any time:

Remove the power supply plug from its socket

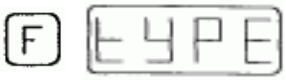
With the **F** key pressed, push the plug back into the socket.

The display will show <**tYPE**> for the corresponding type of machine

Release the **F** key once more

Press the **F** key again to activate machine type configuration.

Use arrow keys **A** or **V** to select machine type **MULTIDRILL ME/MEL** (display <**E-EL**>)



and press the **F** key to save. (See sect. 5.1.7)
The display will show <**tYPE**> once more

Use arrow keys **A** or **V** to activate local language configuration (and to display <**nAt**>)

Press the **F** key to activate the language selection feature.

Use arrow keys **A** or **V** to select the desired language

English	Anzeige <**EnGL**>
French	Anzeige <**FrAn**>
German	Anzeige <**EnGL**>

Press the **F** key to save the selected language. (See sect. 5.1.7).
The display will show <**nAt**>once more

Configuration is now complete. Press any one of the green display pushbuttons to leave the menu.