

JUNKKARI SIMULTA



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JUNKKARI OY
62375 YLIHÄRMÄ FINLAND
TEL. +358-(0)6-4835111
Fax +358-(0)6-4846401

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2. FOR THE READER

We wish you every success in your profession.

We would ask you to read through the instructions contained in this booklet and acquaint yourself with your machine, its principles of operation and the maintenance schedules all points which will affect operational safety and uninterrupted operation during the busy sowing seasons.

It is imperative that each and every specific point raised in this manual be fully understood and that the instructions regarding the machine's operation be complied with. Should any doubts arise, please contact your Dealer.

We also hope that you will kindly return the Certificate of Warranty after having acquainted yourself with the instructions of this manual.



2.1 WARNING SIGN

This sign will be used throughout the manual to indicate any operation, which might constitute a threat of injury to the operator or to any person close to the machine.

This sign is also used to indicate any threat of danger to the environment or property while the machine is performing a specific operation.

3. TECHNICAL SPECIFICATIONS

	S3000	S4000
Working width, cm	300	400
Row spacing cm	12.5	12.5
Hopper capacity		
- seed maximum	4470	5960
- fertilizer minimum	0	0
- seed minimum	1900	2530
- fertilizer maximum	2900	3860
Filling height, cm	202	202
Tyres	7.50-16" 6ply	7.50-16" 6ply
Weight, unloaded, kg	4673	6230
Overall width, cm	349	449

STANDARD EQUIPMENT

-Electronic areal meter and hopper level alarm sensors	*	*
-Computer controlled tramlining	*	*
-Fertilizer sieves	*	*
-Foot bridge and ladder	*	*
-Automatic rear harrow	*	*
-Lighting equipment	*	*
-Drive computer (Wizard)	*	*
- Front end top link adj. cylinder	*	*

OPTIONAL EQUIPMENT

-Small seed box / start-up fertilizer rationing unit	*	*
-Row markers	*	*
-Disinfectant treatment kit	*	*
-Remote control kit (fertilizer)	*	*
-Drive computer (Expert)	*	*
- Wheel track packer	*	*



4. SAFETY INSTRUCTIONS



4.1 GENERAL SAFETY INSTRUCTIONS

- **CLOTHING:** Always use well-fitting clothing for the sake of safety during operation of the machine.
- **OPERATION:** Acquaint yourself fully with the attachment, controls and operational principles of the machine before starting to operate it.
- **WARNING LABELS:** Always comply with all warning labels attached to the machine at various points.
- **SHIELDS:** The machine must have all its shields and covers in place before you attempt to operate it.
- **ATTACHMENT TO TRACTOR:** Exercise special caution when attaching the implement to or when

detaching it from the tractor.

- **HITCH LOAD:** Always note the maximum load limits on the draw bar or on the tractor hitch.
 - **SUPPORT BRACKET:** There is a danger of crushing when installing the support bracket.
 - **PARKING:** Ensure that the machine cannot move while parked.
 - **SAFETY DISTANCE:** The machine employs certain components which, due to the nature of the machine's operation, cannot be fully shielded. A safe distance from these working parts must always be maintained. The operator must also take care that no outside person(s) can approach these components during the machine's operation.
 - **OPERATION:** No outsiders must be allowed to be near or on top of the machine while it is running.
1. Never go into the space between the machine and the tractor when the machine is either being lifted up, lowered down or being transported around.
 2. Never bend under or lean over the top of a machine which is being supported above the ground by tractor hydraulics only.
 3. Ensure each time before taking the machine into use that it has been correctly attached to the tractor and that all its protective shields are in place.
 4. Before starting to move the machine, always check that all outside persons are within a safe distance away from it.
 5. Inspect the machine after each operating run, especially its hitching and other connection points.
 6. In case the machine is fitted with disinfectant treatment applicator, ensure that the instructions given by the manufacturer of the disinfectant are followed throughout the operation.
 7. Extra seed or fertilizer must not be carried on top of the machine covers or on the foot board.
 8. Never overload the drill. Acquaint yourself with partial emptying techniques of large bulk sacks.
 9. Be careful not to damage the covers with freely swinging large bulk sacks while lifting them.

4.2 TRANSPORTING AND MOVING THE MACHINE

The maximum towing speed for the drill is 30 kph (18.7 mph).

1. Always comply with the highway code while transporting a towed machine on public roads.
2. Check and install all necessary equipment required for transporting on public roads, such as lighting accessories, reflectors and the warning triangle denoting a slow moving vehicle.
3. Check the allowed axle loads, total loads and the overall transport dimensions.
4. All equipment coupling the tractor and implement together for transportation of the latter, e.g. chains, draw bars etc., must be installed in such a manner that no unintentional movements cannot affect their positions or functions either during transport or in operating positions.
5. Towed or mounted implements and extra weight on the tractor can influence its behavior during transportation, especially its steerability and brakeability. It is therefore important that both steerability and brakeability be retained at all times.
6. No passengers must be allowed to ride on the machine.
7. The machine must be lifted only from lifting points marked by the labels on the machine.
8. Use only approved lifting slings and chains for lifting, and check their condition before attempting a lift.
9. If the machine is transported e.g. on a platform, ensure that it is securely fastened down using, for example, suitable straps, slings or chains.
10. If a forklift truck is used to lift the machine, take every precaution to keep the machine balanced on the lifting forks and ensure that there is no danger of the machine falling down.

4.3 MAINTENANCE AND REPAIRS

1. Before attempting any cleaning, lubrication, fitting or adjustment of the machine, always make sure first that the tractor PTO is disengaged and the tractor engine switched off. As further precaution, remove the tractor ignition key from the starter switch to prevent any unintentional starting of the tractor or the implement.
2. Always support the implement adequately before starting any servicing on it. *Always use the machine service supports when adjusting the working depth from the support wheels.*

4.4 HYDRAULICS

The maximum pressure in the hydraulic system is 210 bar.

1. High pressure is induced into the machines hydraulic system after it is coupled to the tractor system. A jet of high-pressure hydraulic oil will penetrate skin and cause grave injury. A danger of injury exist even when looking for eventual oil leaks.
2. Handle oil hydraulic components and parts with extreme care. The nature of the equipment will always present a danger of cuts or crushing action.
3. The hydraulic couplings must not be detached while the machine is supported by hydraulics only, because that way the system will be left pressurized.
4. When connecting the machine's hydraulic system to the tractor system, both systems must be unpressurized.

PROTECTIVE MEASURES AGAINST OILS AND GREASES

1. Always use suitable protective clothing and oil-proof gloves when handling oil or grease.
2. Avoid direct skin contact with oil or grease, as these may cause skin injury.
3. Never use oil or grease to clean off dirt from skin. These substances may contain tiny metal particles which can cause cuts in the skin, further aggravated by the action of the oil.
4. Follow the handling and safety instructions given by the manufacturers of the lubricants.
5. Synthetic oils are, in many cases, corrosive and cause severe irritation of the skin.

WASTE OIL

1. Waste oil must be collected into a suitable container and taken to a collection center for proper disposal compliant with national regulations.

ACCIDENTS

1. If oil is spilled on the ground, it must be prevented from spreading and the oil must be collected by absorption, for example, into peat.
2. Should oil or grease cause a skin injury contact the nearest physician at once.

4.5 CLEANING THE MACHINE

1. The seed and fertilizer drill must always be cleaned before changing to another type of seed or fertilizer.
2. In case the machine is stored over night or a long period of rain, the fertilizer hopper has to be emptied and feeding rolls must be cleaned from any residual material by moving the feed rate adjustment from one extreme position to the other.
3. Do not spray water to electric parts.
4. If any detergent is used, always ensure its suitability and follow manufacturers instructions.

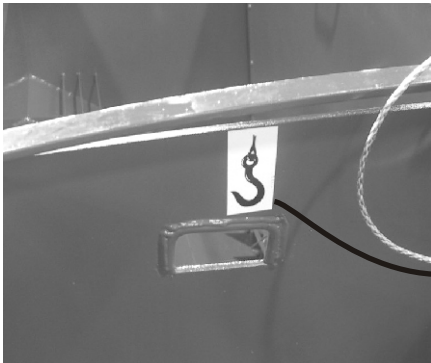


NOTE: THE MACHINE IS INTENDED TO BE OPERATED BY A SKILLED FARMER, THEREFORE ITS USE REQUIRES ADEQUATE GENERAL KNOWLEDGE AND SKILLS OF AGRICULTURAL PRACTICES. USE LARGE HOPPER VOLUMES REASONABLY. ALWAYS CONSIDER OPERATING WITH PARTLY FILLED HOPPERS IN EXTREMELY DAMP CONDITIONS.





5. WARNING LABELS, SAFETY COMPONENTS AND SERIAL NO. PLATE



LIFTING POINT

NOTE: THE MACHINE HAS TWO LIFTING LUGS, AND IT MUST ALWAYS BE LIFTED FROM BOTH SIMULTANEOUSLY !

SERIAL NUMBER PLATE

1. Year of attachment of the CE-plate
2. Machine model
3. Serial number and year model
4. Machine weight w/o accessories
5. Manufacturer



DO NOT GO UNDER THE MACHINE

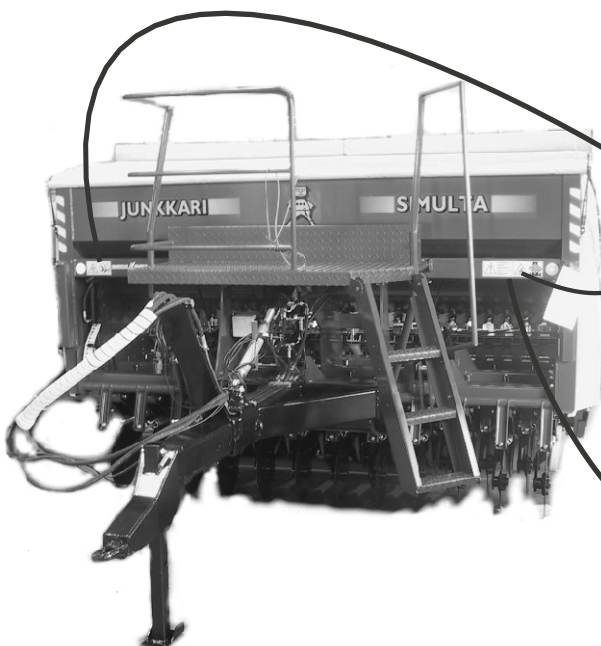


DANGER OF CRUSHING



NO PASSENGERS ALLOWED

HUOM. / OBS. / NOTE
 Kiristä pultit 3 tunnin ajon jälkeen.
 Spänn bultarna efter 3 timmar körning.
 Tighten bolts after first 3 hours of running.



DO NOT GO UNDER THE MACHINE



Lue käyttö- ja turvallisuus-ohjeet aina ennen käyttöönottoa.
 Läs bruksanvisning och säkerhetsföreskrifter innan den nya maskinen tas i bruk.

Become familiar with the owners manual and safety instructions before starting to operate this machine.

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5.1 REFLECTORS AND LIGHTING EQUIPMENT

REFLECTORS AND WARNING STRIPES

Towed implements must be fitted with triangular, E-approved red reflectors at the rear end. (Fig. 3)

At the front the reflectors should be colored white and the shape must not be triangular.

At the machine sides there should be yellow, E-approved, rectangular reflectors. The required amount of side reflectors depends on the length of the implement. (Fig. 4)

Towed machines must always be equipped with a slow moving vehicle warning triangle. (Fig. 2)

The implement sides must be fitted with red and yellow warning stripes, visible from the front and the rear of the machine. (Fig. 1)

This equipment is factory fitted to the basic machine body, or alternatively, at rear end of the optional small seed box. (Fig. 5)

LIGHTING EQUIPMENT

The Simulta drills come equipped with lighting equipment required by the road safety regulations.

Lighting equipment is attached to the machine body in basic Simulta Superseed-models. (Fig. 3) In case the machine is fitted with the optional small seed box, the lighting equipment must be attached to that. (Fig. 5)

The wiring connectors can only be connected in one way, so that no problems will arise, for example, when connecting the flashers. The wiring is fixed to the frame with plastic ties provided in the package.

The lighting harness is connected to the tractor's electrical outlet by a standard 7-pin socket connector.



Fig. 1



Fig. 2



Fig. 3

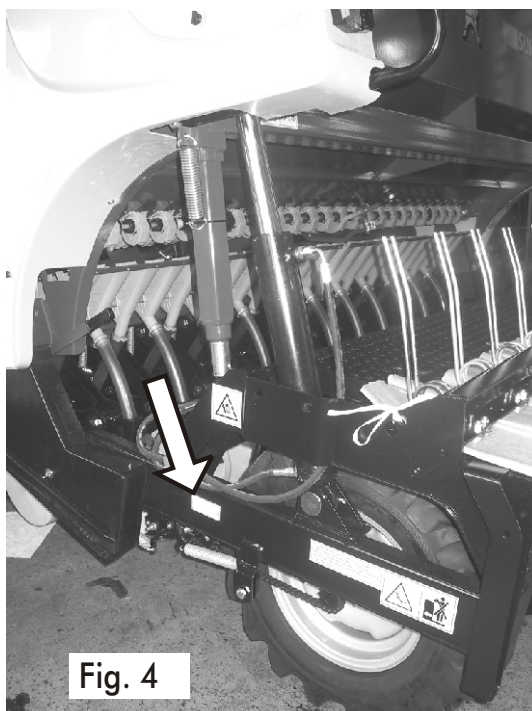


Fig. 4



Fig. 5

6. OPERATING ENVIRONMENT

6.1 OBJECTIVE OF DESIGN

The Simulta seed and fertilizer drill has been designed for simultaneous drilling of both seed and granulated fertilizer.

The Simulta drill prepares the seed bed, places the fertilizer in a beneficial position to the seed, sows the seed with row spacing of 12.5 cm and finally packs the soil on top of the seed.

With multiple selection of accessories and optional equipment available, the Simulta drill can be equipped to fit every special need and every farm.

6.2 APPLICATIONS

The basic equipped Simulta drill is ready for sowing cultivated and non-cultivated soil as it is. By using the available accessories and optional equipment the machine features can be altered to fit several different operational conditions and practices.

Each attachment and its appropriate use is introduced individually for each item later in this manual.



6.3 OPERATIONAL LIMITATIONS AND FORBIDDEN FORMS OF USE



OPERATIONAL LIMITATIONS

Limitations regarding the operator

The operator must not use the machine under the influence of narcotic substances, alcohol or strong medication. In case of difficult illness or serious handicap the physician in charge should be consulted for approval to operate the machine.

Operation of the machine by individuals lacking the necessary knowledge and skills and by individuals under the age of 15 years is forbidden.

Environmental limitations

Use of the machine should be avoided in extremely damp or very dry conditions where the proper moisture level for the seeds can not be confirmed.

Forbidden forms of use

The machine must not be operated within any protective areas around or along waterways nor in any areas reserved for nature preservation.

The machine must not be used for spreading liquids, flammable substances, sand or fibrous substances.

7. PRINCIPLE OF OPERATION

The Junkkari Simulta seed and fertilizer drill has an accurate, grooved push feeder mechanism, where the feed rate is adjusted by altering the effective length of the grooved rollers, either by the adjustment wheels on the right side of the machine or by a remote control unit which is available as an optional equipment. The feed mechanism is driven by the left side support wheels. The power is transmitted to the feed mechanism by a chain gearing. The seeds and the fertilizer granulates are flown through feed pipes down to the coulters which place them to the desired level in the ground. The working depth of the coulters can be adjusted either individually or by a central adjustment system. The support wheels serve also as packing roller wheels. The spiked wheel pattern prevents the soil from crusting. As basic equipment there is a rear harrow which spreads a layer of loose soil on top of the seed to prevent the ground moisture from rising to the surface and being evaporated by the sun.

8. MACHINE TRANSPORTATION, HANDLING AND STORAGE

(IMPORTER, DISTRIBUTOR, DEALER)

8.1 TRANSPORTATION

1. The delivery terms of the product are ex works, unless specified otherwise.
2. The buyer (importer) and the factory agree upon a date of the delivery when the product is ready for shipment.
3. The factory will arrange the loading of the product on a transport vehicle at the factory premises.
4. The transport agency shall be responsible for the product for the period of transportation from the factory to the buyer.

8.2 HANDLING

1. The product must be handled in the careful manner which is customary in handling all agricultural machinery, without causing any damage to the product.
2. No other products must be loaded on top of the machine package.
3. The factory will package the product carefully for shipment.
4. The transportation attachments must remain attached at all times during the handling of the product.

8.3 STORAGE

1. The machine must be shielded from direct sunlight and rain and stored in its wheels with coulters lifted from the ground.
2. When stored outdoors, check periodically that there is no water or snow left standing either on top or inside the machine.
3. The machine must always be stored indoors for any long-term storage periods.



8.4 SPECIAL SAFETY NOTES ON MACHINE TRANSPORTATION



1. Never attempt to lift the machine from any other point than those clearly marked for lifting. (Inside the machine, on the separation wall).
2. Ensure before lifting the machine, that the rear wheels, which are supported by the hydraulic system, are not let to drop down loosely. (There has to be pressure in the supporting hydraulic cylinders and the hose ball valves have to be closed).
3. Ensure that the lifting device is adequately efficient and safe and that no there exists no danger of the machine overturning or falling down.
4. The machine must never lifted on forklifts, but solely by flexible slings or chains.
5. Always use only approved slings or chains for lifting.
6. Always check the condition of the slings and chains before lifting.
7. Always check the lift/reach capacity of the lifting device.
8. The machine must always be kept securely tied down to the platform during transportation.
9. When lifting the machine take care of the danger of swaying. Avoid all sudden movements.

9. INTRODUCTION OF USE

9.1 PREPARATIONS PRIOR TO OPERATION

Unless otherwise specified, the customer is responsible for other preparations necessary to bring the machine into an operative condition. If the product be transported in a container, then the importer or its representative is responsible to bring the machine up to standard condition before it is delivery to the customer.

The customer shall also attend to the assembly of any optional equipment unless otherwise specified.

The optional equipment can be factory-assembled with the assembly costs added to the price of the option in question.

9.2 DELIVERY PACKAGE

The machine with all its equipment is packed in a single package for a standard delivery. The machine is packed inside protective plastic sheeting and the following parts are included in the package:

- Operator's manual.
- Fertilizer sieves (4 off) inside the fertilizer hopper.
- Lighting equipment ready-mounted on the machine.
- Calibration test handle inside the fertilizer hopper.
- Slow Moving Vehicle warning triangle assembled in its place.
- Drawbar ass'y assembled in its place.
- Top link assembled in its place.
- Rear harrow frame attached to foot board cover, harrow lift springs tied down in their positions, harrow arms complete with adjusting screws inside the fertilizer hopper and mounting bolts screwed down into the machine's arm.
- Hopper canvas cover at its place on top of the machine.
- Support for the hydraulic hoses assembled in its place.
- Support leg assembled in its place.
- The foot bridge and ladder assembled in its place.

9.3 ATTACHING TO A TRACTOR



READ THE SAFETY NOTES FIRST



The Junkkari Simulta Superseed-models are coupled into the tractor's rear towing hook (ISO 6489/1) or to an optional roller attachment, which in turn is attached to the tractor lower links.



TO AVOID DAMAGING THE DRILL, THE DRILL AND PACKER HAVE TO BE BOTH LIFTED UP WHEN REVERSING !

HYDRAULICS

To operate, the Simulta Superseed drills, as basic application, require two (2) double-acting and one (1) single-acting hydraulic valve blocks.

Only one double-acting and the single-acting valve block are in continuous use during the sowing. The other double-acting valve block is required for the coulter weighting adjustment, which is done before the sowing. In case the tractor in use is not equipped with adequate amount of double-acting valve blocks, the other valve block can be replaced by switching the places of the hoses for the coulter weighting adjustment.

The drill can also be equipped with an optional hydraulic row marker. The row markers controls and operations are handled from the tractor cabin by using the Wizard drive computer. The row markers are coupled to the drills hydraulics with a factory-assembled female bayonet in the drill lifting system hydraulic line.

The quick-release couplings (bayonets) are compliant with ISO 7241-1 standard.

ELECTRICAL CONNECTIONS

The lighting equipment is connected to the tractors 7-pin electrical socket connector compliant with the SFS 2472 / DIN ISO 3732 standards.

The Wizard multi-function drill control drive computer, which is basic equipment of the drill, is connected with connectors compliant with ISO/TR 12369 standard.

The nominal voltage used is 12V DC. The connecting procedures are dealt with in later chapters of this manual related to each separate piece of equipment.

Other electrical optional equipment for the machine is also available and these use the DIN ISO 4165 or ISO/TR 12369 standard connectors for their connection to the machine's electrical system.

CABLE CONNECTION

If the machine is equipped with a cable-operated remote control, the cable is attached to a suitable location in the tractor by means of a mounting support, delivered within the package. The location of the remote control should preferably be in the vicinity of other tractor controls so as to provide for best ergonomic conditions.

9.4 ASSEMBLY AND MOUNTING INSTRUCTIONS

1. Remove the protective plastic sheeting and the metallic and plastic ties.
2. Inspect the contents of the delivery package.

ATTACHING AND ADJUSTING THE REAR HARROW

The rear harrow attachment is mounted on the supports provided on either side of the bogie frame with M16 bolts and self-locking nuts. Tighten the nuts loosely to enable the harrow attachment to move freely. The harrow lift springs are attached to the lift chains in the manner that an equal no. of free links are left on each chain (refer to Figs. 2 and 3).

The harrow operating angle can be adjusted to suit prevailing conditions. The harrow support arms have 3 mounting holes each to provide three operating heights for the harrow frame.

This is necessary to limit the height of the lowermost operating position. It is also needed to enable the harrow arm to make contact with a stopper in the machine's frame, when stepping on the foot board on the harrow frame. The adjusting screws for altering the harrow's angle of advance must be tightened down properly ('A' in Figs. 4 and 5).

The adjustments to the harrow are best done on the field, right after the sowing adjustments. The principle used is that the harrow follows the machine smoothly spreading the loose soil left between the tyres over the hard-packed tread marks. The loose soil layer will prevent the humidity in the soil from rising to the top through the action of capillary flow and evaporating away. The optimum working depth for the harrow is approx. 2 cm (3/4") below the mean ground level of the field but always, however, kept above the seed bed level.

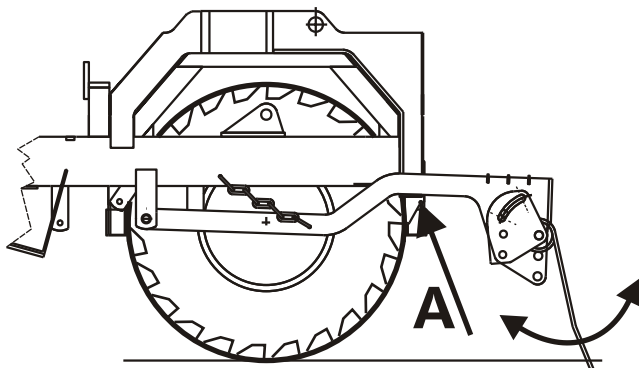
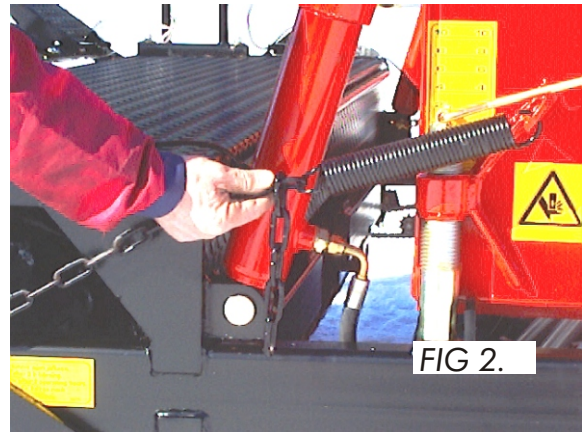


FIG 3.

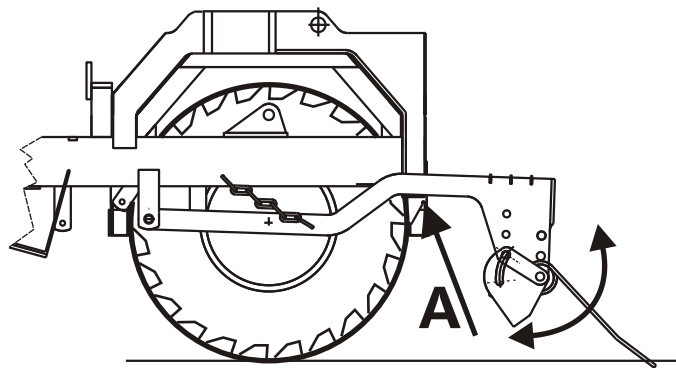


FIG 4.

LIGHTING EQUIPMENT

The lighting equipment is installed to the Simulta Superseed basic model drill at the factory.

THE HOPPER CANVAS COVER

The hopper canvas cover has been installed on the machine at the factory. The cover is attached into the middle of the hopper with screws (FIG 1.).



NOTE ! The hopper cover tie string must never be let hang loose inside the seed hopper, because of risk of getting winded around the mixer shaft and damaging the machine (FIG 3.). The tie string is tied to the machine body.

USAGE OF THE HOPPER CANVAS COVER

The hopper canvas cover must be fixed with the rubber fasteners to the machine body (Fig 2.), as well as the tie strings must be secured tightly to the machine body during moving of the machine, especially when transporting on public roads .

It is recommended to keep the hopper canvas cover over the hoppers during the sowing, because even a small amount of humidity in the fertilizer will hamper the drill functions.



Fig 1.

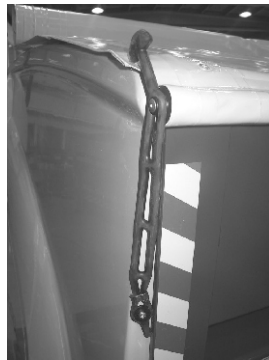


Fig 2.

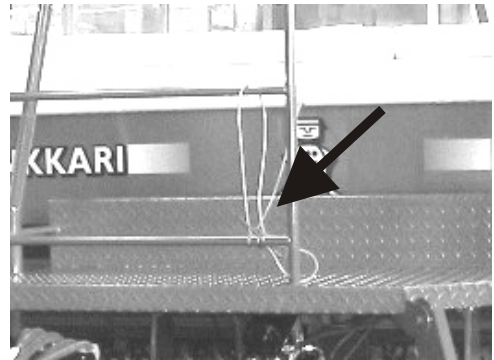


Fig 3.

ATTACHING THE SLOW MOVING VEHICLE WARNING TRIANGLE

The SMV warning triangle supplied with the machine package is mounted at the rear of the machine by means of the adhesive strips on the rear face of the triangle. The mounting surface must be clean to enable a lasting bond. Remove the protective covering from the adhesive strips and press the triangle against the hopper rear side plating. Do not touch the adhesive strips in order to keep the adhesive clean and to retain its adhesive properties. The triangle must be mounted at the far left of the rear end of the machine. It must be remembered that if the machine is equipped with a small seed box, the triangle must be mounted at the rear end of the box (refer to Figs. 1 and 2).

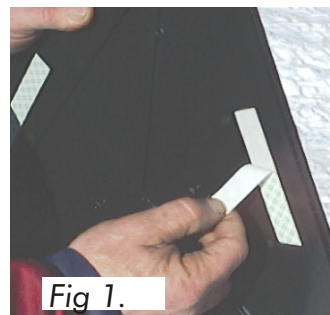


Fig 1.



Fig 2.

SUPPORT LEG AND HITCH ATTACHMENT

The drawbar ass'y consists of a drawbar frame, drawbar, hydraulic hose support and top link ass'y. The drawbar frame is attached to the machine with the attaching pins supplied. Top link is attached with pins.

The drawbar is inserted into the frame and is attached with a pin securing the drawbar and its frame to each other. The support leg is fitted to the drawbar. It is recommended to use an adequately efficient lifting device when fitting the support leg to the machine.

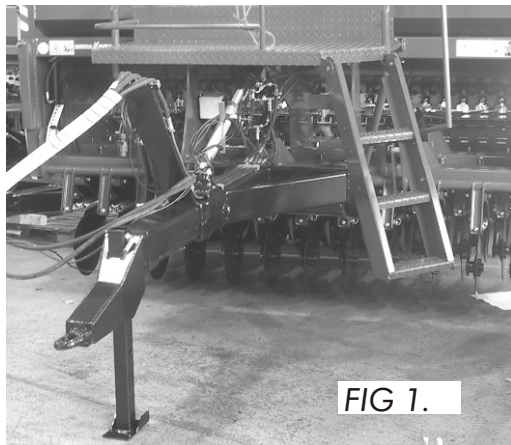


FIG 1.

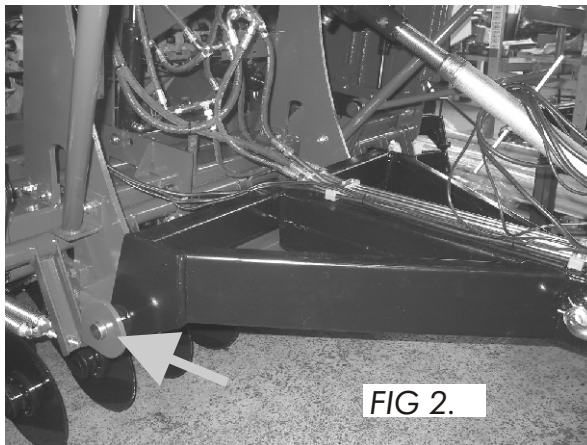


FIG 2.

HYDRAULICS

The hydraulic hoses are supplied complete with ball valves, which are used to stop oil flow through the lines. When the valve lever is turned into the direction of the hose, the valve is open. When the lever is turned crosswise to the hose, the valve is closed.



MOUNTING THE WIZARD MULTI-FUNCTION DRILL CONTROL DRIVE COMPUTER

The Wizard drive computer is ready-assembled to the drill at the factory. Unless otherwise specified, the customer is responsible for the mounting of the monitor to the tractor. There are alternative places introduced in the following pictures, where the monitor can be fitted in the tractor cabin. Generally it is recommended, that the monitor is mounted to a place near by other controls, when the ergonomic solutions of the tractor manufacturer are reclaimed.

The monitor is assembled to the tractor by using its own 3-joint mount. With 2 screws supplied in the package, the mount is fixed into a place adequately sturdy to hold the monitor properly on its place.

In addition to the data transfer cable, which is connected to the monitor, there is a power supply cable which is connected to the tractors electrical equipment plug. The equipment plug is compliant with ISO/TR 12369 standard, and it is very common in new tractors. The plug described in this standard is especially designed for demanding agricultural use.

In case there is no such plug in the tractor, it is recommended to obtain one to ensure troubleproof function of the equipment.

The most common reason for malfunction of electrical devices in agricultural machinery is a poor power supply plug.



9.5 DISCARDING THE PACKAGING MATERIALS

The wooden and cardboard packaging materials can be discarded by burning them or by taking them to a refuse dump. The PVC packaging materials (bags and plastic strings) must be discarded in the manner according to national law either by recycling or by taking them to a refuse dump.

9.6 TRACTOR BALANCE WEIGHTS

In order to make use of the full potential that the Simulta can offer you in the form of ease of operation and saving of time, it is imperative that it can be operated with full hopper loads. Always check before a sowing season that the tractor lift linkage is in good working order. Sometimes, particularly with smaller tractors, the tractor front end may prove too light, especially when operating with full hopper loads. In this case it is advisable to fit the tractor with front weights to ensure that approximately 20% of the tractor weight is maintained on its front axle.

10. ACCESSORIES

10.1 COULTER ASSEMBLY

The coulters assembly consists of the coulters and the coulters adjusting mechanism.

10.1.1 COULTERS

The coulters have a parallel arm, which is pivoted from the other end to the machine body and from the other end to the coulters body.

The coulters body is made out of rigid, thick special steel. There is an opener disc fixed to the front end of the coulters body, and at the rear of the coulters body there is the main coulters disc with its plastic support wheels to adjust the working depth.

All coulters bearings are pre-lubricated.

10.1.2 COULTERS ADJUSTING MECHANISM

The coulters adjusting mechanism consists of the hydraulically operated sowing method zone selection mechanism and the coulters spring weighting mechanism.

The hydraulically operated sowing method selection mechanism has two zones to select from, one for traditional seeding and other for direct sowing.

In the direct sowing-position the zone selection spring is in an angle to most efficiently draw the parallel arm of the coulters downwards (the zone selection body is on its lower position).

In the traditional sowing-position the force directed to the parallel arm is considerably lower than with the direct sowing, and when the coulters tries to rise off the ground, also the weight increases less (the zone selection body is on its upper position, fig. 1).

The sowing method zone selection is operated by three hydraulic cylinders, and it is controlled from the tractor cabin with one single-acting valve.



Fig 1.

The spring weighting mechanism is operated by two strong, single-acting hydraulic cylinders (Fig 1). The mechanism operates so, that when the cylinders are drawn in, the spring weighting increases. The increasing of the weighting can be followed from a scale, which is fitted to the mechanism frame (Figs 2, 3 and 4).

The spring weighting mechanism is designed so, that when the zone selection is in the direct sowing-position, the whole length of the hydraulic cylinders is available.

When the zone selection is in the traditional sowing-position, the cylinder output is not able to increase the spring weighting, because it is limited not to let the coulters weighting get too high.

This way the coulters weighting scale will never rise up to 10 on the traditional sowing-position.

The mechanism is also fitted with a relief spring for the sowing of cultivated soil, because the weight of the coulters itself is already enough, even too much, for the sowing of tilled soil. The relief spring reduces the coulters weighting in the beginning of the adjustment of the spring weighting by shortening the torque arm. The relief spring is passive and it cannot be adjusted.



MAXIMUM PRESSURE 210 BAR.

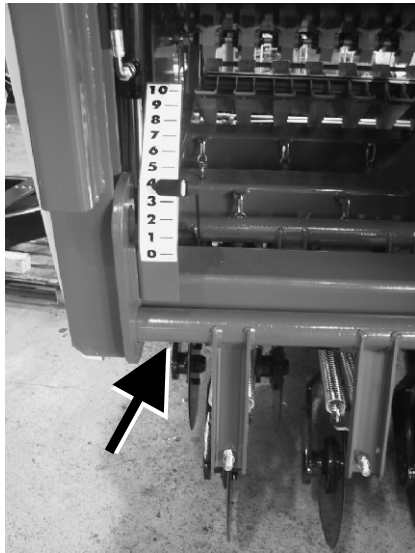


Fig 2. The zone selection in direct seeding-position, coulter weighting approx 3.5.

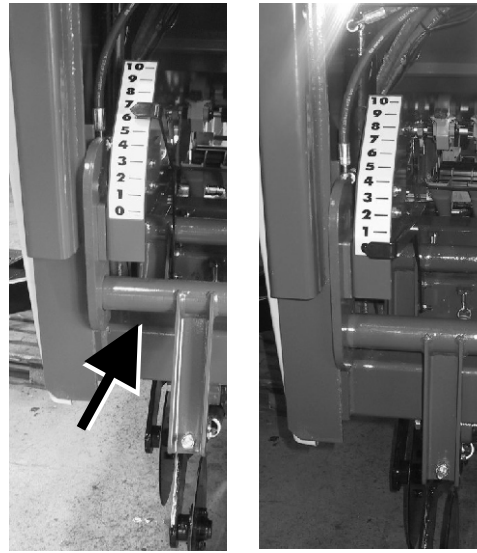


Fig 3. ja 4. The zone selection in traditional seeding-position, coulter weighting approx 6.5 and 0.

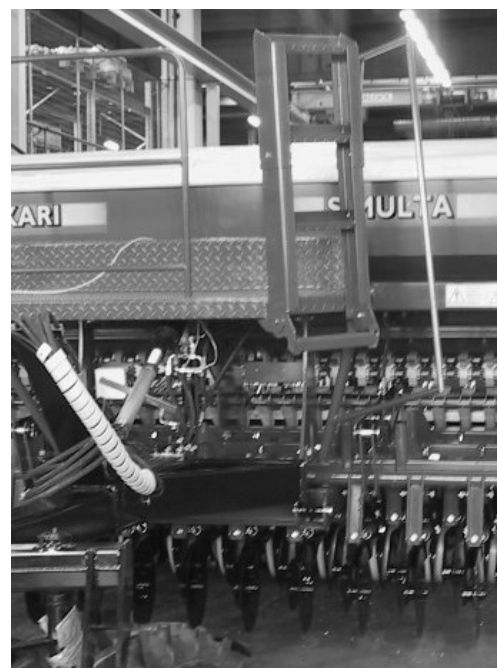
10.2 THE WORKING PLATFORM AND LADDER

The Simulta Superseed 3000- and 4000-models are equipped with a working/servicing platform and hinged ladder. The platform, including the foldable ladder, is assembled to the machine at the factory.

The ladder can be folded completely up during maintenance of the machine. The ladder has two hinges, in the middle and at the top (fig 5).

In case there are any optional tillage equipment to be installed into the front of the machine, the lower part of the ladder can also be removed altogether.

The ladder is recommended to be kept lowered during the seeding to facilitate the work.



10.3 DRIVE COMPUTER

Simulta Superseed-drills are equipped with a Wizard multi-function drill control drive computer as basic equipment. The Wizard includes the following features :

- Forward speed measurement
 - Area measurement, total and partly area, for example, area worked on one field
 - Hopper level alarms on both hopper sections
 - Fertilizer distribution shaft speed follow-up and alarm
 - Seed distribution shaft speed follow-up and alarm
 - Tramliner function

The tramliner function is designed to ease pesticide spraying later during the season.

The tramliner has four different methods to mark the tractor path for pesticide spraying :

- Symmetric
- Asymmetric to the right
- Asymmetric to the left
- 18-metre method

The drive computer can also be used to control the row markers, that are available for the drill as optional equipment.

Instructions for the use of the drive computer are later on in this book.

10.4 FEED MECHANISM

The feed mechanism is a grooved push feeder type, which enables the feed rate to be adjusted by altering the effective length of the feeder grooved rollers.

The feed mechanism is chain driven from the machine's L.H. side chain drive unit.

A stopper plate, located between the feed chamber and the hopper, enables the feed to be stopped at the chamber. By closing a part of the feeder mechanism with stopper plates, the machine can be used for sowing in narrow strips.

A curved bottom flap is located at the bottom of the feed chamber. The flaps will give in if a foreign object or a hard lump of fertilizer should enter the feed chamber.

The position of the bottom flaps can be adjusted by means of a lever at the center of the machine. The movement of the lever acts simultaneously on all flaps. For normal purposes the lever should remain in the second notch from the top (Position 1) but when sowing peas the bottom flaps must be opened by moving the lever into the third notch (Position 2). On the fertilizer side the normal operating position of the adjusting lever is in the second notch from the top (Position 1). If moved into the third notch position (Position 2), the feed rate will be increased by approximately 15%. The machine is emptied by pushing the lever completely down and by turning the feed mechanism manually with the handle provided.

10.5 REAR HARROW ATTACHMENT

The purpose of the rear harrow attachment is to loosen and to level the top soil above the seed row level. Additionally, the harrowing unit will spread loose soil on top of the hard-packed wheel tracks to prevent the moisture from reaching the top of the soil and thus minimizing the detrimental moisture evaporation. The rear harrow attachment is not designed to be used as a tilling implement and therefore its position must be adjusted so that it cannot interfere with the seed rows in the soil.

11. OPTIONAL EQUIPMENT

A large range of other accessories, not specified here, is available for Simulta drills to enable its operation in specific conditions. Your Simulta Dealer will provide the information about the items.

Each separate accessory item is supplied with its own printed assembling and attaching instructions. The instructions also cover a spare parts list for each accessory in case it is not included in the main parts catalogue supplied with this manual. It is advisable to attach any separate accessory parts list to the main parts catalogue for safe keeping.

12 OPERATION AND CONTROL OF THE SEED AND FERTILIZER DRILL



**READ SAFETY INSTRUCTIONS
BEFORE USING THE DRILL**



12.1 BEFORE A SOWING RUN

12.1.1 WORKING POSITION

Before the beginning a sowing run, the top link must be adjusted in the machine so, that the machine will go relatively straight in a chosen working depth, it is not necessary for the machine to be totally horizontal, because the coulters are supported by the coulters discs.

12.1.2 WORKING DEPTHT

The lowest area, which can be sowed still maintaining the sowing result even -even when the field surface is rough- has to be defined, when choosing the correct working depth. The coulters weighting must be the bigger the deeper there is to sow in the direct sowing method.

Refer to paragraph 12.3 Machine height and working position

12.1.3 COULTER ADJUSTMENT

The basic adjustment of sowing depth is done by adjusting the plastic coulters support wheel in relation to the coulters disc. This is done by removing the support wheel fixing pin from each coulters and moving the support wheel to desired position (figure 1.). The depth adjustment range is approx. from 0.5 cm to 6.5 cm deep.

When the basic sowing depth is adjusted by the support wheels, the coulters weighting is adjusted hydraulically so, that the support wheel only touches the ground very lightly, just to keep it rolling. As little spring force as possible is used.

The desired sowing depth is reached by weighting the coulters with a spring. There are two sowing method zones in the weighting adjustment range, the direct drilling method for non-tilled soil-zone and the traditional drilling method for tilled soil-zone.

Before switching from zone to another, the coulters weighting must be totally released.

The maximum weighting is not recommended to use on the traditional drilling method zone (The hydraulic system of an ordinary tractor can't even produce enough pressure to perform max. weighting).

The sowing depth increases steplessly by increasing the weighting. The adjustment can be followed from a scale at the front end the machine (figure 2). The weighting achieved with this system is 75-250kg in direct drilling, and 5-100kg in traditional drilling.

Each coulters can be individually adjusted by tightening or loosening the coulters weighting spring nut (fig 2). The individual adjustment doesn't have an affect to the basic adjustment of weighting. The individual adjustment is rarely needed, because the supporting area of the support wheels is quite large. The individual adjustment might be needed where the soil is packed and the penetrativity of the coulters has decreased, for example where the tractor wheel track goes. *The correct sowing depth can only be seen from the field.*

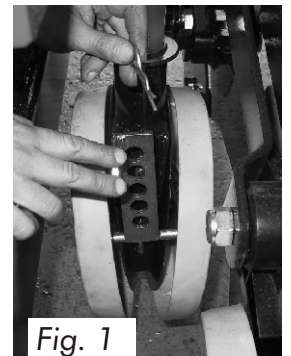


Fig. 1



Fig. 2

12.1.4 USE OF THE REAR HARROW ATTACHMENT

Use of the rear harrow is not recommended when performing direct drilling, if the field is heavily covered with crop residue or the herbicides are sprayed after the sowing. This is because the harrow will cover the developed weeds and the chemicals won't work.

The herbicides used nowadays are effective through the weeds chlorophyll and assimilation of the weeds, and it is recommendable to perform spraying 72 hours before sowing.

12.1.5 CHOOSING THE FEED RATES AND CALIBRATION TESTING

The feed rates are adjusted by turning the adjusting knobs located on the R.H. side panel of the machine. The scales, which provide the values to choose from, are the main scale on the adjusting knob locking latch and the circular scale on the outer face of each adjusting knob. A circular groove cut into the knob outer circumference determines the position of the knob in relation to the main scale. The sowing chart gives guide values for adjusting the feed rates. The columns in the chart indicate the feed volume per hectare and the rows indicate the related settings of the two adjustment scales. The lower, larger digits are the values on the main scale and the upper, smaller digits are the values on the circular scales on each adjusting knob (see Fig. 3)

The Sowing Chart is provided both on the machine's top cover and in this manual. The grain variety is first chosen from the lines in the diagram. The intersection of the required sowing rate from the vertical scale and the variety line determines the relative positions of the main and adjusting knob scales directly below the intersection point.

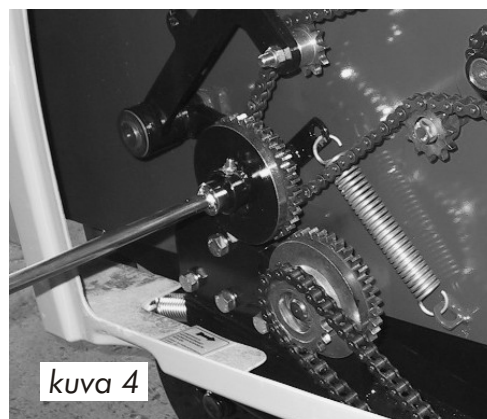
For example, suppose that barley is being sown at a required feed rate of 200 kg per hectare. The corresponding adjustment setting on the scales is then 4.7, i.e. 4 on the main and 7 on the knob scale. The adjusting knob is now turned so that the groove on the knob circumference is moved to position 4 on the main scale. The knob is then turned further until the position 7 on the knob scale is brought in line with the locking latch of the main scale.

A calibration test should always be run before the final decision on the required feed rate is done.

The calibration test is always done with the machine lifted up. The degree of cleanliness, the specific gravity value and even specific seed treatments affect the flow characteristics of the seeds within the feeding mechanism.

When compiling the Sowing Chart, a 5% allowance has been made for wheel slip due to the sinking of the tyres. The slippage value may in practice vary between 5-10% depending on the prevailing soil conditions. The calibration test must never be carried out on the basis of the reading given by the areal meter alone.

To perform the calibration test, turn the test handle placed to the end of the coupling shaft. (Figure 4.) The calibration test can be run separately for the seeds and for the fertilizer if so required. When testing the seed calibration rates, remove the pin from the end of the fertilizer shaft to stop the fert. shaft rotating when the test handle is turned (figure 5a). When the test is done to the fertilizer, the pin is removed from the seed shaft, and the seed shaft won't rotate.



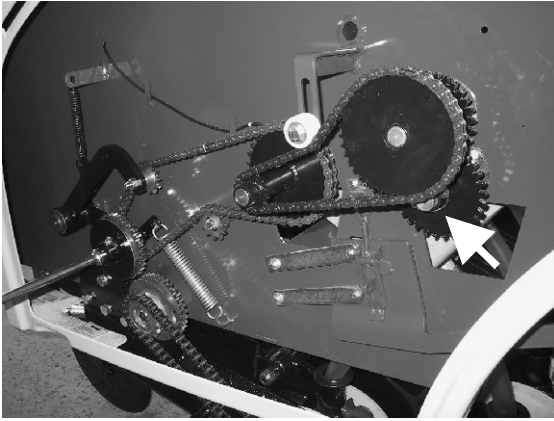


Figure 5a
Calibration test, seed side

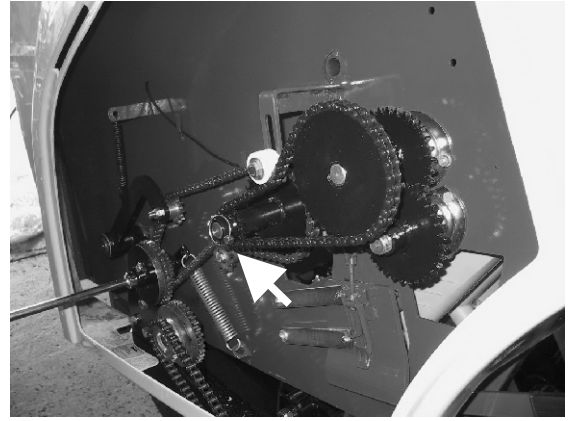


Figure 5b
Calibration test, fertilizer side

THE CALIBRATION TRAYS

To perform the calibration test, open the calibration tray locks from both sides of the machine and lower down the trays by pulling from the levers (figure 6a). Then place the trays to the grooves in the hoppers, to the desired side to test (figures 6c and 6d).

The calibration trays are stored in their own holder, between the hoppers, and are able to be pulled out when the hoppers are lowered down to the calibration test position (Figure 6b).



Figure 6a Hopper handle and locking system, identical on both sides of the machine



Figure 6b Calibration tray store / holder

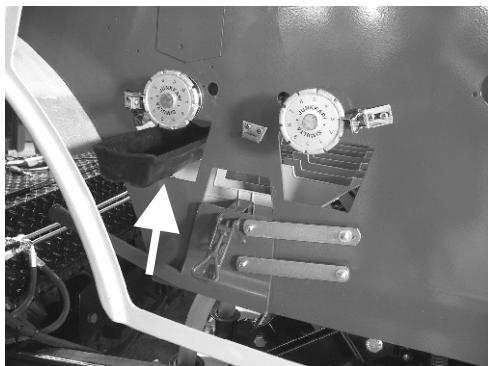


Figure 6c Calibration tray, seed

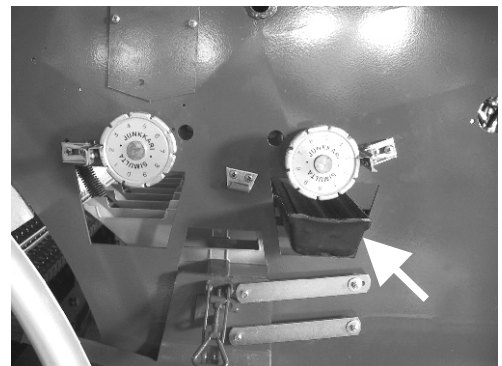


Figure 6d Calibration tray, fertilizer

When testing the fertilizer side calibration, the calibration trays are used in the same manner as when testing the seeds. The required feed rate is chosen from the Sowing Chart and the corresponding scale readings noted. Set the feed rate adjusting knob to the reading values thus obtained.

- Fertilizer side test (turning the coupling shaft by handle).

	turns./are
Superseed3000	21.2
Superseed4000	15.9

$a = 100 \text{ m}^2$ $ha = 10000 \text{ m}^2$

The amount of seed and fertilizer collected in the test trays is weighed and the resulting weights multiplied by one hundred. The resulting figure represents the amount of material the machine will sow to one hectare with that particular adjustment. The figure thus obtained is compared with the feed rate in the Sowing Chart and a possible corrective action is then taken by turning the adjusting knob. Always adjust from smaller value settings upwards to higher values. This method will counteract any possible backlash in the adjusting knob threads. An alternative method to the calibration test on the seed side is to make a trial run with the calibration trays in place. A trial run will eliminate also any slippage occurring due to soil conditions or tyre pressures. The resulting figure is the exact feed rate value corresponding with the prevailing conditions.

SMALL SEED SOWING FROM THE MAIN HOPPER

Small seed can be sowed with Simulta Superseed when the feed shaft speed is decreased. This is done by moving the seed shaft sprocket to the small seed position.

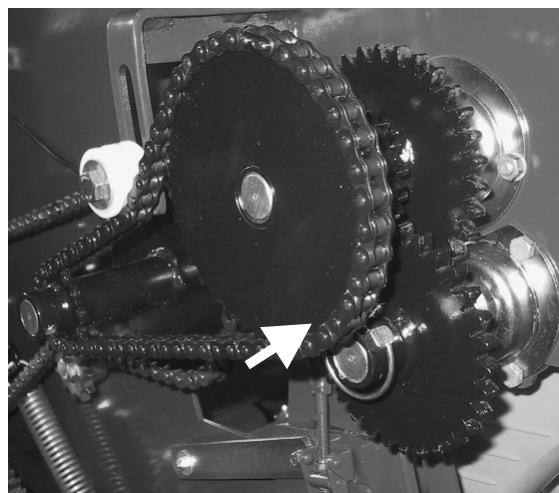
SETTING THE SPROCKET TO THE SMALL SEED SOWING POSITION

Lift the machine up. Remove the pin from the end of the seed shaft, move the sprocket to the small seed position (outwards) and fix it to the outer hole with the pin. If necessary, turn the gear system with the handle or by hand from the coupling shaft to move the tothing to right position. Small seed sowing uses the bigger sprocket on the feed shaft.

The outer sprocket of the seed shaft is on its normal position when it is locked to the inner position with the pin, and the smaller sprocket is connected to the feed shaft sprocket.

CALIBRATION TEST TO THE SMALL SEED

The calibration test to the small seed is done by removing the pin from the end of the fertilizer shaft (to stop the fert. shaft rotating when the test handle is turned). Perform the calibration test as usual, with the sprocket on the small seed position, by turning the test handle.



7. Small seed sowing position of the sprocket

Esimerkki kiertokokeesta:

Halutaan kylvää kauraa 210kg/ha ja lannoitetta 500kg/ha

Example:

210 kg barley and 500 kg of fertilizer to be sown on 1 hectare

SEED:

1. Fill up the seed hopper with at least 100 kg (220 lbs) of seed.
2. **Lift up the machine.**
3. Remove the drive chain cover.
4. Remove the sprocket retaining linchpin.
5. Check the Sowing Chart to ascertain the adjustment scale readings for a feed rate of 210 kg/ha for barley. The main scale reading will be 6 and the knob scale reading 3.
6. Adjust the feed rate by turning the adjusting knob on the L.H. side of the machine. Bring the circumferential groove to setting 6 on the main scale and after this, Turn the knob further for 3 more notches to obtain the reading 3 on the knob scale. Always adjust from zero value upwards.
7. Lower the feed hoppers with the levers on the sides of the machine to the test position. Place the test trays to the groove on the hoppers, below the seed feed chambers. Check that no seeds can bypass the test trays.
8. Attach the calibration test handle into the end of the coupling shaft and turn the handle for a few turns. Check that the seeds pass through all of the feed chambers. Empty the trays by tipping the collected seeds back into the hopper. Replace the trays in their test position.
9. Rotate the handle at a speed of 1 turn/sec. See table for required turns.
10. Weigh the seeds collected in the trays after the completion of turns.
11. If there should be a marked difference between the value given in the Sowing Chart and the value obtained from the test, re-adjust the settings and re-run the test.

FERTILIZER:

1. Fill up the fertilizer hopper with at least 100 kg (220 lbs) of fertilizer.
2. **Lift up the machine.**
3. Remove the drive chain cover.
4. Remove the sprocket retaining linchpin.
5. Check the Sowing Chart to ascertain the adjustment scale readings for a feed rate of 500 kg/ha for fertilizer. The main scale reading will be 5 and the knob scale reading 6.
6. Adjust the feed rate by turning the adjusting knob on the L.H. side of the machine. Bring the circumferential groove to setting 5 on the main scale and after this, turn the knob further for 6 more notches to obtain the reading 6 on the knob scale. Always adjust from zero value upwards.
7. Move the test trays over to the fertilizer feed side. Check that no fertilizer can bypass the trays.
8. Attach the calibration test handle into the end of the coupling shaft and turn the handle for a few turns. Check that the fertilizer passes through all of the feed chambers. Tip the collected fertilizer from the trays back into the hopper and refit the trays back in place.
10. Weigh the fertilizer collected in the trays after the completion of turns.
11. If there should be a marked difference between the value given in the Sowing Chart and the value obtained from the test, re-adjust the settings and re-run the test.

PLEASE NOTE THAT THE VALUES GIVEN IN THE SOWING CHART ARE FOR GUIDANCE ONLY, DUE TO VARIATIONS IN THE COMPOSITION OF THE SOWED MATERIALS, THEIR TREATMENTS ETC.

TRIAL RUN FOR CALIBRATION

To obtain a more accurate result than the manual calibration test can produce is to make a trial run. The run will also take into account the actual wheel slip and any changes in the feed rates due to the machine vibrations occurring during running.

Carry out the trial run as follows:

1. Open up the fertilizer feed flow.
2. Adjust the machine as per instructions for the calibration test.
3. Measure the machine's traveling distance required for completing the sowing of an area of 100 sq.m (1 are) - i.e. the travel distance for the particular drill model.

Travel distances for different working widths per 1 are:

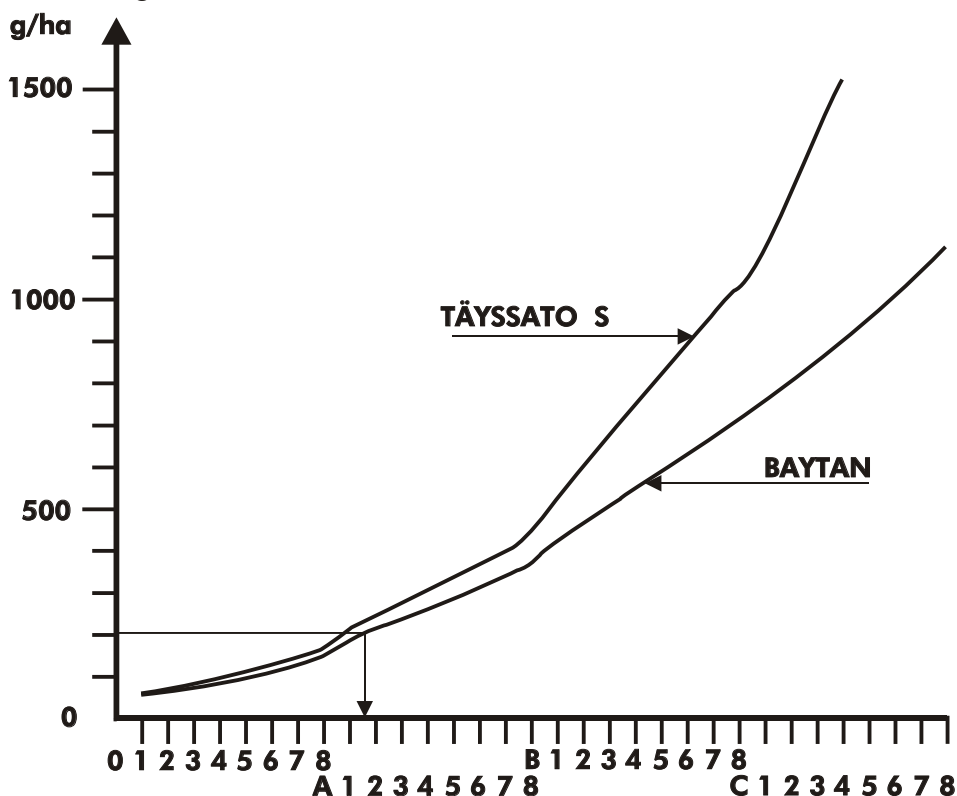
Superseed3000	33.3 m
Superseed4000	25 m

4. Check first that the seeds are passing out unobstructed through each feed chamber by driving outside the test for about 10 meters (33 ft) with the drill in its proper working position.
5. Empty the trough back into the hopper.
6. Lower the machine into working position and carry out the test run over the measured distance.
7. Measure the amount fed into the trough multiplying the resulting value by 100 to obtain the weight of seeds required in kilograms per hectare.
8. Should any checking be required for, refer to the Chapter 'Calibration Test'.
9. Do not forget to re-open the fertilizer feed mechanism and remove the test trays after the field test, and return the hoppers back to the sowing position..

SPECIAL NOTIFICATION : USE OF THE DISINFECTANT TREATING UNIT

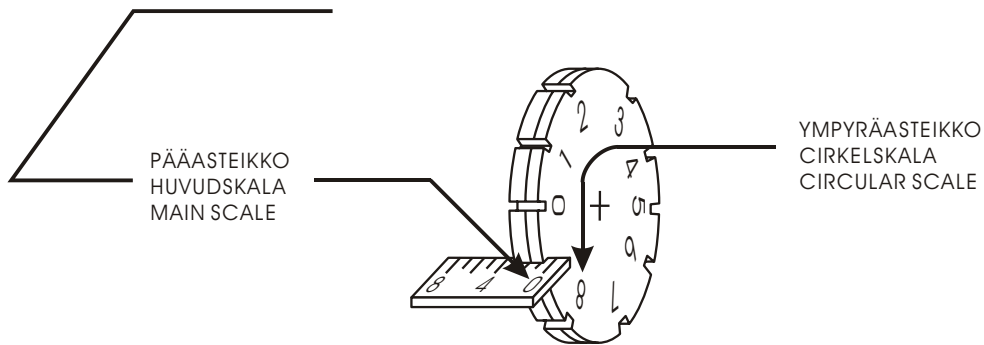
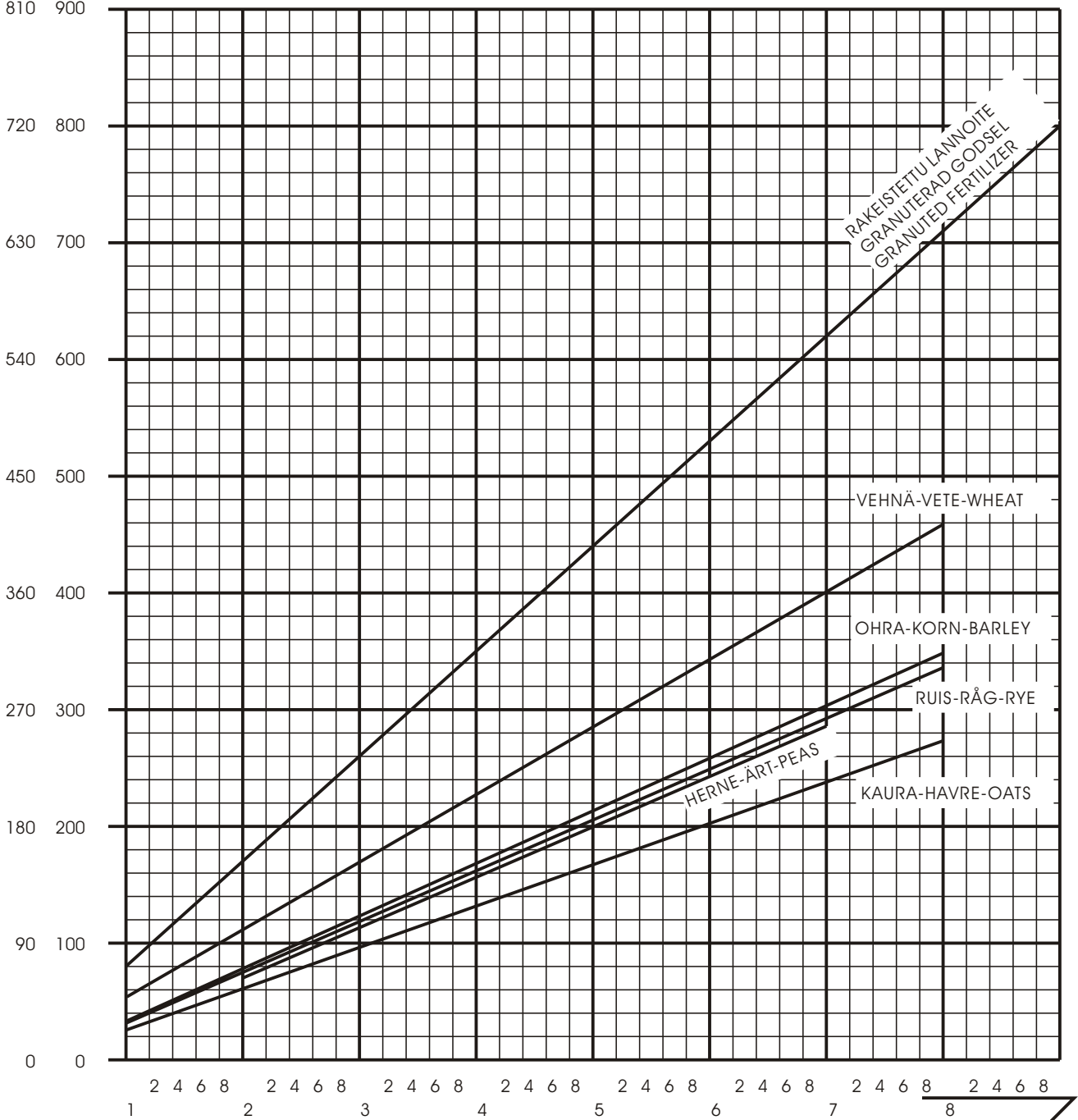
It must be noted, that when the Junkkari Disinfectant Treating Unit is used with the Simulta Superseed, the Disinfectant Unit will supply only half of the amount mentioned in the Disinfectant Unit manual chart.

See the chart below for correct adjustments with different disinfectants. Acquaint yourself with care to the Disinfectant Treating Unit manual.



lbs/ acre
kg/ ha

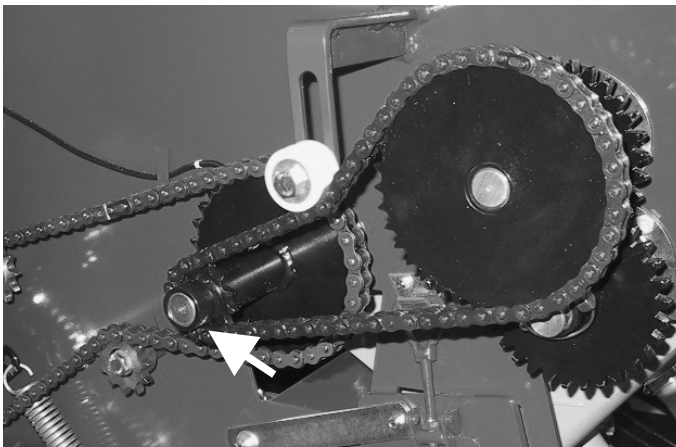
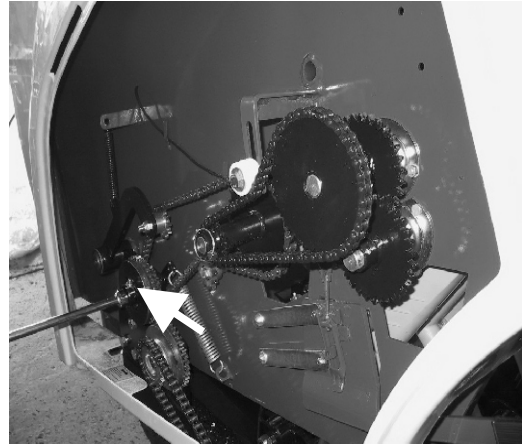
SOWING CHART



THE VALUES SHOWN IN THE SOWING CHART ARE FOR GUIDANCE ONLY DUE TO THE VARIATIONS IN THE SEED AND FERTILIZER QUALITIES. THE SOWING RATES CAN BE ASCERTAINED BY CARRYING OUT A CALIBRATION TEST. WHEN COMPILING THE SOWING CHART, A 5% ALLOWANCE HAS BEEN MADE FOR WHEEL SLIP. THE SLIPPAGE MAY IN PRACTICE VARY BETWEEN 5-10% DEPENDING ON THE PREVAILING SOIL CONDITIONS.

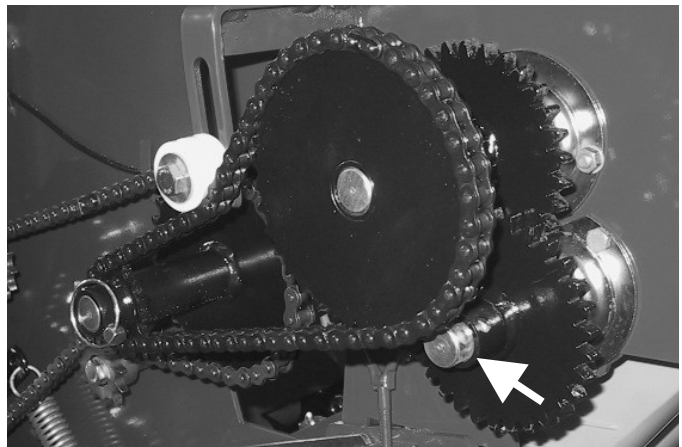
12.2 CALIBRATION TEST

Attach the test handle here, to the end of the coupling shaft.



Calibration test, seed

Remove pin from the fertilizer shaft.
Fertilizer shaft will not rotate.



Calibration test, fertilizer

Remove pin from the seed shaft.
Seed shaft will not rotate.

ORDINARY SOWING

$$a = 100\text{m}^2$$

$$ha = 10.000\text{m}^2$$

Calibration test

	Turns/100 m ²
Superseed3000	21.2
Superseed4000	15.9

BOTTOM FLAP POSITION

Fertilizer	1 - (2)
Grain	1
Peas	2

SMALL SEED SOWING FROM THE MAIN HOPPER

Calibration test turns

Turns/100 m²

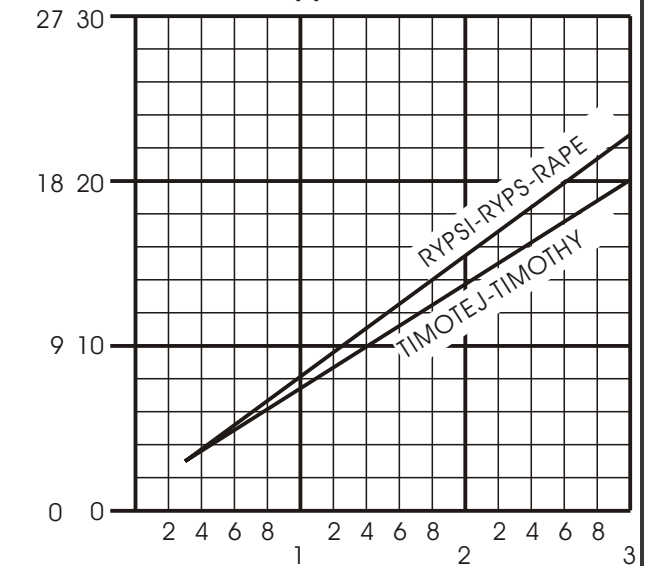
Superseed3000	21.2
Superseed4000	15.9

Bottom flap position **0**

$$a = 100\text{m}^2$$

$$ha = 10.000\text{m}^2$$

SMALL SEED SOWING CHART from the hopper



SMALL SEED SOWING from the small seed box (optional equipment)

Bottom flap position **0**

Sprocket Z37

Calibration test turns

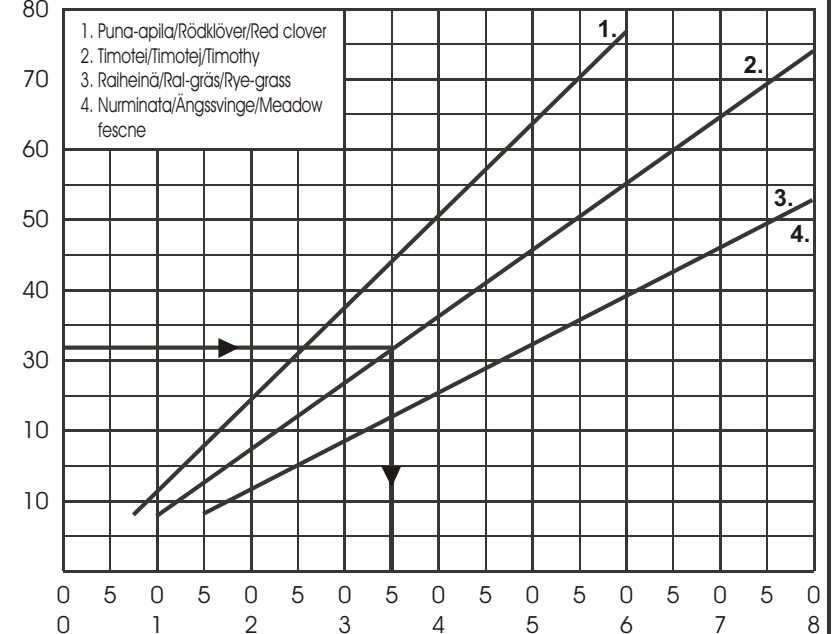
Small seed box

Turns/100 m²

Superseed3000	2.6
Superseed4000	2.0



SOWING CHART for small seed box

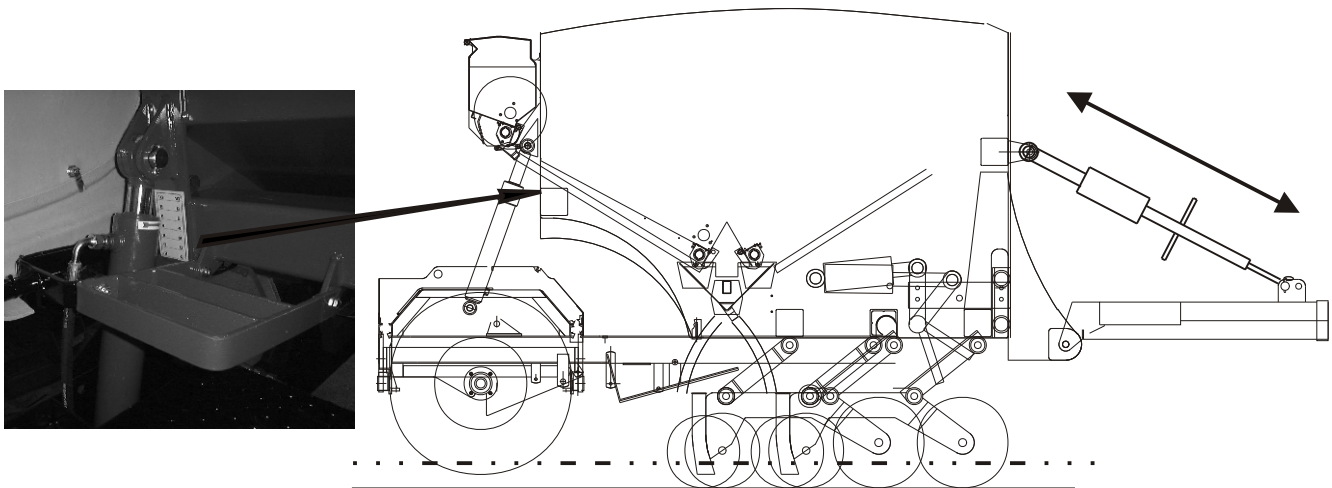


The values given in the chart are for guidance only, due to variations in the quality of seeds. Run calibration test to ascertain values. E.g. required sowing rate 32 kg/ha timothy, use adjustment settings 3.5.

12.3 SOWING TO DIFFERENT TYPES OF SOIL

Four phases to adjust Junkkari Simulta Superseed drills working position, working depth and coulter weighting.

Phase 1. Machine height and working position



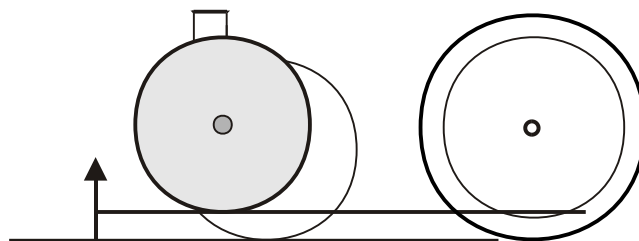
Phase 2. Adjusting the actual sowing depth

The actual sowing depth is adjusted by moving the plastic coulter support wheel in relation to the coulter disc.

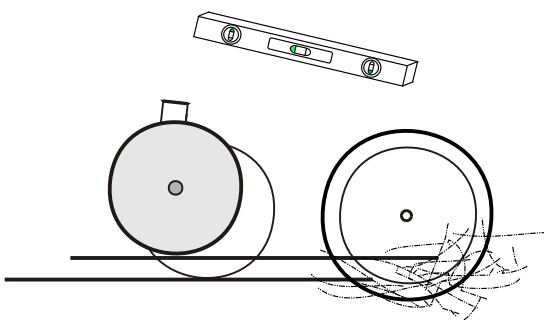
If there is a lot of crop residue, the whole machine can be tipped to its "nose", to get the opener discs to cut deeper to the soil. When performing traditional sowing, and the soil is very soft, the machine can be tipped backwards.

DRIVING DIRECTION →

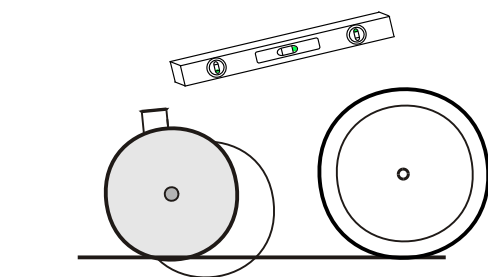
adjustable area
approx. 0,5 - 6,5 cm



Ordinary situation, crop residue to some extent.



Lots of crop residue, opener disc deep down.



Opener disc at the surface, no crop residue, but soft soil and lots of turning to be done.

Phase 3. Coulter weighting and choosing the sowing method zone

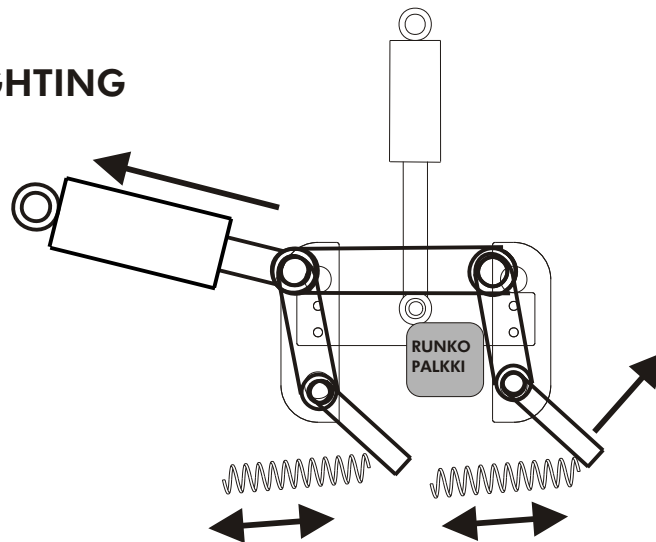
The sowing method zone, either direct sowing or traditional tilled ground sowing, is chosen hydraulically. The zone choice influences to the achievable coulter weight.

Adjust the coulter weighting to suit the soil with the dual functional hydraulic block to achieve the desired sowing depth.

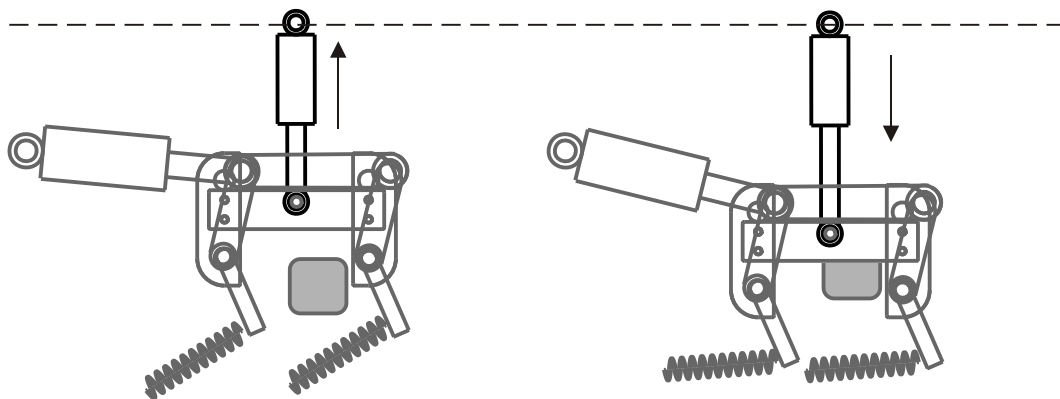
NOTE. Use as little spring power as possible (the plastic wheels are supposed to just occasionally balance the excessive power, which leads them to stop sometimes. On flat ground they must be turnable by hand).



COULTER WEIGHTING



SOWING METHOD ZONE ADJUSTMENT

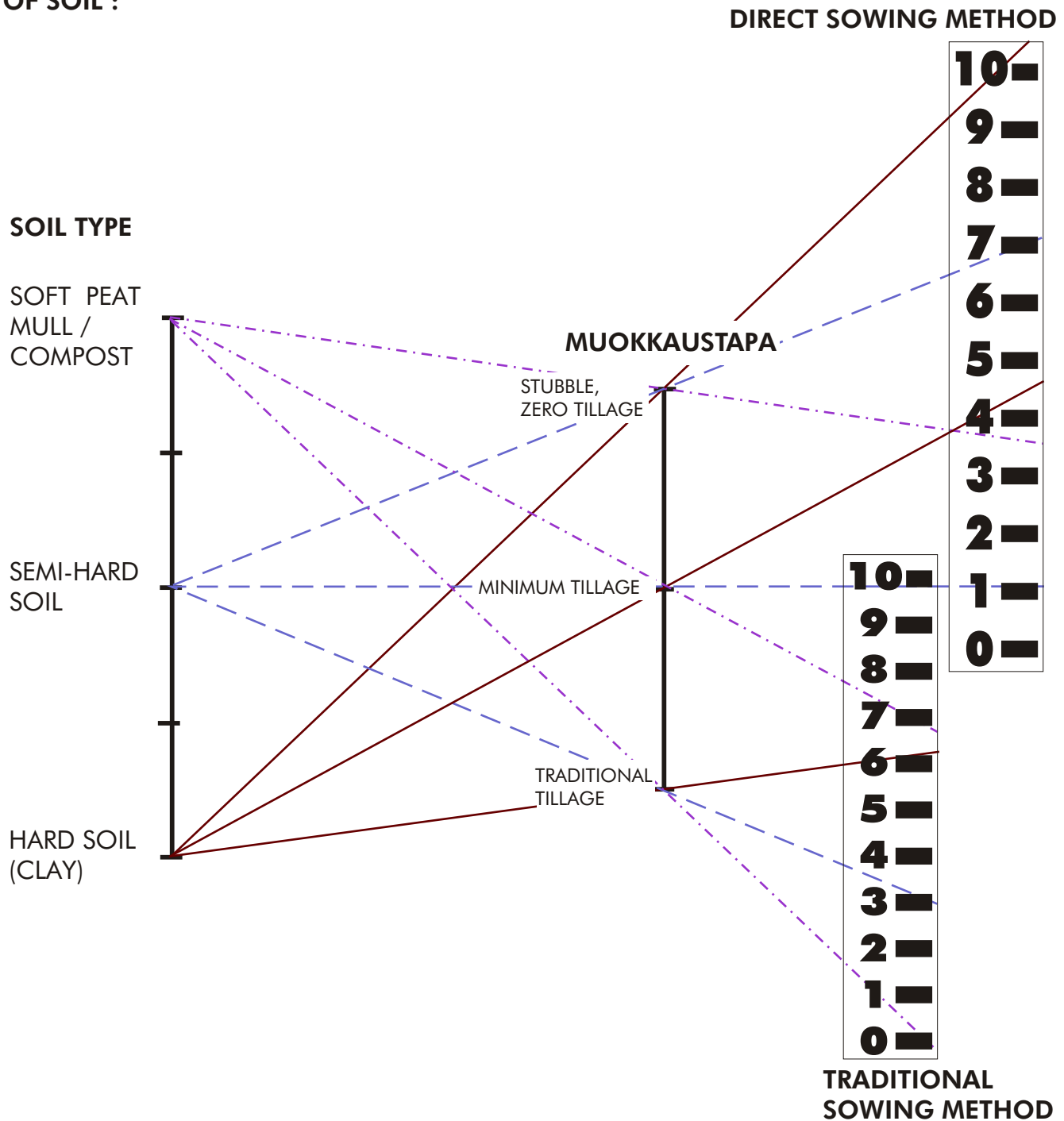


TRADITIONAL SOWING,
TILLED GROUND

DIRECT SOWING

NOTE. TO PREVENT COULTERS FROM DAMAGING, ALWAYS LIFT THE MACHINE UP WHEN MAKING STEEP TURNS!

ASSISTING TABLE FOR COULTER WEIGHTING ADJUSTMENTS WITH DIFFERENT TYPES OF SOIL :



INFLUENCE OF CROP RESIDUE

The cutting effect of the front openers is improved when the machine is tipped slightly to its "nose".

INFLUENCE OF DRYNESS

In case the soil is extremely dry, the coulter weighting should be increased a little.

PLEASE NOTE THAT THE VALUES GIVEN IN THE CHART ARE FOR GUIDANCE ONLY, DUE TO VARIATIONS IN THE GROUND HUMIDITY LEVELS AND AMOUNT OF CROP RESIDUE ETC.

12.4 SOWING TECHNIQUES

It is always recommendable to get acquainted with a new machine or machine model by taking the time to operate the machine in trial run with the hoppers empty. This is especially beneficial if done well in advance of the busy sowing season, so that the operator gets accustomed to the necessary adjustments and the general structural details of the machine.

SOWING SEASON

The correct timing of the start of the sowing is of fundamental significance to the resulting growth. The starting point is determined mainly by the soil humidity value, which again depends largely on the properties of the soil.

The seeds should be placed into the soil in such a manner that their access to the moisture contained in the soil is preserved, even though the amount of moisture should not be excessive. A rule-of-thumb is that if the soil clings to the tyres, then the timing of the starting point of the sowing season should be reconsidered.

The temperature of the soil may be taken as one of the consideration points for the timing of the sowing. The sprouting will take long when the soil temperature remains low and part of the seeds may not sprout at all. Never attempt to sow above a frozen ground layer.

Should the timing of sowing present problems due to lack of personal experience, it is advisable to turn to expert advice from e.g. agricultural organizations.

FERTILIZING

Fertilizing means supplying the plants with nutrients and the requirements can be best determined by a growth potential test. The amount of fertilizer required by the growth is usually calculated on the basis of the fertilizer's nitrogen content. The most suitable of the different fertilizer types, which all have the same nitrogen content, is the one providing also other nutrients, such as trace elements, required by the growing plants. If the chosen fertilizer is lacking in a specific nutrient or if it contains an excess of the same for the plant requirement, the situation may be balanced the following year by choosing a fertilizer with the opposite values for this nutrient. The representatives of the fertilizer manufacturers will help out when determining the requirements of fertilizer based on conditions of the area and the varieties grown on the farm.

SEEDS

Each plant variety has its own specific growth density for producing the best yield. A too small quantity of seeds does not give the best yield and may produce late re-sprouting. Too large amount of seeds is again wasteful, does not produce the ideal yield and also one of the causes for easily laid crops.

The required quantity of seeds for sowing a given area must be determined by taking into account the quality of the seed, its germinative capacity, its size, the object of the sowing and the prevailing conditions for growing the crop.

It is usual in grasslands to grow a protective cereal crop over the grass. The best varieties for this purpose are the early, short and stout-stalked grains, e.g. barley. To prevent any hindrance to the sprouting of the grass seeds from the protective plant growth, it is advisable to reduce the sowing rate for the latter by 20-40%.

The required quantities of seeds should always be checked and confirmed by the supplier of the seeds or by other, independent experts.

The sowing depth of seeds should always be chosen as shallow as possible for rapid sprouting. The important point to note is that the seeds are provided with moisture in all possible conditions. Therefore avoid too shallow drilling depths in a soil that is prone to dry up quickly, otherwise the moisture in the top soil evaporates away and the seeds are left in a dry ground. On lands, which are lacking in moisture in the springtime, it is advisable to drill the seeds adequately deep, even in despite of a lengthened sprouting period, to ensure a successful crop growth.

The actual drilling depth should always be ascertained from the soil as the sinking of the wheels into the soil, the varying soil conditions and tilling techniques make it impossible to produce generally acceptable tables and charts or measuring methods for the determination of the correct drilling depth to cover all possible variations.

The seeds and fertilizer will be placed to the same row when sowed with Simulta Superseed direct drill.

PESTICIDE TREATMENT

The pesticide treatment / spraying can be done before, or after the sowing. It is recommended to always perform treatment before sowing, when the sowing is done in the autumn. In any case, there has to be 72 hours between sowing and pesticide treatment.

The principle of pesticide treatment should be, that the weed population is not disturbed or broken, and the pesticide treatment is not done before the weeds have grown enough (the leaf surface should be quite large). If the user is uncertain from a suitable way of action, contacting the experts is recommended.

The actual drilling depth should always be ascertained from the soil as the sinking of the wheels into the soil, the varying soil conditions and tilling techniques make it impossible to produce generally acceptable tables and charts or measuring methods for the determination of the correct drilling depth to cover all possible variations.

JUNKKARI

WIZARD- MULTI-FUNCTION
DRILL CONTROL FOR
SIMULTA SUPERSEED
DIRECT DRILL



62375 YLIHÄRMÄ FINLAND
TEL. +358-(0)6-4835111
FAX +358-(0)6-4846401

Tai fax. 44 (0) 1453 733311

ENGLISH 2003 CE

Electro - Magnetic Compatibility (EMC)

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The Junkkari multi-function drill control has an illuminated 4-digit display with display functions for :

- Forward speed km/h
- Area worked (part and total area)
- Bout count and tramline bouts
- Fertilizer distribution shaft and seed distribution shaft control
- Hopper level alarm

The Drill Control has two memory registers to record part and total area worked. Data is automatically stored in memory when the instrument is powered off.

In normal operating mode the instrument display defaults to the tramlining channel unless either the area channel is selected or an alarm condition exists.

The instrument must be initially calibrated to suit the implement being controlled. The program mode allows default settings to be altered as required.

The drive computer can also be used to control the hydraulic row marker functions.

1. DEFAULT SETTINGS

The Wizard has three kinds of default settings :

The Wizard default settings (first default setting)


- In case the monitor has to be reset, these are the settings it will return to.

Settings, that are programmed at Junkkari : (second default setting)

- Programmed at the factory
- Especially altered settings for Simulta

User preference settings : (third default setting)

The settings, that the operator is able to program :

To start programming, select function to alter and press **+1** button for three (3) seconds, set value with  button.

Function	Programmable value	default setting (Wizard)	default setting	default setting (User)
1. Km/h	Wheel circumference*	2.000m	c.a. 1.32	-----
2. Ha	Working width	2.000m	machine width	-----
3. Tramline	Tramline marking	Sy.04	Sy/Al/Ar/18m/OFF	-----
4. Fert. shaft speed	Low speed alarm	0.000rpm	0.01 with switch 0.00 w/o switch	-----
5. Seed shaft speed	Low speed alarm	0.000rpm	0.01 with switch 0.00 w/o switch	-----
6. Hopper level	Hopper level alarm on/off	1	1 = ON	-----

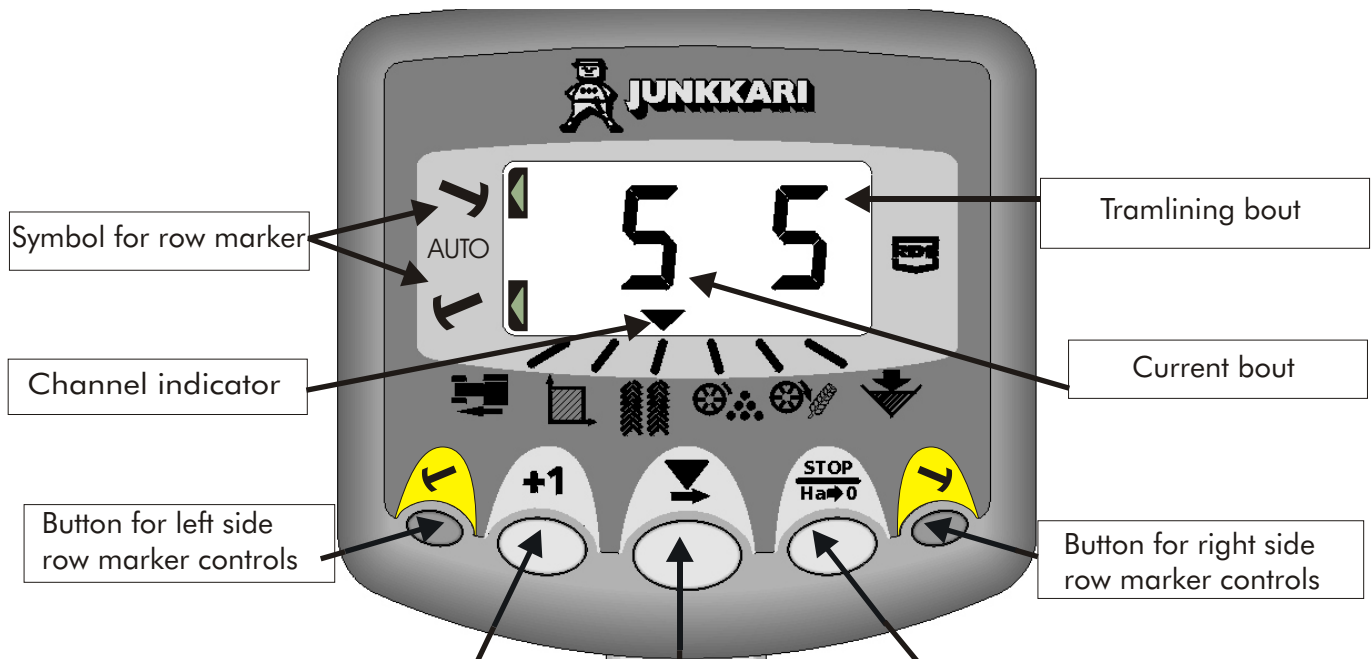
* press **+1** and  to start automatic speed calibration. Press  after 100m drive.

The Wizard default settings :

Press and hold **+1** to switch on power. Select function with **+1** button. Set value with  button.

Function	Programmable value	default setting (Wizard)	default setting	default setting (User)
1. Km/h	No function	-	-	-----
2. Ha	Total area (unprogrammable)	-	-	-----
3. Tramline	No function	1	1=ON/0=OFF	-----
4. Fert. shaft speed	Speed pulse / round	8.000	12 with switch 0 w/o switch	-----
5. Seed shaft speed	Speed pulse / round	8.000	12 with switch 0 w/o switch	-----
6. Hopper level	No function	-	-	-----

2. OPERATING SUMMARY



EITHER :

1. Select the  channel then **PRESS +1** to switch between Area Total 1 and 2.

OR

2. Select the  channel and **PRESS +1** to manually advance the Bout Number.

OR

3. **HOLD +1** continuously to select the programming mode. (Normal Mode is resumed when the button is released).

Press to select the display function

PRESS $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$ to override automatic advance of bout number if drill is lifted (press again to resume)

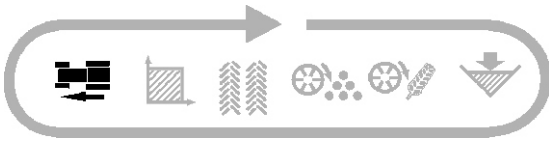
OR

HOLD $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$ to reset currently displayed Area Total

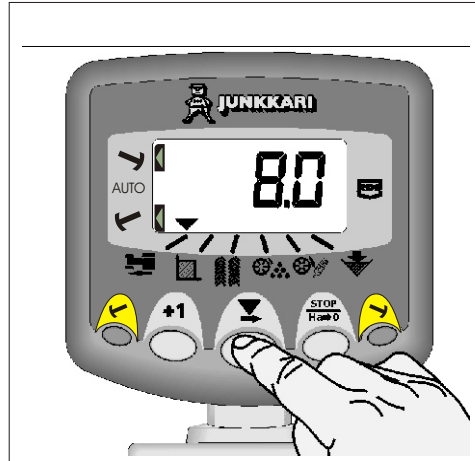
CH	Function	Units
1	Forward speed	km/h
2	Area Total 1 or 2	ha
3	Tramline / Current bout	-
4	Fertilizer shaft speed	rpm
5	Seed shaft speed	rpm
6	Hopper level alarm	"alar"

3. FORWARD SPEED / SENSOR CALIBRATION

1 SELECT FORWARD SPEED



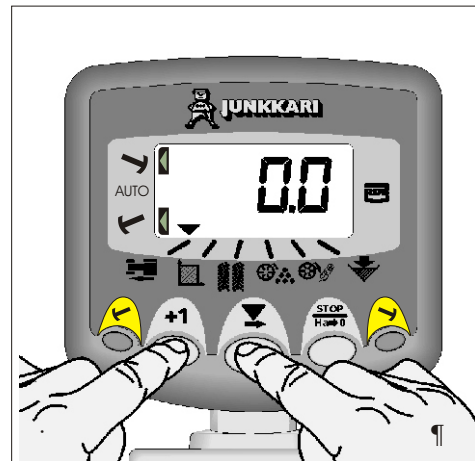
If the forward speed goes less than 2 km/h, then the instrument will beep twice and the display alternates between the selected channel and the forward speed channel.



2. SPEED SENSOR MANUAL CALIBRATION

The speed sensor has been mounted to the end of the fertilizer distribution shaft in the Junkkari Simulta drill. The theoretical calibration figure equals the rolling circumference (diameter x 3,142) of the land wheel in metres. **The average default value is 1.32.**

Automatic calibration is however more accurate in field conditions.



↑ Select the channel and release.

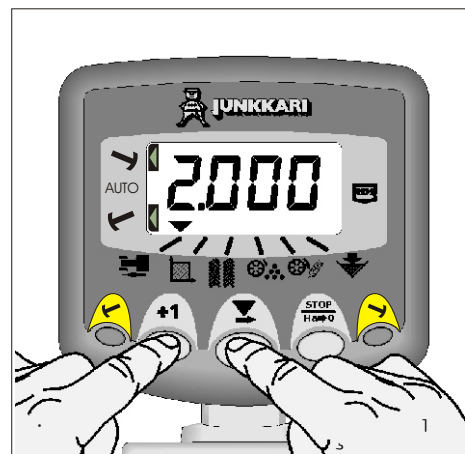
· HOLD **+1** CONTINUOUSLY and...

↓ PRESS to select the digit or decimal point.

2.000, 2.000, 2.000, 2.000, etc

↑ HOLD to change the digit or move the decimal point.

2.100, 2.200, 2.300, 2.400, etc



○ RELEASE to select the next digit and repeat the procedure as necessary.

» RELEASE **+1** to end programming. The set values are saved to the device memory.

3. AUTOMATIC SPEED CALIBRATION

Auto-calibrate in field conditions for maximum accuracy.

1 Set the markers 100 m apart and position the vehicle opposite the first marker.

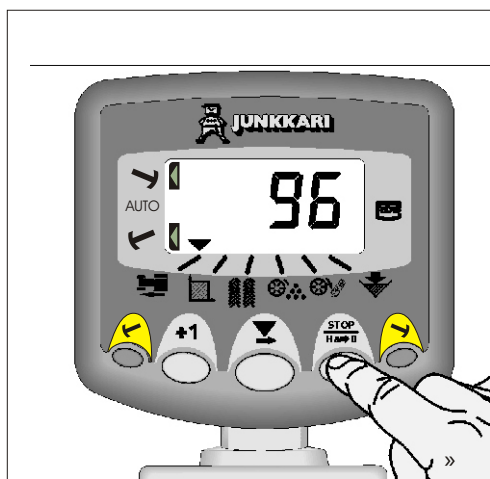
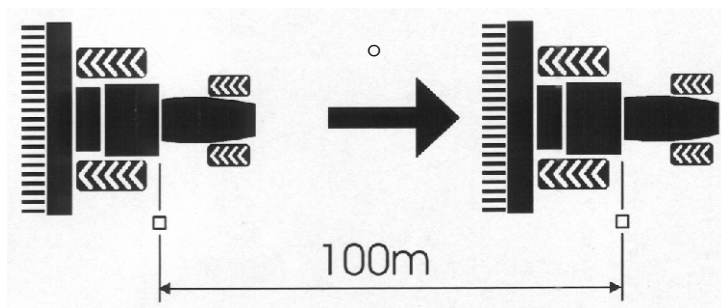
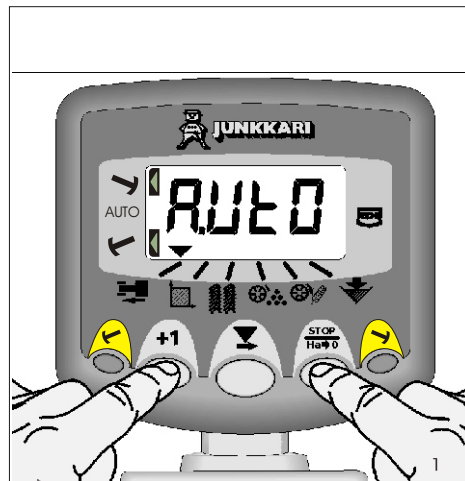
· Select the  channel.

· HOLD **+1** CONTINUOUSLY.
The instrument enters programming mode after three (3) seconds.

1 PRESS $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$.
Auto calibration will then begin.

○ Drive up to the second marker.
The instrument displays the total number of sensor pulses received over the distance.

» PRESS $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$.
Speed calibration is now complete.
The calibration factor is automatically calculated and stored in the memory.

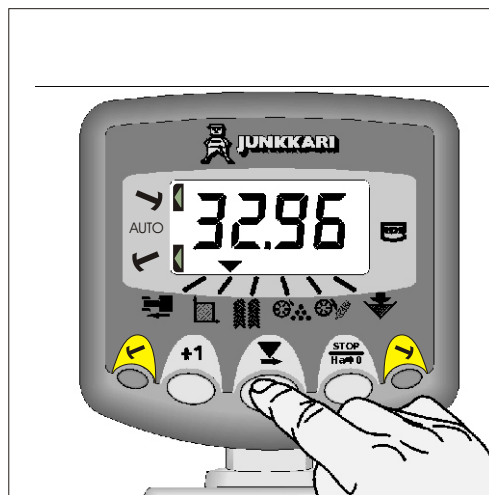


4. AREA / WORKING WIDTH

1. SELECT AREA CHANNEL



There are two area registers, each independently resettable.

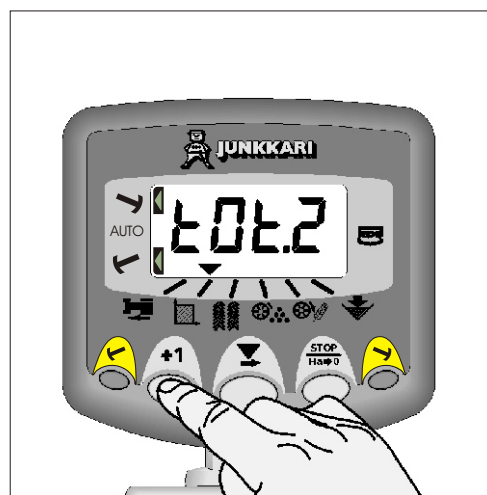


2. SELECT AREA REGISTER

PRESS **+1** to cycle between the two area registers, TOT1 and TOT2.

The display shows then the area accumulated since the last area reset.

These two area registers can be accumulated separately, one can be used for total worked area and the other can be used, for example, to accumulate area worked at one field.



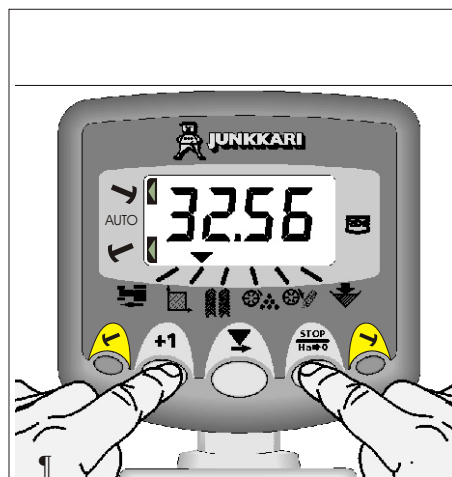
3. RESET AREA REGISTER

Select the TOT1 or TOT2 and release.

HOLD **STOP** \rightarrow 0 for 5 seconds.



The total then resets to zero.



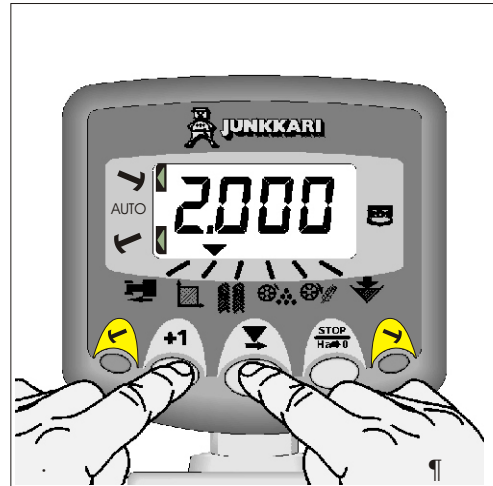
4. PROGRAMMING THE WORKING WIDTH


The working width of the machine in metres.

¶ Select the  channel.


· HOLD **+1** CONTINUOUSLY

The instrument enters the programming mode after 3 seconds.




· PRESS  to select the digit or decimal point.

 2.090,  2.000,  2.000,  2.000 etc

1 HOLD  to change the digit or move the decimal point.

 2.100,  2.200,  2.300,  2.400, etc

° RELEASE  to select the next digit.

» RELEASE **+1** to end programming. The set values are saved to the device memory.



5. TRAMLINING

There are four systems of tramlining- symmetrical, asymmetrical left, asymmetrical right and 18 metre. The tramline bout is programmable from 0 (no tramlining) to 15 in symmetrical, asymmetrical left and asymmetrical right sequences.

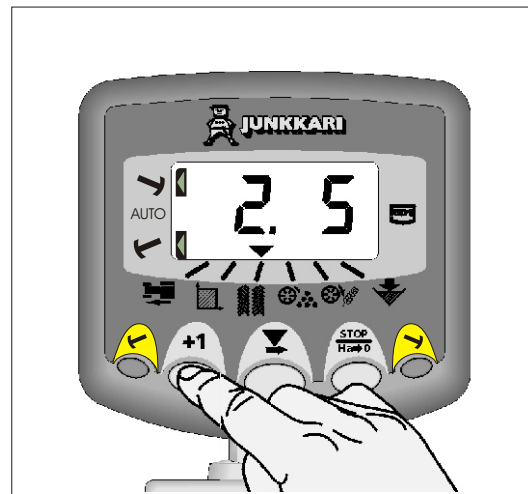
The display defaults to the  channel after 10 seconds (unless the AREA TOTAL was selected).

Selection of the asymmetrical tramlining is denoted by a decimal point on the display between the current bout number on the left and the tramline bout on the right.

Left or right asymmetrical tramlining is selected in the programming mode.

1. MANUALLY ADVANCE BOUT NUMBER

PRESS **+1** to advance the current bout number by one.



2. HOLD BOUT NUMBER when the machine is lifted

PRESS $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$ to hold the current bout when the drill is lifted.

This way the program will not register the lift of the machine as a change of bout. The row marking function stops as well.

The display will flash "STOP".

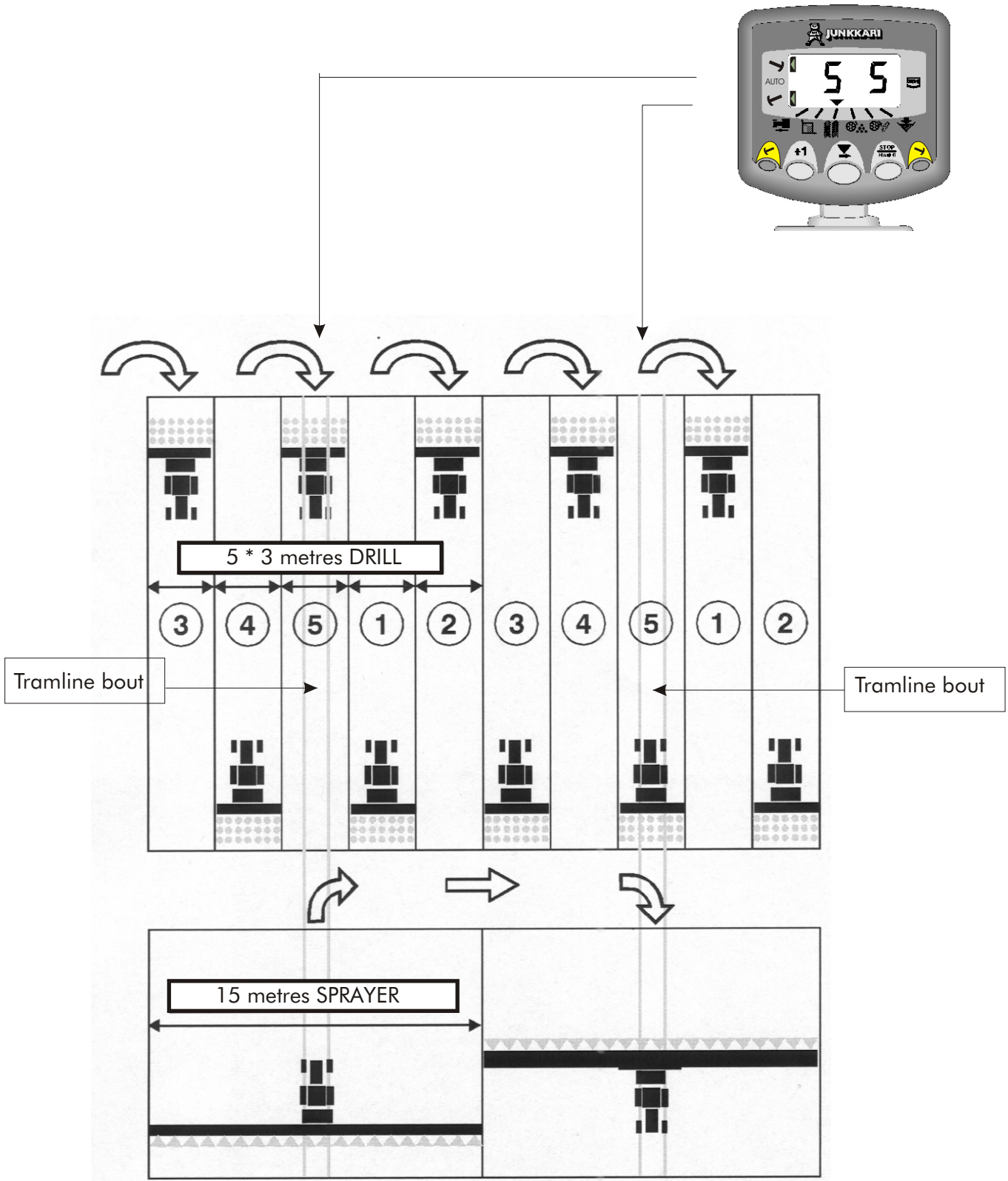
PRESS $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$ again to resume the normal bout sequence.



5.1 SYMMETRICAL TRAMLINING

2+2 seed spouts are closed during the tramline bout only. Refer to section 6.3.5 to programme the instrument for symmetrical tramlining.

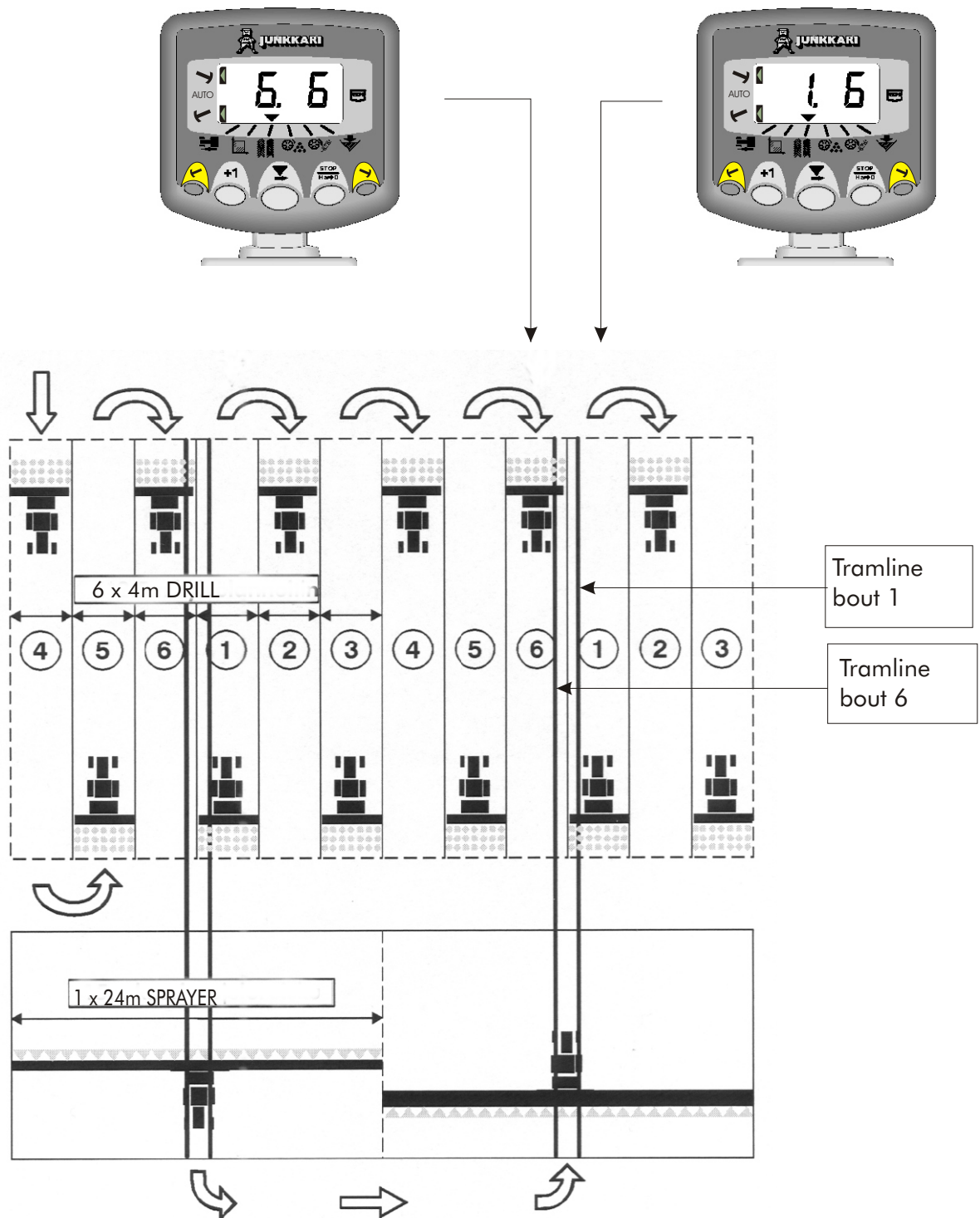
The instrument will beep once at the beginning of the tramline bout, and the display will continue flashing for the duration of the bout.



5.2 ASYMMETRICAL LEFT TRAMLINING

2 seed spouts are closed on the **left hand side** of the drill on bouts 1 and 6. Refer to the section 6.3.5 to programme the instrument for asymmetrical left tramlining.

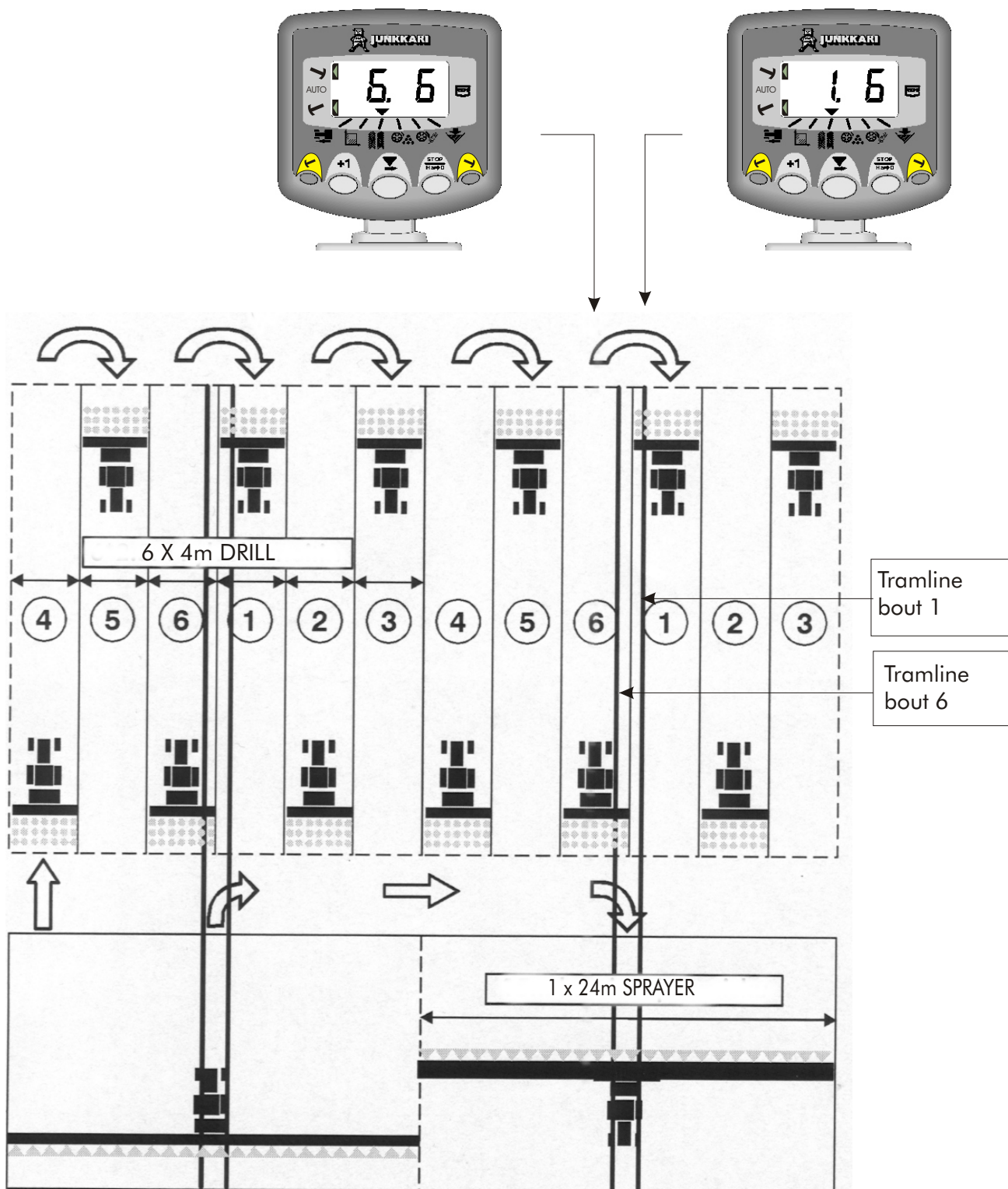
The instrument will beep once at the beginning of each tramline bout, and the display will continue flashing for the duration of the bout.



5.3 ASYMMETRICAL RIGHT TRAMLINING

2 seed spouts are closed on the **right hand side** of the drill on bouts 1 and 6. Refer to the section 6.3.5 to programme the instrument for asymmetrical left tramlining.

The instrument will beep once at the beginning of each tramline bout, and the display will continue flashing for the duration of the bout.



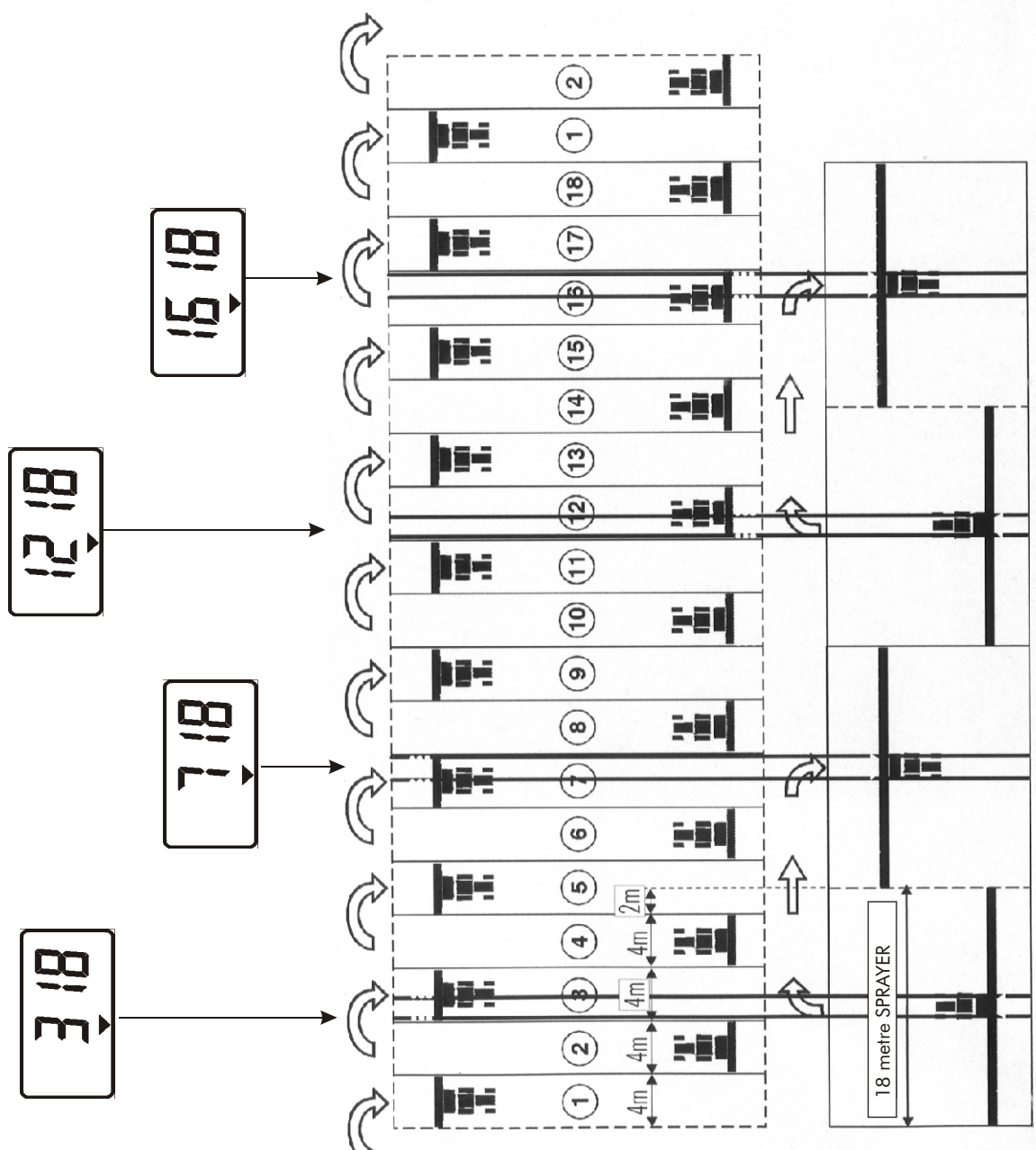
5.4 18 METRE TRAMLINING

This method is used in cases where the width of the drill is 4 metres and the width of the sprayer is 18 metres. In this case, the width of the sprayer is not evenly divisible by the width of the drill. As a result the tramlining combination switches must be mounted asymmetrically on the sides of center of the drill. In this case, the drill requires two pairs of tramlining combination switches, one pair per side of the machine, and the center of the spraying tractor path will be in quarter of the drill working width (see illustration below).

Starting on bout 1 requires turning LEFT at the end of the FIRST bout.

NOTE : To turn right at the end of the first bout, cycle the instrument display through to bout 10 before beginning.

The instrument will beep once at the beginning of each tramline bout, and the display will continue flashing for the duration of the bout.

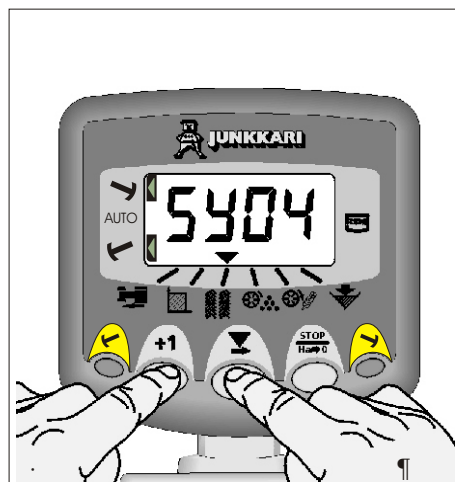


PROGRAMMING OF THE TRAMLINE BOUT

The tramline bout is programmable from 1 to 15 for either symmetric left or asymmetric right tramlining.

It is also programmable for 18 metre tramlining.



To switch off the tramlining function, select "OFF" from the bout cycle.

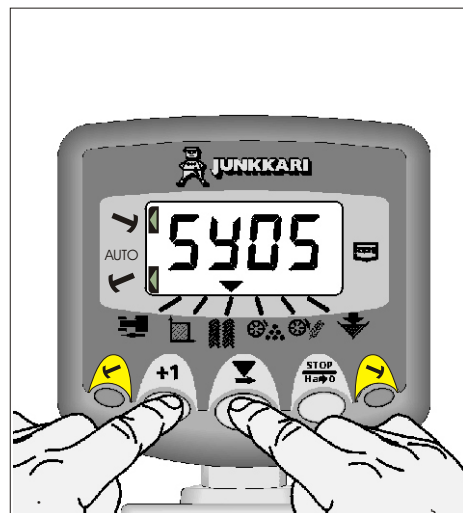


Select the  channel.

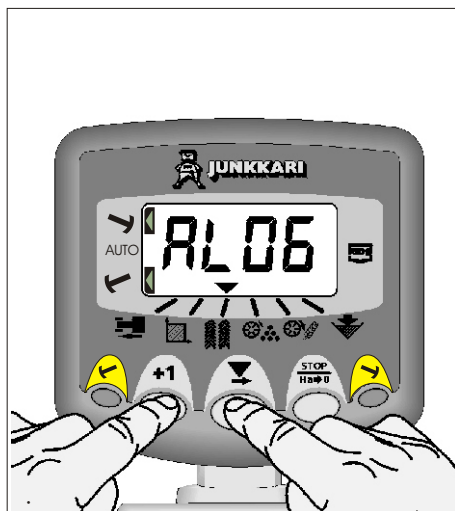
HOLD  CONTINUOUSLY.

The instrument enters program mode after 3 seconds.

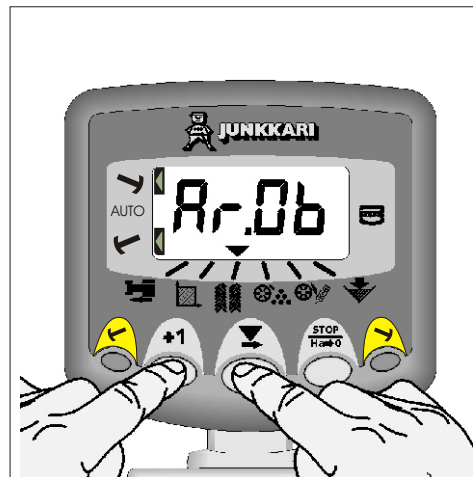
PRESS  and the tramline bout cycles ...Sy05, Sy06, SYC...SY15 for symmetrical tramlining.



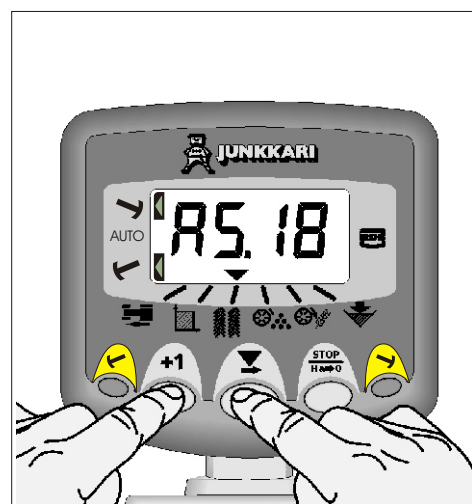
... Then AL.01,AL.02...AL.15 for asymmetric **left** tramlining.



Then Ar.01, Ar.02...Ar.15 for the asymmetric **right** tramlining.

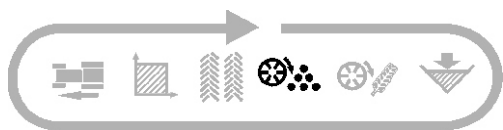


... Then 18 for the 18 metre tramlining mode.



6. FERTILIZER DISTRIBUTION SHAFT SPEED / ALARM

1. FERTILIZER DISTRIBUTION SHAFT CONTROL



With the default alarm setting, if the fertilizer distribution shaft stops for more than 40 seconds the instrument will sound 5 beeps and will default to the channel from the current channel selected.

Cancel the alarm by either restoring the shaft rotation, selecting another channel or switching the instrument off and then on again.

Alternatively you can turn off the alarm by pressing and holding the button for 5 seconds. The channel will then show "OFF". The alarm function will stay off until the instrument is switched off and then back on again.

Alarm is inhibited if forward speed is less than 2 km/h.

The default low speed alarm is 0 rpm.

2. SETTING THE LOW SPEED ALARM

¶ Select the channel.

· HOLD **+1** CONTINUOUSLY

The instrument enters the programming mode after 3 seconds.

◌ PRESS to select digit or decimal point.

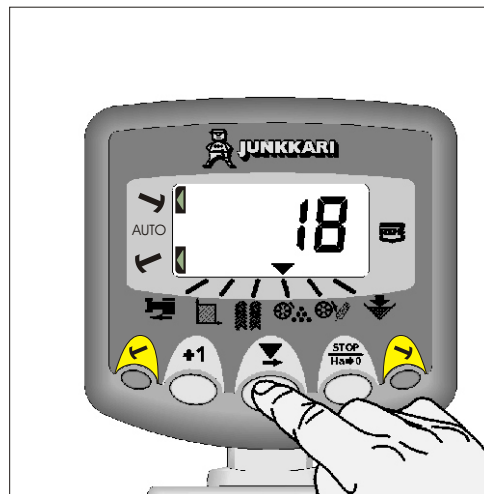
2:000, 2:000, 2:000, 2:000, etc

¶ HOLD to change digit or move the decimal point.

2:100, 2:200, 2:300, 2:400, etc

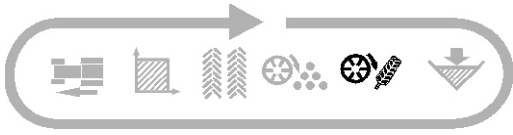
◌ RELEASE to select next digit.


» RELEASE **+1** to end programming. The set values are saved to the device memory.





7. SEED DISTRIBUTION SHAFT SPEED / ALARM

1. SEED DISTRIBUTION SHAFT CONTROL



With the default alarm setting, if the fertilizer distribution shaft stops for more than 40 seconds the instrument will sound 5 beeps and will default to the  channel from the current channel selected.

Cancel the alarm by either restoring the shaft rotation, selecting another channel or switching the instrument off and then on again.


Alternatively you can turn off the alarm by pressing and holding the  button for 5 seconds. The  channel will then show "OFF". The alarm function will stay off until the instrument is switched off and then back on again.

Alarm is inhibited if forward speed is less than 2 km/h.

The default low speed alarm is 0 rpm.



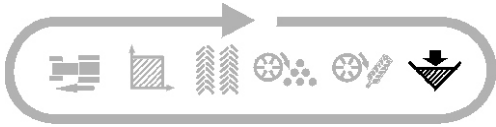
2. SETTING THE LOW SPEED ALARM


With the  channel selected, follow exactly the same procedure as for the fertilizer distribution shaft speed channel. (Chapter 6.4)

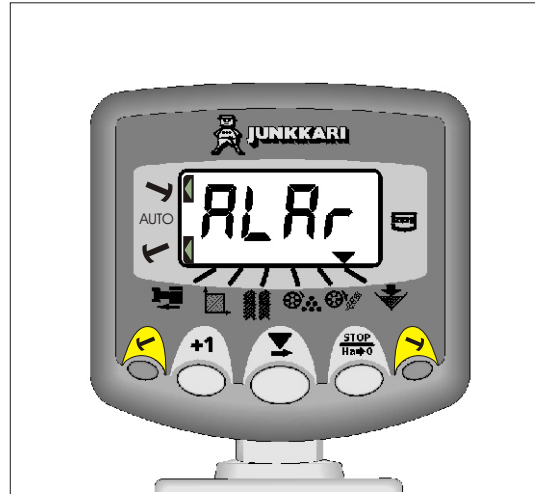
NOTE: Both fertilizer distribution shaft and seed distribution shaft speed are obtained from the tramline device, therefore the instrument will NOT show either shaft speed when on a tramlining bout, AND the alarm will be inhibited.

8. HOPPER LEVEL

1. HOPPER LEVEL ALARM




If either the seed or fertilizer level drops below the sensors (fitted in the side of the hopper), the instrument will beep 5 times and will default to the  channel from the current channel selected.



2. ENABLE / DISABLE HOPPER LEVEL ALARM

1. Select the  channel.

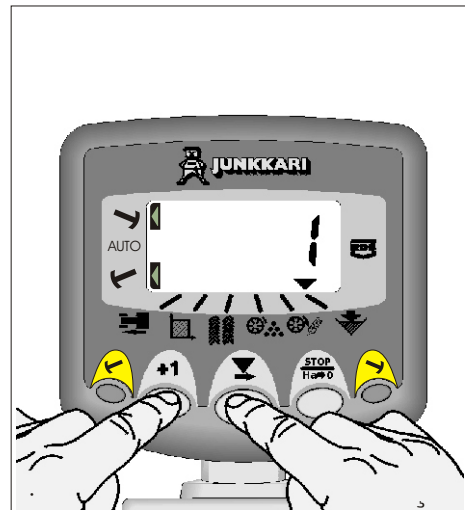
2. PRESS and HOLD **+1** CONTINUOUSLY.

3. PRESS  to select 0 or 1.

0 = Alarm disabled

1 = Alarm enabled

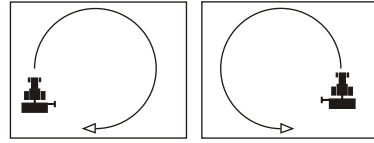
The display will stay blank when the alarm function is switched off.



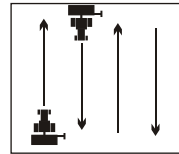
9. ROW MARKING

The row marker is on when the Wizard is switched on, and it is in the manual row marking-mode.

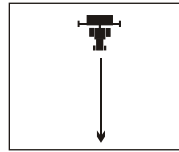
In the manual row marking-mode only one side row marker is in use, either the right or the left one.





In the automatic row marking-mode the right and the left marker alternate, the change of side is done when the drill is lifted. Automatic operation can be started either left or right.



When the row marking is done to both sides of the drill, both markers are lowered down from the Wizard.



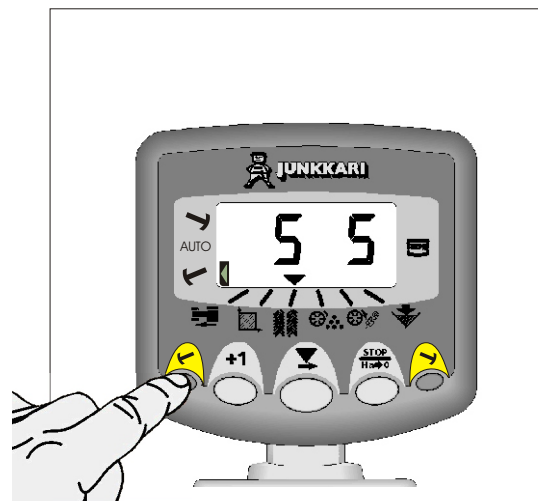
1. MANUAL ROW MARKING-MODE

PRESS (less than 3 secs.) either  or  .

The manual row marking is switched on by pressing either right or left row marker button.

If the row marking is done continuously to the right side of the machine, press the right marker button, and if it is done to the left, press the left marker button.

The function is turned off by pressing the same button shortly again. Until the drill is lifted, the marker will stay lowered and the row marking symbol will flash on the display to remind that the solenoid valve is open (marker lowered).



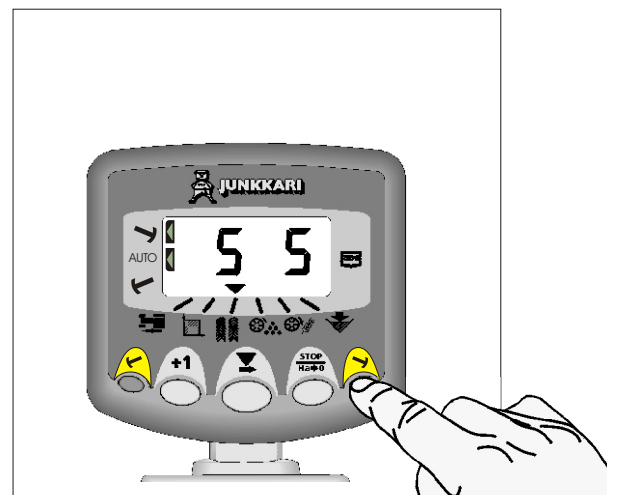
2. AUTOMATIC ROW MARKING MODE

HOLD either  or  CONTINUOUSLY.



The instrument enters programming mode after three (3) seconds.

The automatic row marking mode is switched on by pressing continuously either right or left side row marker button, depending on which side of the drill the row marking is required to start from.

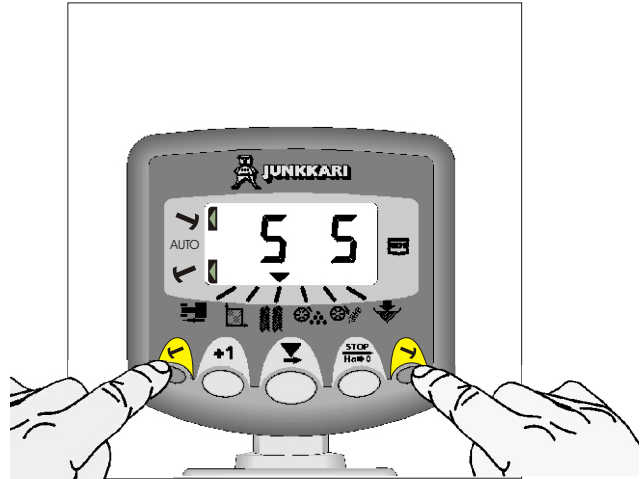
The function is turned off by pressing the same button continuously again.



3. SIMULTANEOUS ROW MARKING TO BOTH SIDES OF THE DRILL

PRESS  and  shortly in sequence.

To switch on simultaneous row marking to both sides of the drill, press both row marker buttons in sequence. When the end of the field is reached and it is time to switch to another row marking mode, follow instructions due to what type of row marking is required, see chapters 1 and 2 on last page.



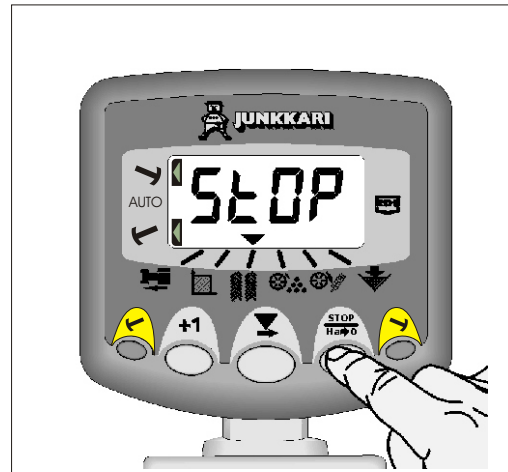
4. LIFTING THE DRILL

PRESS $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$ to "hold" the current bout when the drill is lifted.

This way the row marker program will not register the lift of the machine as a change of bout even though the row markers lifted up and lowered down along with the machine. The tramlining function stops as well.

The display will flash "STOP".

PRESS $\frac{\text{STOP}}{\text{Ha} \rightarrow 0}$ again to resume the normal bout sequence.

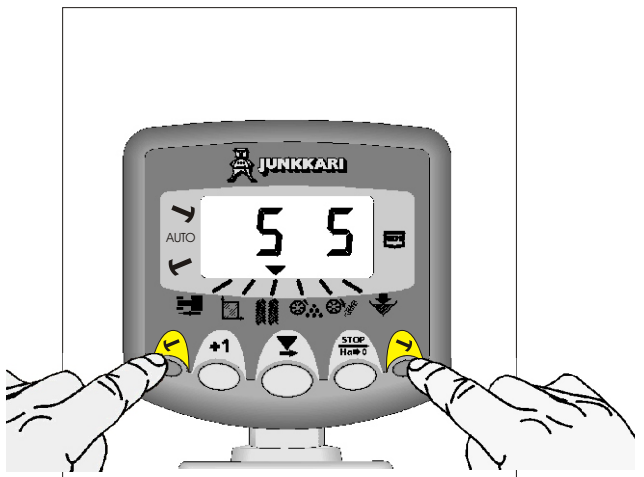
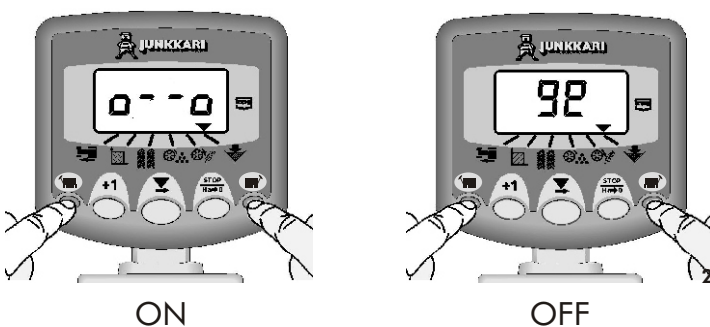


5. HOW TO TURN ROW MARKERS ON / OFF

HOLD  and  CONTINUOUSLY to turn on or off the row markers.

The row marking function is turned on and off by holding continuously both marker buttons at the same time for over 3 seconds.

The display, see illustrations below.



13. MAINTENANCE



READ THE SAFETY INSTRUCTIONS FIRST



The Simulta Superseed models 3000 and 4000 are equipped with service supports, located on both sides of the hopper, at the rear of the machine.

The service supports must be used if there is a need to go under the machine, for example, when the basic adjustment of the sowing depth is done by adjusting the plastic support wheels on the coulters. The machine must never be left supported only by the hydraulics in any case.



The service support is lifted up on figure 10a. The service support is lowered down by removing the linchpin and cotter bolt, and lowering the support down while the machine is supported by hydraulics.

The service support is lowered down and the machine is no longer supported by hydraulics in the figure 10b. The service support is secured on its place with the same cotter bolt and linchpin.



13.1. LUBRICATION

Correct lubrication prevents wear and breakdowns during the busy sowing season. The lubricant used must be a good quality multi-purpose grease. Check always when lubricating that the lubrication nipples are unblocked and that the grease gun nozzle is in good condition. The lubricating chart is found later on this manual.

13.2. CLEANING AND STORAGE DURING OPERATING SEASONS

The machine should be shielded during the operating season from rain and the coulters should be kept above ground when the machine is stored outdoors. If left on ground, moisture is condensed inside the coulters and plastic tubing causing obstructions particularly to the fertilizer flow through the feed mechanism and the coulters. It is a recommended practice that the fertilizer hopper is emptied after each sowing run and that the machine is lifted onto e.g. forklift pallets to rest above ground. The trailed models can be left up supported by the hydraulics providing that the pressure line ball valve is closed and the support leg is used.

The fertilizer feed grooves should be turned fully open before commencing a sowing run and from time to time during the actual sowing run. This procedure will loosen any fertilizer stuck in the groove and results in maintaining the correct feed rate. It also prevents any damage to the feed mechanism caused by hard lumps of fertilizer.

13.3 DO-IT-YOURSELF REPAIRS

DAMAGED COULTERS

Coulter discs, feed tubes and all wearing parts of the coulters can be replaced separately. It is recommended to replace the disc bearings, if a coulters disc is replaced.

The coulters are separated from the drill frame to perform maintenance. Then the coulters are both easier, and safer to detach. The coulters are fixed to the drill frame with M20 screws and nuts.

The machine must be properly supported not to cause any threat of danger, in case the coulters must be detached under the machine.

RENEWAL OF COULTER DISCS AND PLASTIC SUPPORT WHEELS

The plastic support wheel can be removed from the coulters, when the coulters are separated from the drill frame, as follows: Remove the cover from the center of the wheel and the circlip under it.

The bearings are removed by carefully pulling the wheel outwards. In case the bearings are tight, help by pushing, for example, with a big screw driver, from the reinforcements inside the wheel.

To remove the support wheel arm, remove the circlip from the front end of the arm, and the coulters height adjustment lever split pin and washer. The lever itself has slide bearings.

If necessary, the scraper can be replaced easily now. Scraper is fixed with M12 nut and washer.

The coulters discs and their bearings are replaced as follows: Remove the circlip from the disc hub and pull the disc and hub from off the axle. The hub is removed from the disc by opening four (4) M8 nuts and allen screws. It is recommendable to renew all seals and bearings to the hub at the same time.

The coulters disc is put together in opposite order using new parts.

RENEWAL OF THE OPENER DISC

Remove the opener disc by opening 4 pcs M12 screws. The opener disc hub is removed by removing the dust cap and opening the M20 nut under it. Then the hub can be pulled off its axle and the bearings can be put apart and renewed.

See *Spare parts catalogue* : COULTER.

RENEWAL OF THE COULTER ARM BEARINGS

Remove the coulters arm from the coulters frame by opening M20 screw and crown nut (with split pin). There is a bush inside the bearing housing. Pull out the bearings without damaging the frame and bush, replace bearings and put coulters arm back together in opposite order.

OTHER REPAIRS

FEED ROLLER SEALING RING REPLACEMENT

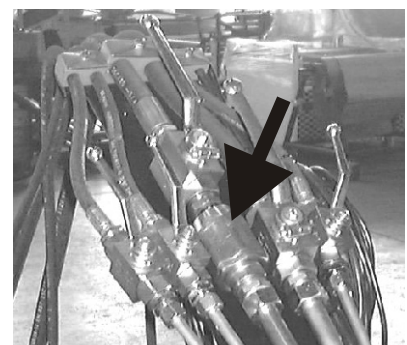
Remove the threaded mounting flange of the feed mechanism adjusting knob from the side panel and all cotter pins from the shaft. Pull the shaft out through the hole in the side panel. The sealing ring is located in a groove on the side of the feed chamber. Insert a thin knife blade or corresponding between the sealing ring and its locking ring forcing the locking ring out of place to enable replacement of the sealing ring.

KONEEN NOSTON NOPEUDEN SÄÄTÖ

The lifting speed of the machine is adjusted at the factory.

If it is necessary to re-adjust lifting speed, it is done by turning the adjustable reducing valve. The reducing valve is placed on top of the hydraulic hose support, between the ball valves.

Reducing valve is secured with a lock nut. Open the lock nut and turn valve clockwise to slow down the lifting, or anti-clockwise to speed up the lifting. Secure the valve with the lock nut after the required adjustment has been done.



REPLACEMENT AND ADJUSTMENT OF BOTTOM FLAPS

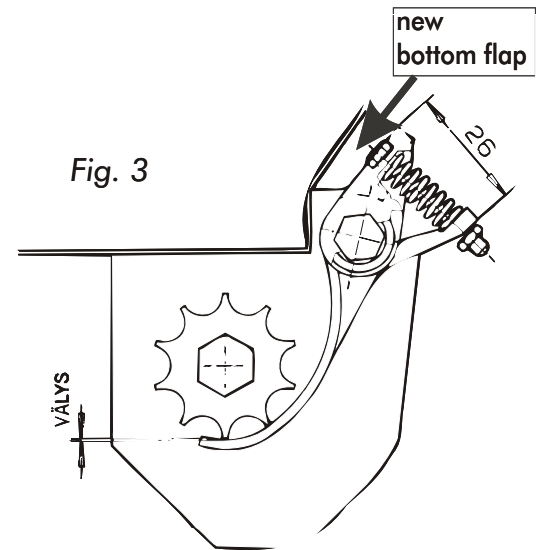
The feed rate is affected in a decisive manner by the condition and the correct adjustment of the bottom flaps. The flap adjustment has been carried out at the factory, but it is always possible that clumped fertilizer, foreign objects etc. may damage a bottom flap despite of its safety release spring. A damaged bottom flap should be replaced by a new one or, if the damage is only slight, it is sufficient to correct the condition by re-adjustment.

BOTTOM FLAP REPLACEMENT

Remove all the hairpin fasteners from the bottom flap operating shaft and mark out the locations of the other parts on the shaft to help in the correct assembly later. Remove the seed side adjustment screw locking to enable the withdrawal of the shaft. The bottom flap can be removed and replaced after having turned the feed rate adjustment to zero reading. The assembled bottom flap is then placed inside the feed chamber and the operating shaft refitted. Check that all flaps stay in the same position in relation to the hexagonal shaft. Re-attach all the parts removed in the process of repair (see Fig. 3).

INDIVIDUAL ADJUSTMENT OF BOTTOM FLAPS

The basic adjustment of the bottom flap spring is correct when the marked distance in the drawing on right is 26 mm. The bottom flap position can be adjusted into both directions within the normal range of adjustment. Tightening of the adjusting screw by one turn increases the feed rate by 7%. Conversely, loosening the screw decreases the feed rate. All bottom flaps in each feed chamber must be similarly adjusted. Move the central adjustment lever into position 1, to enable the checking of the clearance between each flap and its feed roller by your fingertip. The correct clearance is approx. 0.5 mm. The clearance adjustment has been carried out at the factory for all new machines (see Fig. 3).



CENTRAL ADJUSTMENT OF THE BOTTOM FLAPS

Should the calibration test results differ markedly from the values given in the Sowing Chart, the machine may be trimmed towards the chart values within certain limits. It is only natural that there should occur even quite significant differences in the flow characteristics of both seeds and fertilizer. It is therefore not recommendable to commence a major adjusting procedure to correct only slight deviations. The adjustment is carried out by altering the position of the adjusting lever locking latch. The effect of the adjustment is about 1.5% for each 1 mm movement so that tightening of the latch reduces the sowing rate and vice versa. The limiting value for the tightening is that a clearance should remain between the flap and the feed roller when the central adjusting lever is moved to its position 1 (see Fig. 3).

TYRE REPLACEMENT

The best way to change tyres is to remove the bogie half where the wheel should be changed. In case of the left bogie, the drive chain must also be removed.

Practically this is done by removing the bogie half from the bogie carrier, in model 3000 there are 2+2 pcs of M16 screws, and in model 4000 4+4 pcs of M16 screws. Then the machine is lifted up either by using a jack lift, or for example, tractors front loader. When the machine is being lifted up, the bogie half can be drawn from under the machine. When the bogie half is off from under the machine, it can be easily disassembled, and desired wheel(s) can be changed. In case the wheel axle has to be removed, remember to keep the order of the wheels and hubs the same as it was.

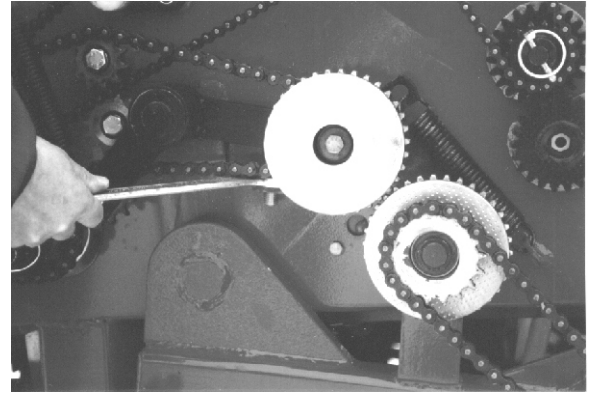
The bogie half is re-assembled by placing it under the machine and lowering the machine down on it. Then fix the bogie carrier to the bogie half and tighten screws with care.



NOTE : WHEN THE DRILL HAS TO BE LIFTED UP, MAKE SURE THAT THE CAPACITY OF THE LIFTING DEVICE IS ADEQUATE TO LIFT THE MACHINE SAFELY !

CLUTCH ADJUSTMENT

It is possible to adjust the clutching/de-clutching point of the feed when raising or lowering the towed drill by adjusting the limit screw of the coupling sprocket. Tighten the locking nut after the adjustment. The basic adjustment has been set at the factory (see Fig on the right).



TYRE PRESSURES

The tyre pressures used affect the total ground pressure exerted by the machine. This in turn affects the compactness of the soil. It is worth noting that by using a smaller ground pressure also means having a lower carrying capacity. The carrying capacity is directly related to the machine's transport speed, so that when using tyre pressures, which are lower than the maximum allowed, the transport speed of the machine must also be lowered. The tyre pressure values given in the tables below have been determined on the basis of the machine weight and the travel speed of 30 k.p.h. (18.7 m.p.h.), which is the structural top speed value for the tyres. When sowing, the function of the tyres is to act as packing rollers over each sown row. Thus it is advisable to use tyre pressures as near the max. values as possible to improve the compression effect on soil especially on soils lacking in spring moisture. It is recommendable to use maximum tyre pressures on stony fields.

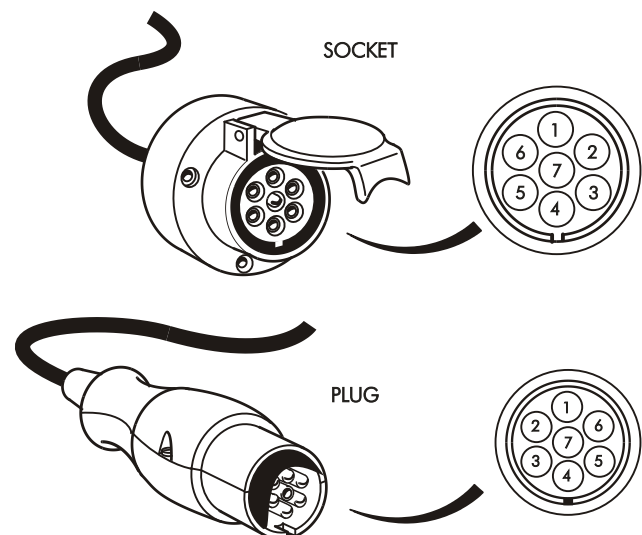
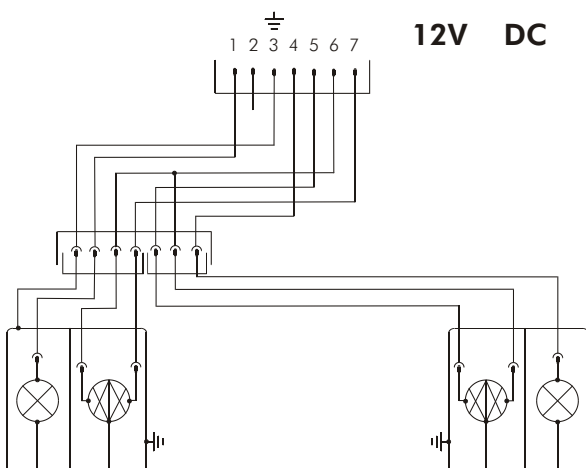
The tyre pressures must be inspected in the beginning of every sowing season with a pressure gauge and visually daily during the season.

7.50-16	6ply	240 kPa	Max. 280 kPa
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13.4 WIRING DIAGRAM

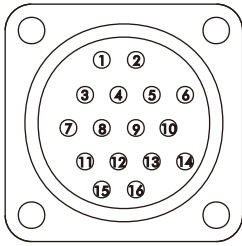
wiring diagram for lighting equipment:

1. L.H. DIRECTIONAL LIGHT
2. UNOCCUPIED
3. GROUNDED TO FRAME
4. R.H. DIRECTIONAL LIGHT
5. R.H. REAR LIGHT AND LICENCE PLATE LIGHT
6. BRAKE LIGHT
7. L.H. REAR LIGHT

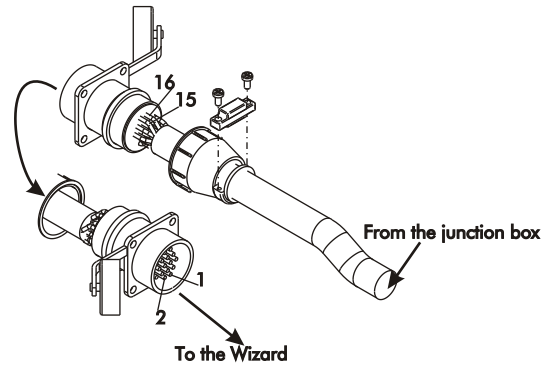


13.5 ELECTRICAL CONNECTORS

16-PIN DATA TRANSFER CABLE CONNECTORS

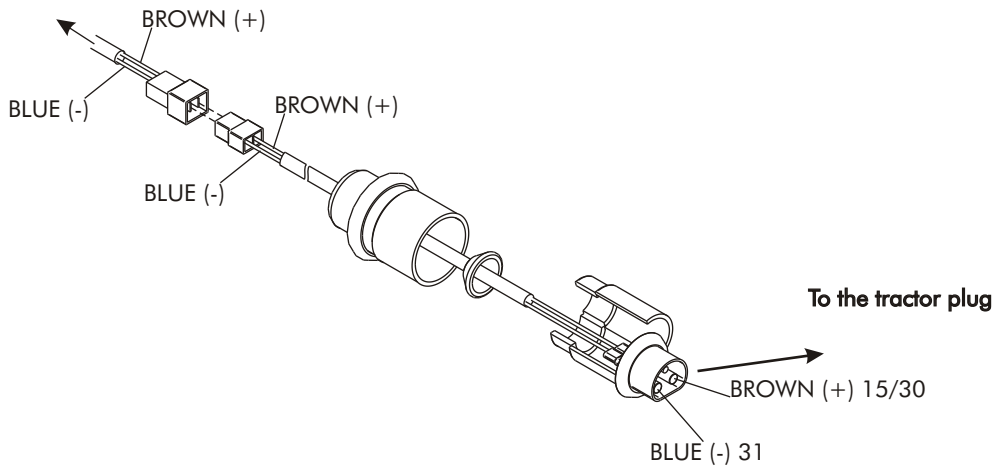


NR	CABLE COLOR
1	RED
2	RED-BROWN
3	YELLOW-RED
4	GREEN
5	VIOLET
6	BROWN
7	WHITE
8	YELLOW
9	TURQUISE
10	PINK
11	BLACK
12	GREY
13	GREEN-RED
14	BLUE
15	ORANGE
16	RED-BLUE

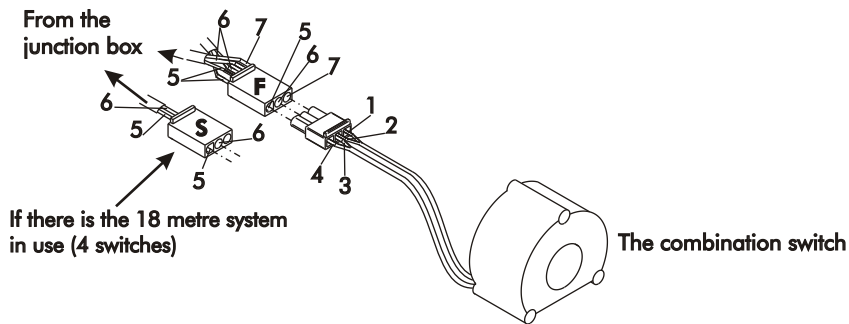


3-PIN CONNECTOR

from the junction box

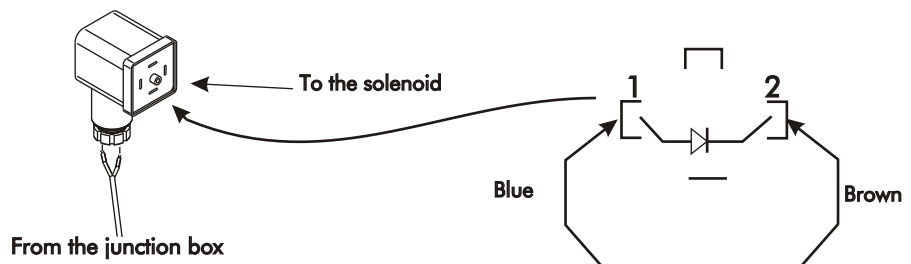


TRAMLINER MARKER CONNECTORS



NR	CABLE COLOR
1	BLACK
2	DARK BLUE
3	PURPLE
4	LIGHT BLUE
5	BROWN
6	BLUE
7	YELLOW-GREEN

THE ROW MARKER SOLENOID CONNECTOR

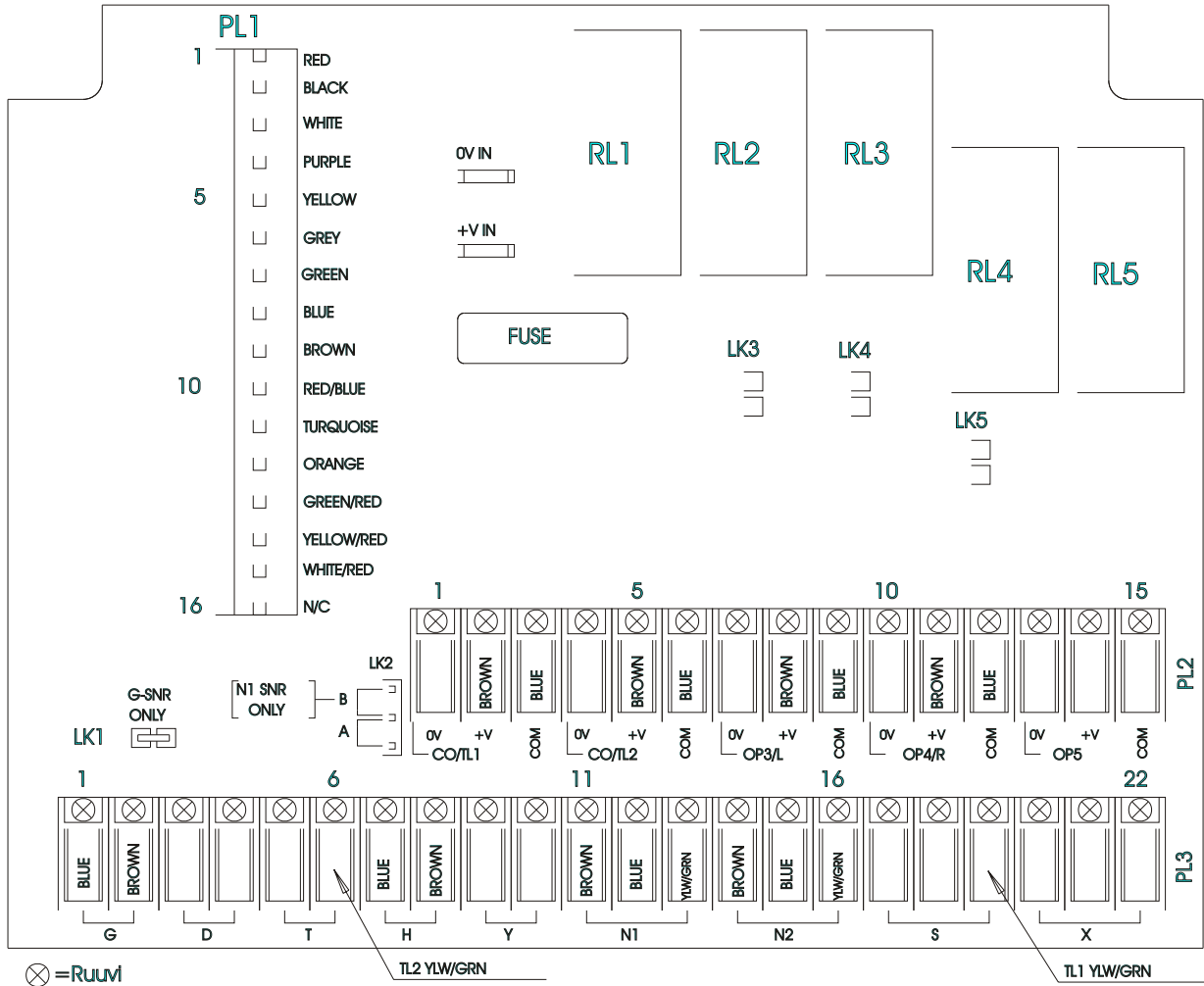


JUNCTION BOX WIRING LABEL, WIZARD



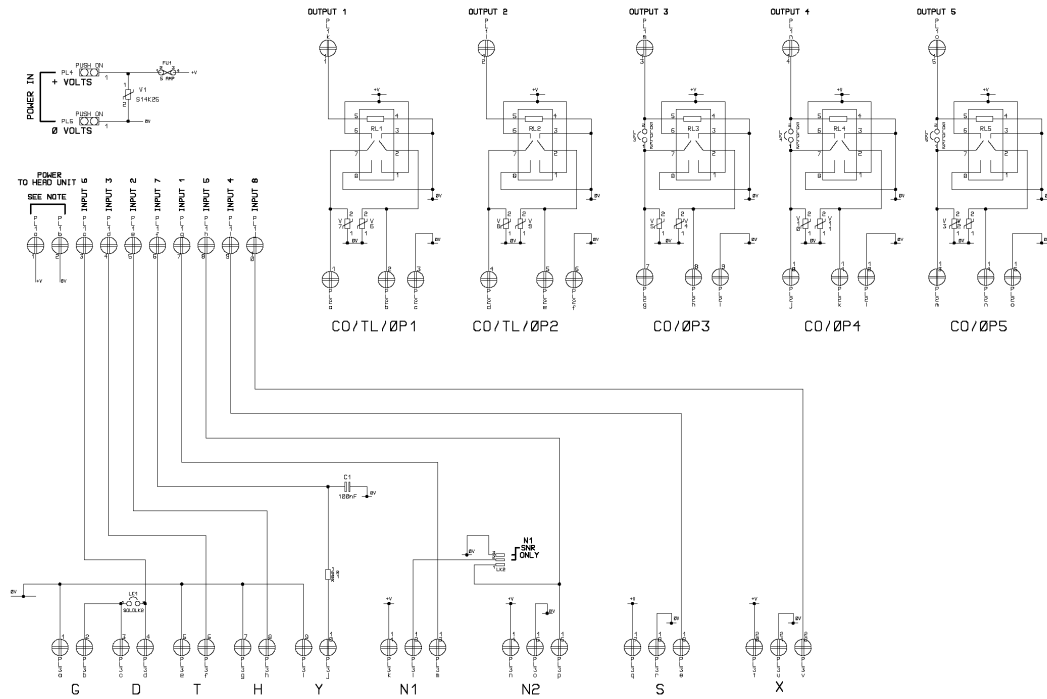
JUNKKARI

Junkkari "2002"
Junction Box
S/AC/306-3-002
WIRING LABEL

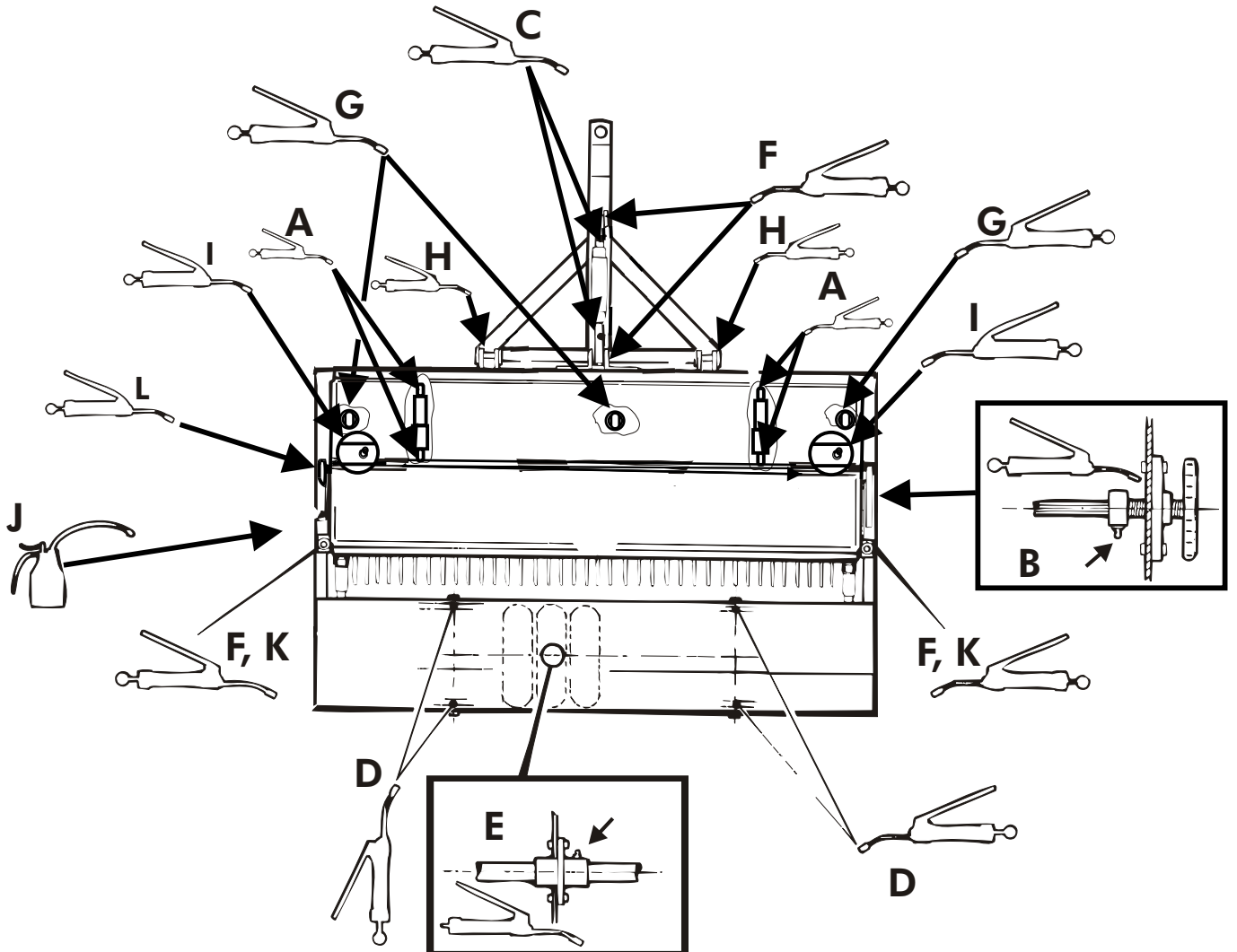


- TL1 TRAMLINE LEFT
- TL2 TRAMLINE RIGHT
- G LIFT SENSOR
- H SPEED SENSOR
- RML ROW MARKER LEFT
- RMR ROWMARKER RIGHT
- N1 HOPPER ALARM, SEED
- N2 HOPPER ALARM, FERTILIZER

WIRING DIAGRAM, WIZARD:



14. LUBRICATION CHART



TARGET (amount of nipples)	S3000
A. Coultter weighting hydr. cylinder ends 4 pcs	Once in a season
B. Feed adjustment 2 pcs	Twice in a season
C. Top link threads 2 pcs	Twice in a season and always after wash-up or getting wet
D. Bogie bearings 4 pcs	Twice in a season
E. Free hub bearings 2 pcs	Twice in a season
F. Height adjustment cylinder ends 6 pcs	Once in a season
G. Zone selector cylinder ends 6 pcs	Once in a season
H. Draw bar frame 2 pcs	Twice in a season
I. Bogie hinge, extended nipples, 2 pcs	Once in a season
J. Drive chains	Daily
K. Height adjustment threads, 2 pcs	Twice in a season and always after wash-up or getting wet
L. Gearing, 1 nipple	Once in a season

The screw threads are to be lubricated with a good quality vaseline or appropriate general lubricating grease. Turn each threaded portion once fully in and fully out after applying the lubricant to spread the lubricant evenly over the whole length of the thread. It is recommended to lubricate the drive chains with biological oil.

15. SPARE PARTS

When ordering spare parts always specify the machine model and the year of manufacture and also both the description and the part no. of each part required.

16. OUT-OF-SEASON STORAGE

16.1 CLEANING FOR STORAGE

The drill is emptied of all seeds and fertilizer. Wash the machine thoroughly both inside and out with clean water. Clean all electrical system components with a clean, damp cloth.



**NOTE! Do not use a pressure washer for cleaning!
Do not spray the electrical system components with water or any cleaning liquids!**

16.2. WINTER STORAGE

When the machine is left unused after an operating season, it should be stored in a covered space after having been cleaned and lubricated. The machine should be cleaned carefully and its paintwork checked after the cleaning. Any scratches or other damage to the paintwork should be repaired by painting over the damaged spots. Carry out a full lubrication routine on the machine. The drive chains should be removed and cleaned in petrol or kerosene and oil-bathed after cleaning.

The calibration test trays are lowered down for storage. To prevent water condensating to the hopper, the hopper cover is left open for storage (machine must be in a covered space) . It is recommendable to place, for example, wooden pallets under the machine to keep coulters off the ground.

The machine will survive the winter period without rusting the best, when it is wiped over with a rag dipped in mineral or vegetable based oil.



Never use other than new, clean oil for rust prevention during winter storage as old, used oils contain sulphur and other combustion residues. These will increase the risk of corrosion in areas not protected by paint. It is also forbidden to use synthetic oils for corrosion prevention.

All of the hydraulic cylinders, except for the weighting cylinders, should also be fully retracted to prevent rusting of the piston rods.

The weighting springs will stay loose, preventing them from deadening, when the weighting cylinder is stored with the rod out. The shiny surface of the cylinder rod is carefully greased. All removable electronic display units and encased control units should be stored separately in a dry and warm environment.

It is also advisable to check the tyre pressures before leaving the machine into storage.

As the storage period of a seed/fertilizer drill tends to be long, careful attention to preparation procedures is especially important with regard to the durability of the machine.

17. VIANETSINTÄKAAVIO

FAULT	CAUSE	REMEDY
Calibration test does not comply with chart values	Faulty adjustment	Check adjustment
	Faulty direction of rotation	Check rotating direction
	Faulty number of turns in the test	Check
	Faulty bottom flap position	Check
	Note the guidance aspect of the chart	Carry out a trial run as necessary
Feed rate lower than calibration test indicates	Calibration test not properly done	Re-test
	Clutch engagement improper	Re-adjust clutch
Feed rate higher than calibration test indicates	Calibration test not properly done	Re-test
	Machine vibration may sometimes increase the flow of seed	Carry out a trial run as necessary
Feed rate varies between individual feed chambers	Bottom flaps in different positions	Adjust
	Feed groove positions in relation to feed chambers vary	Adjust
Electric areal meter does not operate and indicator light is off	Lights not switched on	Switch on parking lights
	Connector corroded	Clean connector
	Broken wiring	Repair
Monitor will not turn on	Voltage is below 8V	Take care that there is enough power reserve, e.g. charge the battery in time.
"BATT" on the display	Supply power below 10V, there is just enough power to show this announcement	Check the condition of the power supply, and make sure that there is enough power available.
"PROG" on the display	The computer memory has been degenerated	Contact the nearest service or the dealer
Monitor flashes during operation	The monitor is not getting speed signal, sensor or magnet loose or chain loose/broken or wire broken	Repair / re-fix
TL1 flashes on the display	Dirt or something on the switch of the seed side, that causes divergent action of the switch	Turn the calibration lever half (1/2) bout clockwise, check the switch and replace if needed.
	The cable is broken	Repair the cable

FAULT	CAUSE	REMEDY
T12 flashes on the display	Same cause as previous, but on the fertilizer side	Same remedy as previous
The display does not show the forward speed	Magnet or sensor bracket loose	Fix the magnet / sensor bracket again
	Broken cable	Repair cable
	Distance between sensor and magnet too wide	Adjust the distance between magnet and sensor
Defect on tramlining	Same cause as previous	Same remedy as previous
Tramline bout does not show or instrument does not count the bouts	The tramlining has been switched OFF	Switch ON the tramlining to appropriate mode
	The tramlining has been stopped	Press STOP to continue tramlining
Area does not show on the display	See paragraph "The display does not show the forward speed"	See paragraph "The display does not show the forward speed"
Incorrect area and forward speed on the display	The sensor calibration was unsuccessfully performed	Re-calibrate the speed and area counter
The hopper level alarm does not alarm even when the hopper is totally empty	The hopper level alarm is switched off	Switch ON the alarm
	The cable is broken	Repair or replace cable
The hopper level alarm alarms continuously	Either the seed or the fertilizer level has dropped below the sensors	Switch off the hopper level alarm when performing the small seed sowing
The hopper level alarm does not alarm	Sensor adj. too close to the bottom, and senses the hopper instead of contents	Adjust the sensor higher
Coulter bent	Coulter struck stone in field or hit other obstacle	Change coulter tube
		Drill and packer have to be both lifted up when reversing
Coulter bent to the side	Coulter struck stone in field	Replace
Pieces of metal chipped off the coulter discs	Coulter struck stone in field	Less speed on rocky ground
Bearing clearances have increased in the coulter system	Turned too steeply with coulters on the ground	Lift the drill up when turning
Soil builds up between coulter discs	Worn discs	Replace
	Sowing to too wet soil	Wait for the soil to dry before sowing
	Too high speed or too much coulter weighting	Slow down speed / adjust coulter weighting
Coulter system is clogged	Too much coulter weighting	Adjust
	Opener disc too high	Adjust
	Wrong choice of sowing method	Change sowing method

FAULT	CAUSE	REMEDY
Too wide gap between plastic support wheel and coulter disc	Too much coulter weighting	Adjust. If the gap is over 8mm, replace wheel
	Working depth adjusted too deep	
The feed system leaks	Too big object in the feed system, for example, clotty fertilizer or a stone	Remove clot or stone, adjust / repair if necessary
	Bottom flap central adj. loose or broken	Adjust / repair
Rear harrow has bent	The harrow has been down during reversing	Repair / replace Drill and packer have to be both lifted up when reversing
	Driven over with tractor while filling hopper	
Chains won't stay on	There is a fault in chain lining, drill driven to an obstacle	Adjust / repair / replace
Tyre smokes	Unknown object in bogie (stone or stub)	Remove object
The hydraulics don't work as supposed	Ball valve is closed	Open ball valve
	Connector loose or unsuitable	Connect, replace with suitable connector if necessary
	Service support down	Lift up the service support

17.1 DEVELOPING FAULTS

The normal operational wearing that takes place in the seed and fertilizer drill processes safely and will cause no dangerous situations.



It should be noted that if the machine is operated in any manner contrary to the highway code or the given safety instructions or if it is overloaded or left without proper maintenance the danger of unusual wear or failure of a component part always exists. This might present a risk of personal injury or environmental damage.



18. WITHDRAWAL FROM ACTIVE USE



READ THE SAFETY INSTRUCTIONS



When the product is withdrawn from active service the responsibility of handling the matter rests solely on the product's end-user or the person or enterprise, in who's ownership the product is at that date.

The disposal of the machine and the various resulting waste materials is governed by national laws, instructions and regulations, which are to be complied with. This applies to all countries, where the product is marketed.

Most of the component parts of a seed drill are of materials, which do not disintegrate in nature. This makes it necessary to disassemble the machine and to dispose of the various materials according to national regulations.

- Steel and other metallic parts are recycled through scrapyards or stripping yards for re-use.
- Waste oil, plastic parts and rubber components, other than tyres, are disposed of as hazardous waste by recycling, taking them to a refuse dump or disposed of by other means according to national regulations.
- Tyres must be disposed of in accordance with the directives 83/189 ETY, 182/88/ETY, 94/10/EY by returning the used tyres to recycling points or to an recycling operator, who will forward the tyres for re-processing.

Environmental authorities will supply further information on handling the scrapping and the resulting waste materials.

19. TERMS OF WARRANTY

TERMS OF WARRANTY:

1. The warranty period is 12 (twelve) months when used for agricultural purposes within the scope of operation to which the machine has been intended for.
2. In communal, industrial or commercial contract work the warranty period is 6 (six) months.
3. The warranty period shall begin from the date of the machine's delivery to the customer by the authorized Distributor/Dealer.
4. The warranty is limited to manufacturing and material defects in the product. The failed part(s) will be repaired or exchanged for reconditioned part(s) either by the factory or an authorized repair workshop. The subcontracted machine components are covered by the respective warranty policies of their manufacturers.
5. A repair carried out and covered by the warranty does not constitute any elongation of the warranty period.
6. The warranty does not cover faults or damages caused by operating practices which are incorrect or contrary to the practices outlined in this manual, by incorrect maintenance, excessive loading or normal wear. The warranty shall neither extend to cover any subsequent damages, down-time, traveling expenses, freight charges, daily allowances, overtime work nor any modification work on the machine's original design.

In matters related to the warranty, please contact your local Dealer, who will prepare a warranty claim on the subject matter. Before any action is taken to correct the fault or defect, the proposed procedure and possible expenses thereof must be agreed with by the manufacturer.

The warranty shall apply only if the warranty registration form is returned duly filled to the manufacturer within 14 (fourteen) days from the date of the machine's delivery to the customer.

20. SCOPE OF LIABILITY

The manufacturer of the product shall not be held liable for the consequences if the said product is used in a way contrary to common law, safety instructions or the instructions contained in this manual. When operating the machine, situations may arise, which are unforeseen and therefore not covered by any specific instructions. The operators are therefore advised in such cases to act according to general, machinery-related safety regulations and directives.

Please note that the incorrect application of fertilizer or seed dressing may prove damaging to people, animals, waterways or soil. Always comply with the instructions given by the manufacturer of the materials or by other experts on the matter to ensure correct handling and application of these substances.

The manufacturer shall not be responsible for any damages caused by incorrectly chosen seed, pesticide or fertilizer for any application. Experts should be consulted for advice if personal knowledge and experience is not sufficient for correct decision-making.

The manufacturer shall neither be held responsible for a poor growth resulting from the use of the product. The operator must keep an eye at all times on the sowing rates for both seeds and fertilizer thus to ensure that the quantity of sown material remains at a level, deemed suitable, in all feed chambers. The operator must also continually observe that the proper sowing depths are maintained.

The manufacturer of the product shall not be responsible for damages caused by the use of subcontracted components.

The manufacturer shall not be responsible for any damages to other machinery and equipment which may be caused by the use of the seed and fertilizer drill.

The manufacturer reserves the right to further develop or alter the construction of the product.

The owner of the seed and fertilizer drill shall be held responsible to oversee that each and every person operating the machine has acquainted himself/herself with the operating and safety instructions outlined in this manual and fully understood all such instructions.

