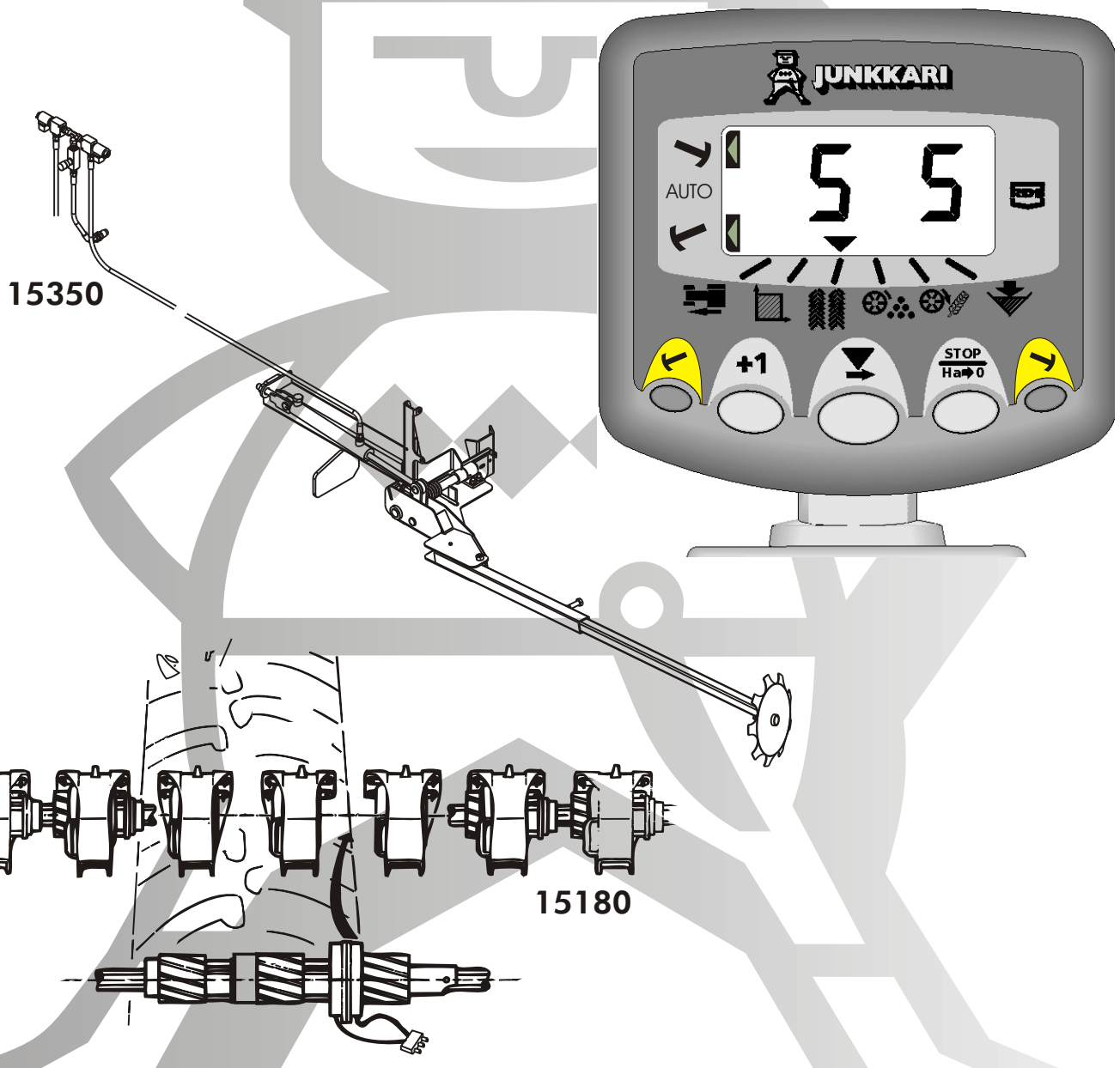
JUNKKARI

WIZARD- MULTI-FUNCTION DRILL CONTROL WITH TRAMLINE MARKER AND ROW MARKER FOR JUNKKARI SIMULTA SEED AND FERTILIZER DRILL



OPERATOR'S MANUAL

wiz_ENG04

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ENGLISH 2004 CE

Electro - Magnetic Compatibility (EMC)

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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.

NOTE !

This book is a supplement to the operator's manual of Junkkari Simulta seed and fertilizer drill.
Following instructions concerning Junkkari Simulta

4. SAFETY INSTRUCTIONS
6.3 OPERATIONAL LIMITATIONS AND FORBIDDEN FORMS OF USE
8 TRANSPORTATION, HANDLING AND STORAGE
9.1 PREPARATIONS PRIOR TO OPERATION
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14 MAINTENANCE
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17 TROUBLESHOOTING CHART
17.1 NORMAL WEAR AND TEAR
18 WITHDRAWAL FROM ACTIVE USE
19 TERMS OF WARRANTY
20 SCOPE OF LIABILITY

concern also this machine.

Acquaint yourself with the operating and safety instructions of the seed and fertilizer drill before starting installations and operation.

2.2 TECHNICAL SPECIFICATIONS

TYPE----------	JUNKKARI HYDRAULIC ROW MARKER
WEIGHT----------	48 kg
COUPLING TO TRACTOR HYDRAULICS----------	ONE SINGLE ACTION OUTPUT, STANDARD ISO 5676 COMPLIANT BAYONETS
WORKING PRESSURE OF THE HYDRAULIC SYSTEM---	210 bar

3. GENERAL INFORMATION

3.1 OBJECTIVE OF DESIGN, APPLICATIONS AND PRINCIPLE OF OPERATION

Wizard

The Junkkari Wizard multi-function drill control has been designed to facilitate usage of the Junkkari Simulta seed and fertilizer drill and it's equipment.

The Junkkari multi-function drill control has an illuminated4-digit display with 6 display functions for :

Forward speed km/h
Area worked (part and total area)
Bout count and tramline bouts
Row marking
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 Junkkari multi-function drill control has no other applications than these mentioned in this booklet.

This product complies with Council Directive 89/336/EEC when installed and used in accordance with the relevant instructions. Our policy is one of continuous improvement and the information in this document is subject to change without notice. Check that the software reference matches that displayed by the instrument.

RDS Document number
S/DC/500-10-269 Issue 1: 12/12/00
\UK269-1.DTP

Tramline marker

The tramline marker has been designed for the Junkkari Simulta seed and fertilizer drills to mark out a tractor path for pesticide spraying.

The tramline marker has no other applications.

The tramline marker marks out a path for tractor to help the pesticide spraying operation later during the season. The path is marked out by closing two + two seed spouts during the tramline bout only, the width between seed spouts is chosen by the track dimension of the tractor used for spraying.

Row marker

The hydraulic row marker has been designed for the Junkkari Simulta seed and fertilizer drills to mark out the center of the tractor path.
The row marker is suitable as it is to Simulta T- and ST-models from the model year 2002, with other models, please contact your nearest dealer.

The hydraulic row marker does not have any other applications.

The row marker gets it's hydraulic pressure from the hydraulic line of the machine lifting. The Junkkari Simulta seed and fertilizer drill has a factory-assembled female bayonet for connection of the row marker hydraulic system.
The row marker controls and operations are done from the tractor cabin by using the Wizard multi-function drill control. The row marking mode is chosen from the Wizard, there are four different ways how to drive. You can choose a manual operation mode, deciding either right or left side marking or simultaneous marking of both sides, or an automatically controlled mode, when you choose the side to start from.
Marker arms will lower and rise, due to chosen program, simultaneously with the drill.
At the end of the marker arms are the rotating wheels, which will make a mark to the field when touching the surface.

The row marker has two hydraulic cylinders, one at each side, to lift up the marker arms when the drill is lifted up. The marker arms are lowered by the spring, the hydraulic system will limit the speed of the lowering.
The adjustable restrictor valve limits the lifting speed when the drill is lifted up.

3.2 PREPARATIONS PRIOR TO OPERATION

Package

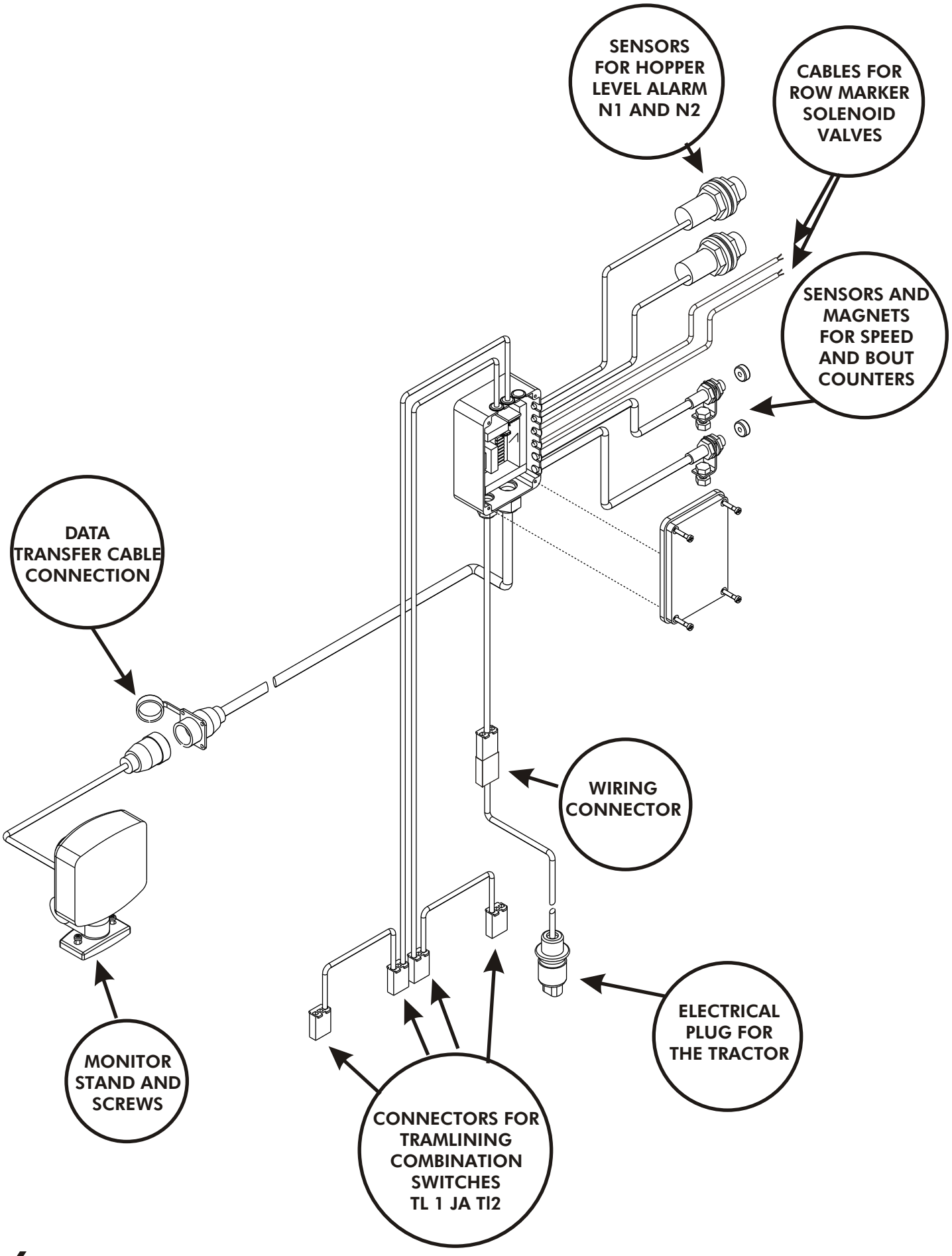
Dismount the package and dispose packing materials due to point 9.3 in the Simulta manual.

The tramline marker is packed to one parcel in full, with all fittings required.

The hydraulic row marker is packed as follows :

- Left side turning unit, locked with a linch pin *(do not remove)*
- Right side turning unit, locked with a linch pin *(do not remove)*
- Left side extension arm and wheel, assembled
- Right side extension arm and wheel, assembled
- Hydraulics and couplings
- Instruction manual
- Warning stickers and plates
- Bag of fittings and accessories

4. INSTALLATION



4.1 INSTALLING THE MONITOR

WIZARD multi-function drill control is installed to the tractor cabin so, that it is directly on the driver's field of vision when driving forward.
The drill control stand will be installed on it's place with two screws. When placing the monitor, pay attention to driver's movement in the cabin to avoid touching the device unintentionally.

Note, that the device must not be placed near by any LA- or cellular phones. Wizard drill control must not be connected to the same circuit with other electrical equipment.

CONNECTING THE ELECTRICAL WIRING

Connect electrical wiring connector to a corresponding connector from the junction box, the three-poled plug is connected to the corresponding socket in the tractor. If the tractor is not equipped with such socket, it is recommended to fit it. This cable will supply all power to the system, so it is recommendable to secure the circuit with a 10 Amp fuse.

CONNECTING THE DATA TRANSFER CABLE

There is only one data transfer cable leading from the Wizard to the junction box. This transfer cable has a 16-pole socket and that is connected to the corresponding plug from the junction box, and will be transferring data from the drill to the monitor.

The power must be switched off from the whole system during all cable work.

4.2 INSTALLING THE JUNCTION BOX AND THE SENSORS

INSTALLING THE JUNCTION BOX

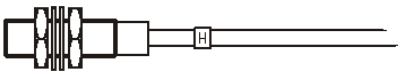
Install the junction box to the drill with screws provided with the machine. The Junkkari Simulta drills from year 2002 will have assembly holes factory made. Cover the wiring harnesses from the junction box with plastic spiral.

INSTALLING THE SENSORS FOR HOPPER LEVEL ALARM

The cables are identified and placed as follows (see collar on the cable) :
N1 = seed hopper, N2 = fertilizer hopper.
The sensors are located ca. 150 mm above the bottom of the container, one at each side.
Assembly holes for the sensors are factory made to the year 2002 T- and ST-models.
The installation is done by drilling a hole, size of the sensor's threaded end, to the container side.
Place the sensor through the hole and tighten with the sensor's plastic nut.

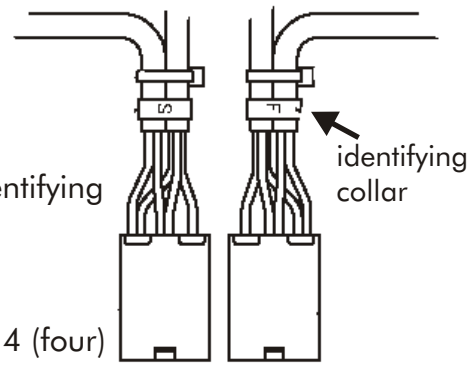
INSTALLING THE SENSORS AND MAGNETS FOR THE SPEED AND BOUT COUNTERS

Sensors for the speed and bout counters are installed with a sensor mounting.
The sensors are identified as follows (see identifying collar on the cable): G = tramlining bout counter, H = speed and area counter.
Location of the sensors : Speed and area counter sensor is fitted to the end of the seed distribution shaft, tramlining bout counter sensor to the end of the right hand side bogie arm.



There are 2 magnets for the speed and area counter sensor and one for the tramlining bout counter sensor. The magnets are secured with screws, be careful not to tighten the screws too much, the magnet metal is friable and will damage easily.

CONNECTING THE TL1 AND TL 2 ELECTRIC CABLES



The TL1 cable connector identified with letter "S", is connected to the combination switch installed to the seed distribution shaft, and the TL2 cables are connected as the TL1 cables, follow the identifying collars on the cables.
NOTE : If you have the 18-metre system in use, the connector identified with letter "F", is connected to the combination switch installed to the fertilizer distribution shaft, and then you must have 4 (four) combination switches, 2 in the seed distribution shaft and 2 in the fertilizer distribution shaft.

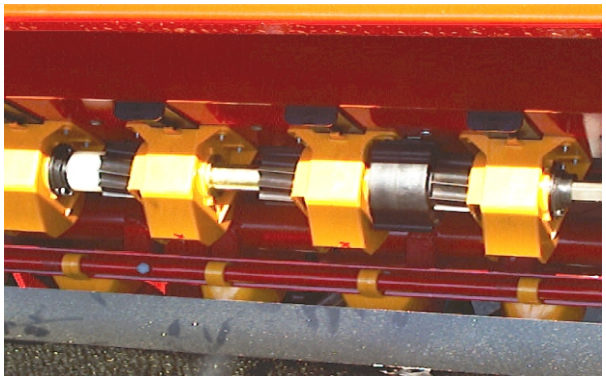
The placement of the combination switches depends on what is the relation between the tractor and the pesticide sprayer. Follow the specific installations done to your seed and fertilizer drill.

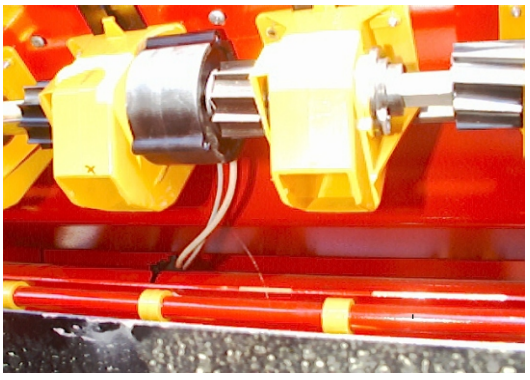
4.3 INSTALLING THE DISTRIBUTION SHAFT COMBINATION SWITCHES

COMBINATION SWITCH (seed spout closing switch and rotation sensor)

The attachment of the combination switches is done as follows. The wiring harness is placed and fixed to the spout shafts with cable ties as in the pictures below. Note, that the spout shafts must be able to move to get the calibration test done.
The combination switch is also moved by the adjustment of the feed, and that movement should also be notified when fixing the cables.

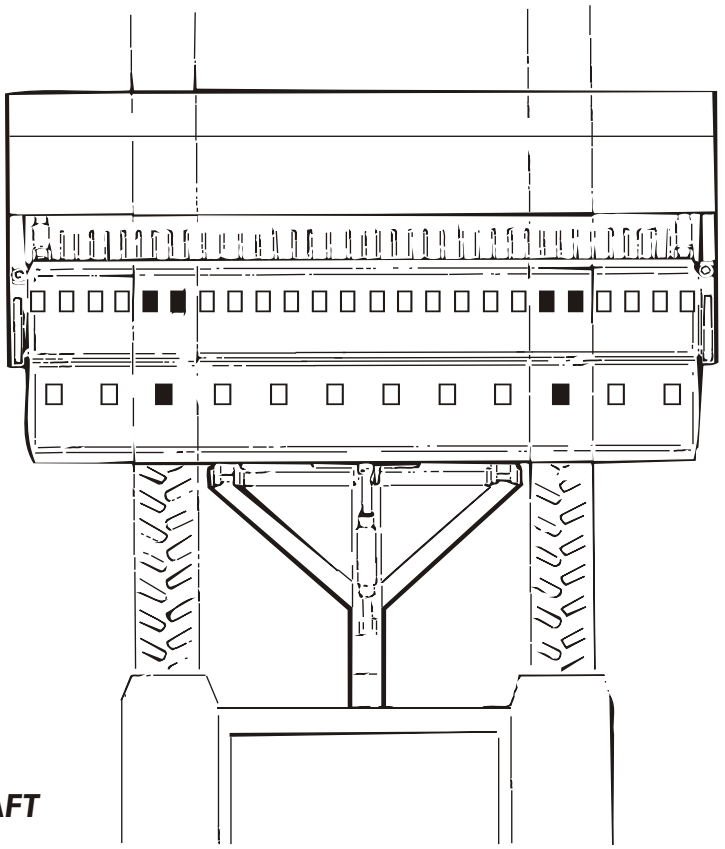
Take care that all cables are fitted to the correct sides of the machine to ensure accurate functions of the Wizard.
The wiring for the switch can't be connected to the rotation sensor and vice versa when using the original connectors that are made so, that they can't be connected incorrectly.





INSTALLATION

The tramline marker is installed in the factory.
For retrofitting, the installation requires that some standard parts must be altered. Alteration is quite easy and all information needed to do that are described here.

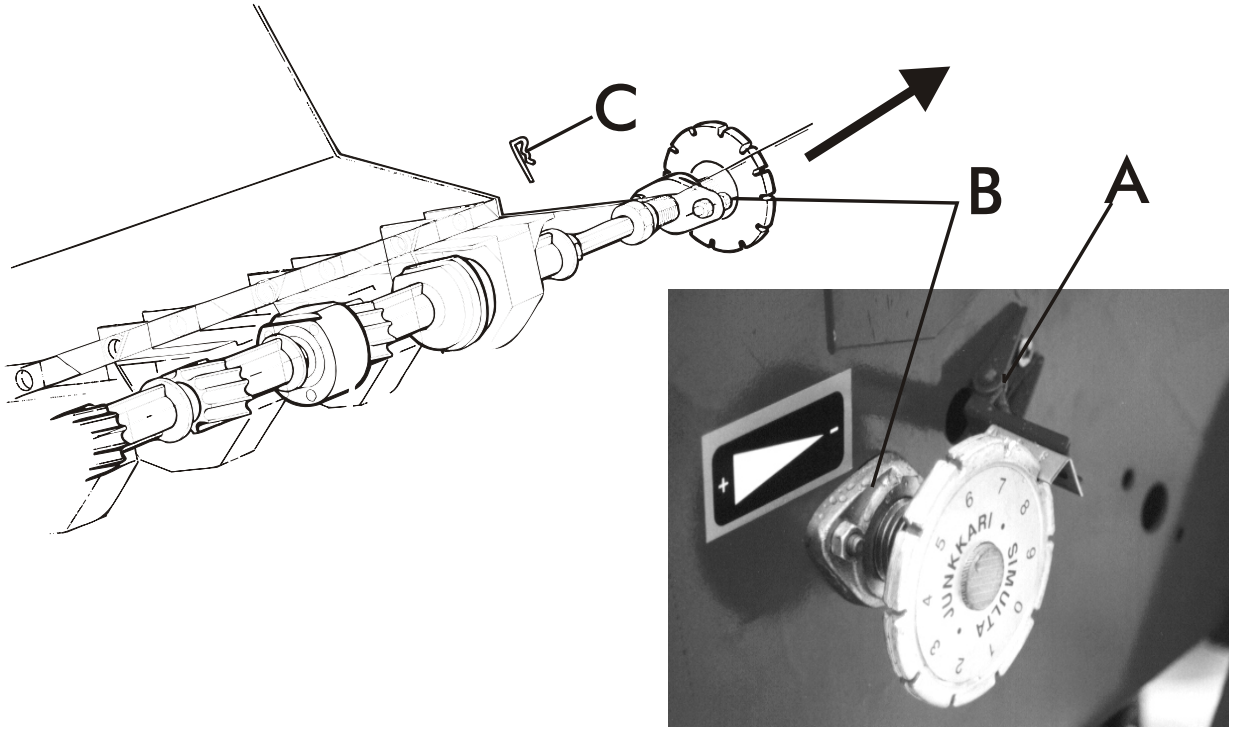


TRACK

At first you measure the track of the tractor used for pesticide spraying, and mark out the feed chambers of the drill in which the combination switches will be installed. (refer to the illustration)

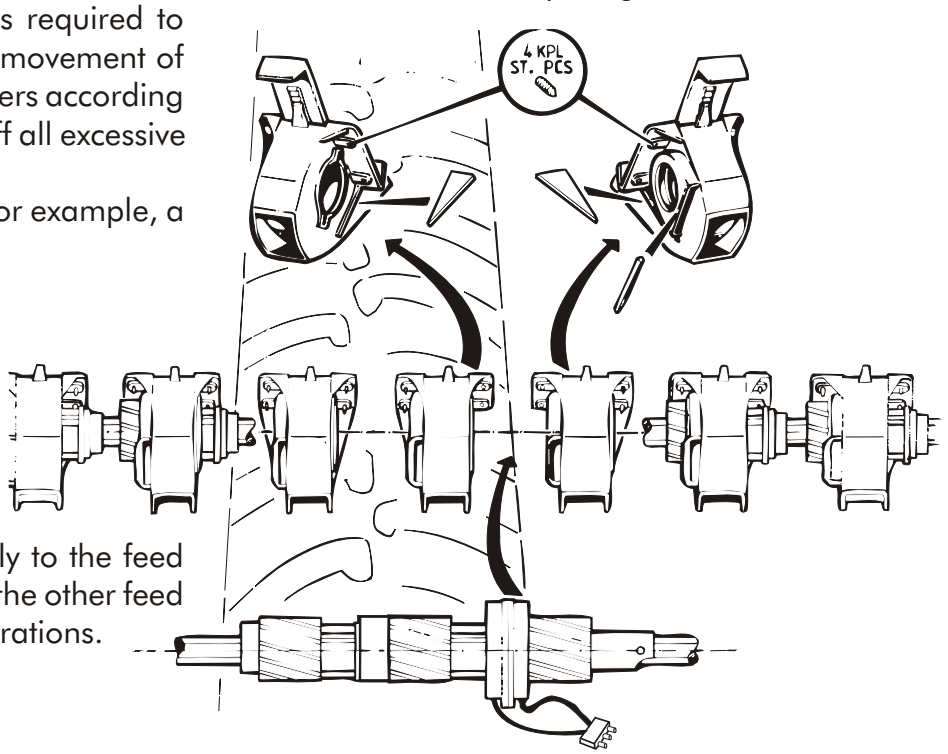
DISMANTLING OF THE DISTRIBUTION SHAFT

At first, lower the calibration test troughs into the test position, so all falling parts will end to the troughs while dismantling the shaft.
Remove the feed adjustment clamp A from the distribution shaft (refer to the illustration below). After that, remove the feed adjustment frame nut B at the face of the machine. The frame nut is fixed to the face with two M8 screws.
All feed roller retaining pins C are removed from the distribution shaft, there are 20-32 pcs of pins depending on the Simulta model. Carefully pull out the distribution shaft, far enough to be able to change new parts to all marked chambers. NOTE, that to prevent damaging the distribution shaft, the shaft must be supported while pulling it out.
When pulling out the distribution shaft the feed rollers and seals usually stay inside the feed chambers. In that case it is recommendable that the feed rollers are removed only from those chambers that will be fitted with new parts.



FITTING THE COMBINATION SWITCHES

When equipped with standard distribution equipment, the Junkkari Simulta seed an d fertilizer drill will require some special alterations to fit the distribution stop switch into it's place.
The distribution of the Simulta is adjusted by changing the effective length of the feed roller, then the whole distribution shaft is moving, and because of that, the switch will require all the space between feed chambers and it needs to be able to move from min to max while adjusting the distribution.
As a consequence of that, it is required to remove the ribs that resist the movement of the switch from the feed chambers according to the picture below. Also cut off all excessive length from the fixing screws.
This work can be done using, for example, a hack saw.



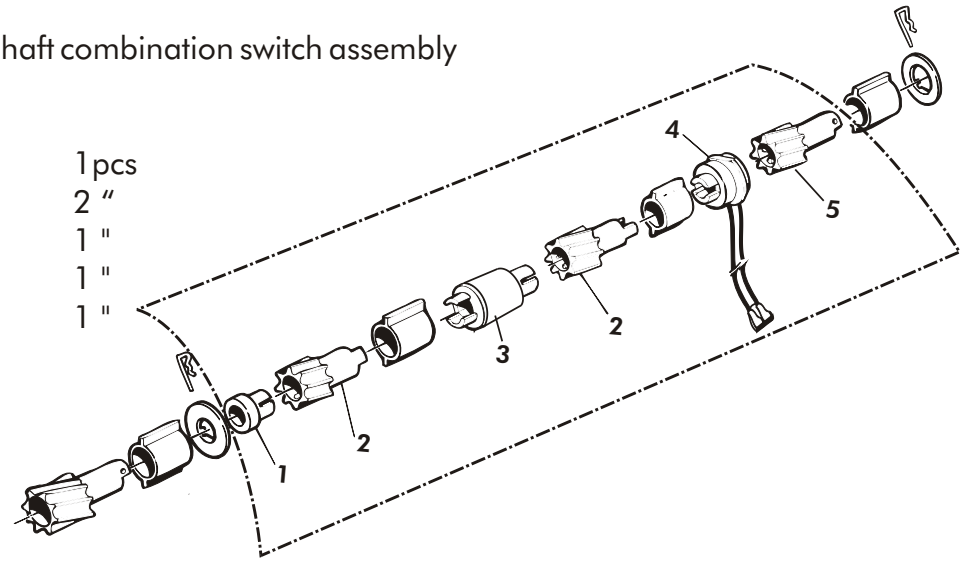
These alterations are done only to the feed chambers beside the switches, the other feed chambers do not need any alterations.

INSTALLING THE COMBINATION SWITCH ASSEMBLY

The combination switch assembly (refer to illustration above) can be installed after the alteration done to the feed chambers, , order of the parts as in the illustration below.

Parts for the seed distribution shaft combination switch assembly
(one assembly / wheel)

1.	End bushing	1pcs
2.	Feed roller	2 "
3	Drive bushing	1 "
4	Combination switch	1 "
5.	Free feed roller	1 "



INSTALLING THE DISTRIBUTION SHAFT

The distribution shaft can be installed back to it's place after the combination switch assembly has been installed. Take care during the installation that all feed rollers are placed correctly and the retaining pin holes are in position. Note when putting the switch assembly together to fit claw couplings correctly.

This installation will be easy to carry out if there are two people performing it. The other will assemble the parts to the shaft and check that all parts are positioned correctly, while the other pushes the shaft back to its place.

4.4 INSTALLING THE ROW MARKERS

Start the installation of the row markers by attaching the hydraulic components ; the valve mounting, valve pack and cover, hoses and the hydraulic cylinders to the face of the seed and fertilizer drill. The assembly screw holes are drilled at the factory to the face of the drill, remove covering plastic caps, use screws and nuts provided with the machine.
Fix hydraulic hoses by clamps enclosed to welded hose mountings in the drill, ensure that the hoses won't be damaged during the use of the machine.
The hydraulic cylinders are attached with a yoke to the mounting bracket in the drill (see fig. 3. next page), place nuts to both sides of the bracket for the adjustment.

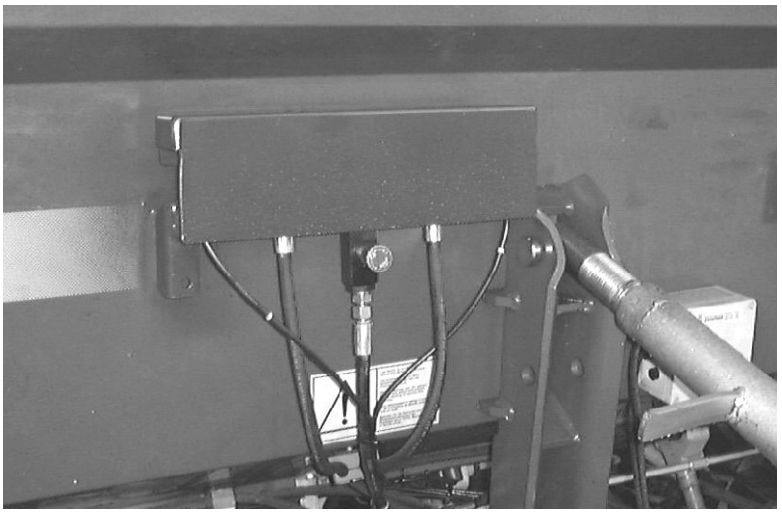


Fig.1. Placement of the valve pack and cover.

Install turning units to the sides of the drill with screws and nuts enclosed, the assembly holes are factory made to the drill (see fig. 2.).
Note the drive direction to fit the parts to correct sides (see fig. 3.).

NOTE

The turning unit is delivered fixed to transport position with a linchpin. Engage hydraulic cylinder and pressurize the system before removing the linchpin, the spring will otherwise make the arm drop down quickly causing immediate risk of injury.

UNLESS THE CYLINDER IS PRESSURIZED, THE TURNING UNIT RESTS AGAINST THE LINCHPIN, AND IN THAT CASE REMOVING THE PIN CAUSES A DANGER OF INJURY.

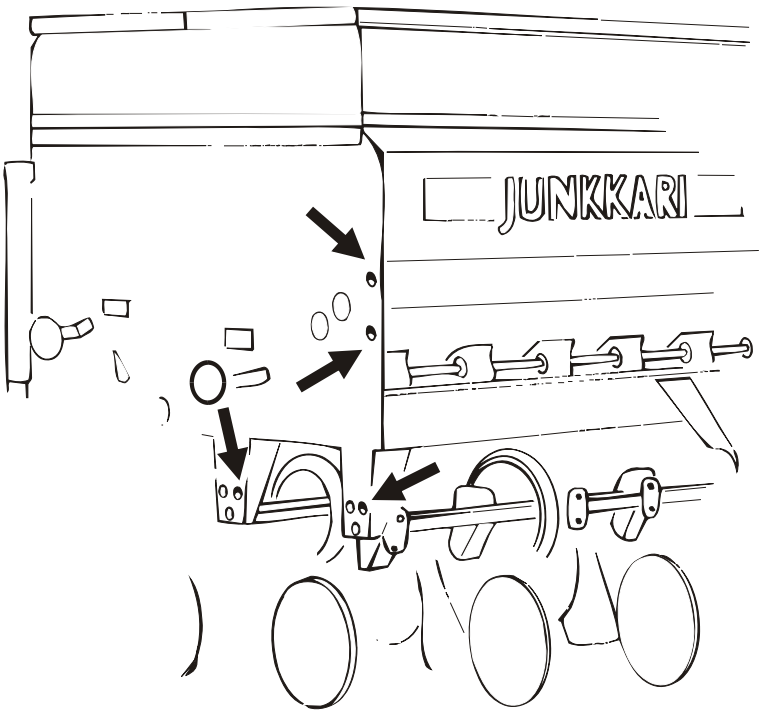
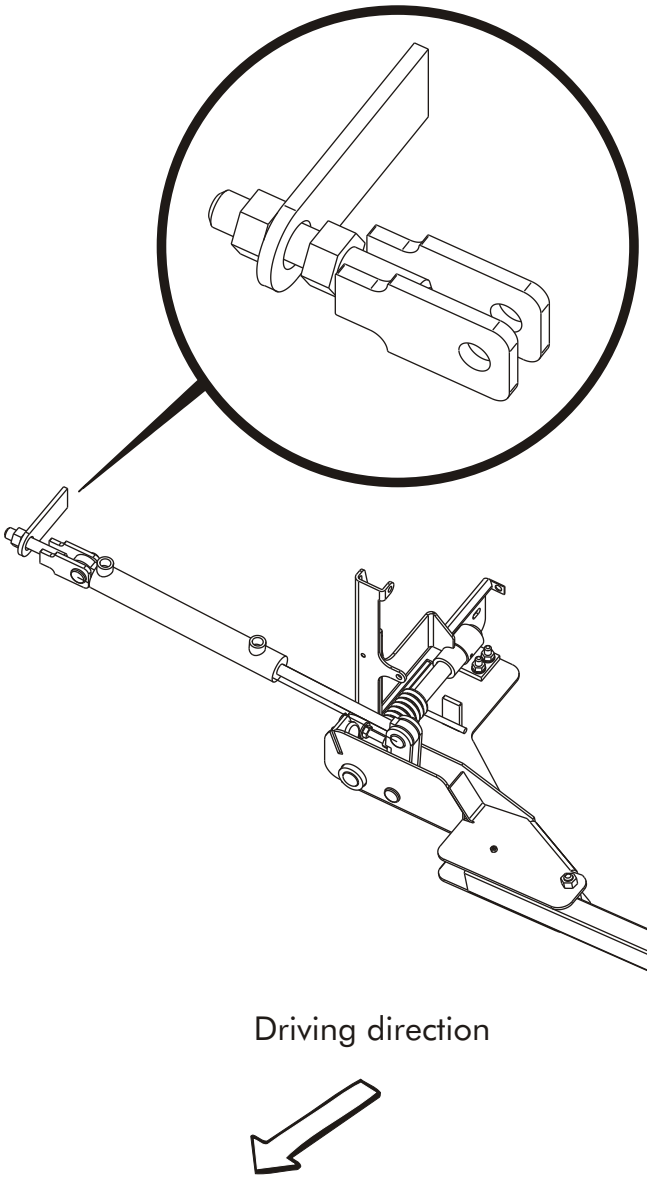


Fig. 2. Assembly holes for the turning unit at the side of the drill.

When all hydraulic components and turning units are installed to the drill, the extension arms and marker wheels can be assembled to turning unit arms.
Use screws and nuts provided with the machine to assemble parts, note the driving direction, the wheel must stick out compared to driving direction (see fig. 3.).

First assemble the wheels to the extension arms. Then assemble extension arms to turning units by passing the extension arm inside the turning unit arm and tighten to required length with retainer screw (see fig. 3.).

WHEN REMOVING THE LINCHPIN, ALWAYS EXERCISE EXTREME CAUTION



Adjust the hydraulic cylinder yoke to keep the marker resting against the cylinder when the it is in its shortest position, not against the turning unit. The linchpin is also then easy to remove. The yoke is locked after the adjustment by two nuts to the position where the hydraulic connection is upwards. (see fig. 3)

NOTE !
The marker wheel should stick out comparing to the driving direction.

the retaining screw of the extension arm

Driving direction

The wheel should rotate freely.
The screw must not be tighten too much.

Fig. 3. The row marker assembly

HYDRAULICS

The row marker is coupled to the seed and fertilizer drill hydraulics by a factory assembled bayonet in the drill. This way the row marker will function automatically due to the chosen row marking program, lifting and lowering the marker arms when the drill is lifted or lowered.

The row marker is provided with ready-made hose assemblies, valve pack, hydraulic cylinders and all needed fittings. The valve pack consists of a restrictor valve and two electrically controlled 2/2 directional valves.

The two electrically controlled 2/2 solenoid valves are to control the row markers side changing through the Wizard. When all hydraulic components are assembled, connect the control wiring from the Wizard to the two-way directional valve solenoids.
The Wizard control wiring for the solenoids consists of two cables, brown and blue, in black covering, one per side, for left and right marker. The cables are marked with identifying collars, L=left and R=right.
Connecting the wiring to the solenoids, see page 40 : **ELECTRICAL CONNECTORS; Row marker valve solenoid connectors.**

It is recommendable to do some operating moves with the machine to test the functions and make the eventual air from the system to drain out.

See assembly illustration below and the instructions for the row marker speed adjustment on next page.

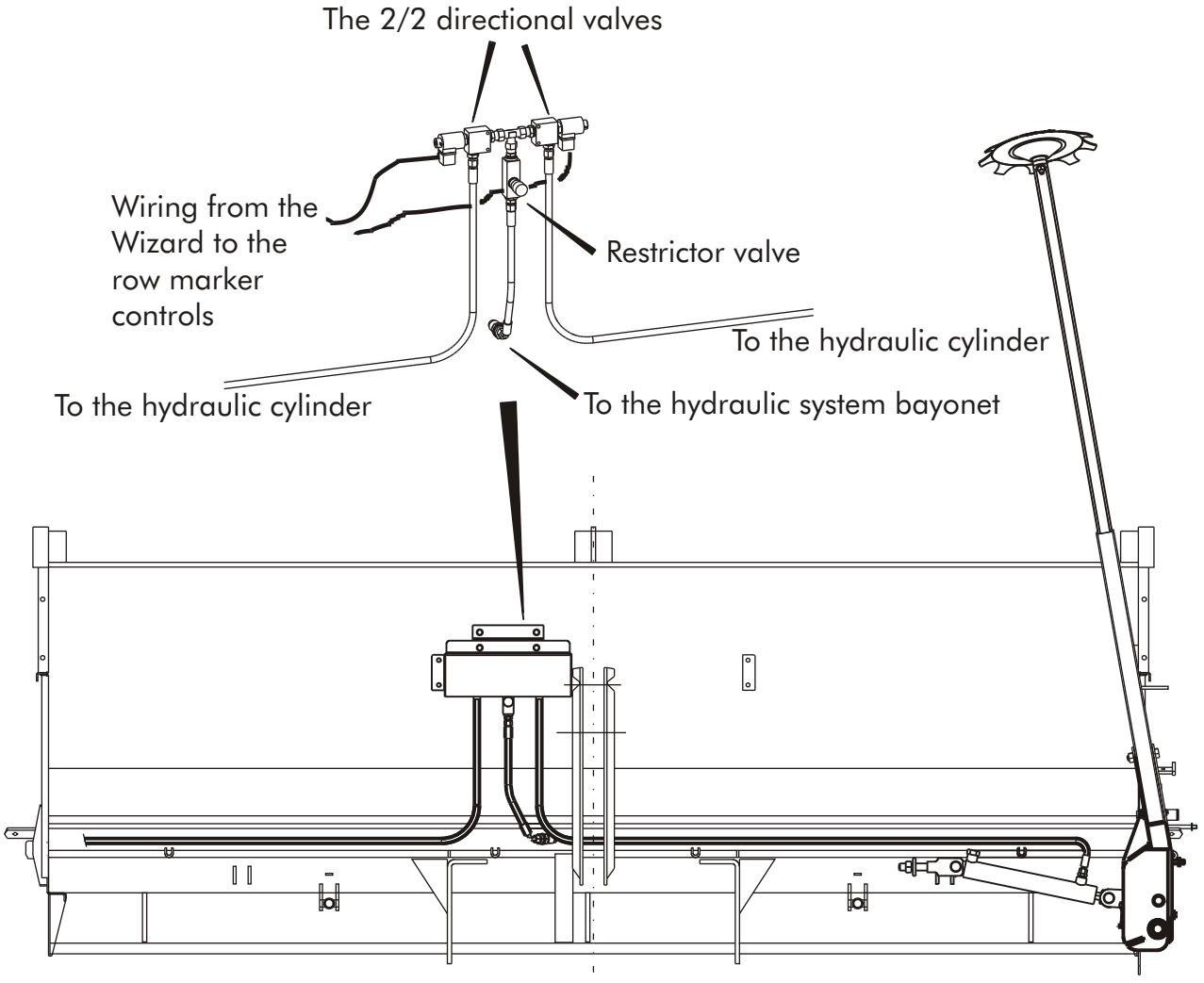


Fig. 4. The assembly of the row marker hydraulics to the seed and fertilizer drill

ADJUSTMENTS

Working width

When the row marker has been assembled to the drill, the marking width can be adjusted by adjusting the length of the extension arm. The adjustment is done by loosening the retaining screw from the turning unit arm and moving the extension arm in or out to the required width. When the adjustment is done, tighten the retaining screw lo lock the extension arm to its position. The marking width is the same as the working width. Measure the width from the center line of the machine to the marking wheel. (Fig. 5).

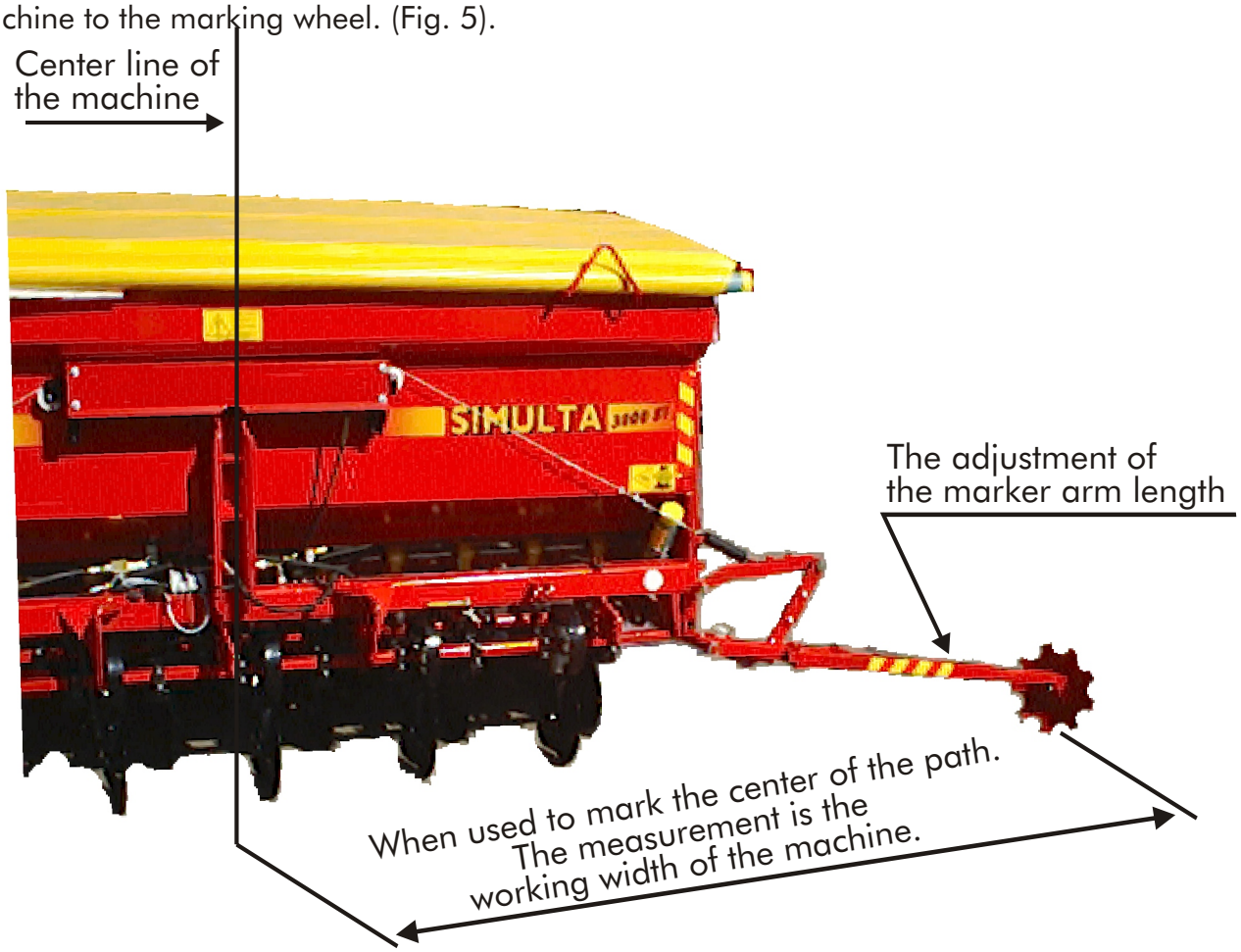


Fig. 5. The working width adjustment

The marker arm bumper adjustment

To prevent damages caused to the turning unit and the hydraulic cylinder by sudden downwards movement of the marker arm, there is an adjustable bumper in the hydraulic cylinder mounting of the turning unit. The bumper will prevent damages in situations, for example, when driving close range to the ditch bank and the marker suddenly "falls on top of nothing".
The bumper is adjusted by opening the lock nut and turning the retaining screw to the required length, and locking the position with the lock nut again.
Note : If the retaining screw is too far out, the marker might be too high on the working position and the marking weakens.

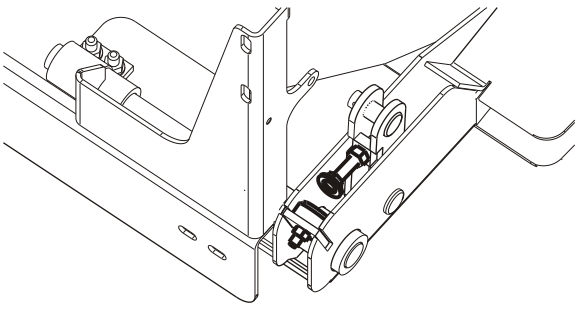


Fig. 6. The marker arm bumper

ADJUSTMENTS

The row marker arm speed adjustment

The lifting speed of the marker arms is adjusted by the restrictor valve. The lowering speed is limited by the oil returning from the hydraulic cylinder and running freely through the restrictor valve.
The row marker hydraulic system flow can be adjusted to fit the tractor hydraulic system oil flow with the restrictor valve. The flow is adjusted correctly, when the movements are smooth and sudden moves are no danger to the machine.
Note, that the hydraulic oil flow is highest when the oil is warm, and the hydraulic pump output is at its maximum level at high tractor engine speed.
The restrictor valve restricts the flow only to one direction, the restriction is adjusted from the adjusting knob on the valve.
The restriction adjustment is done by loosening the lock screw (tiny allen screw at the side of the knob) on the adjustment knob and the valve is fully closed. Then pressurize the hydraulics by switching on one of the row markers from the Wizard and lowering the drill. Then start turning the adjustment knob observing the movement of the chosen row marker arm, and when the movement speed is adequate, lock the knob with the lock screw on this position. The speed is adequate, when the lifting is as fast as the lowering.
This adjustment is tractor-specific.

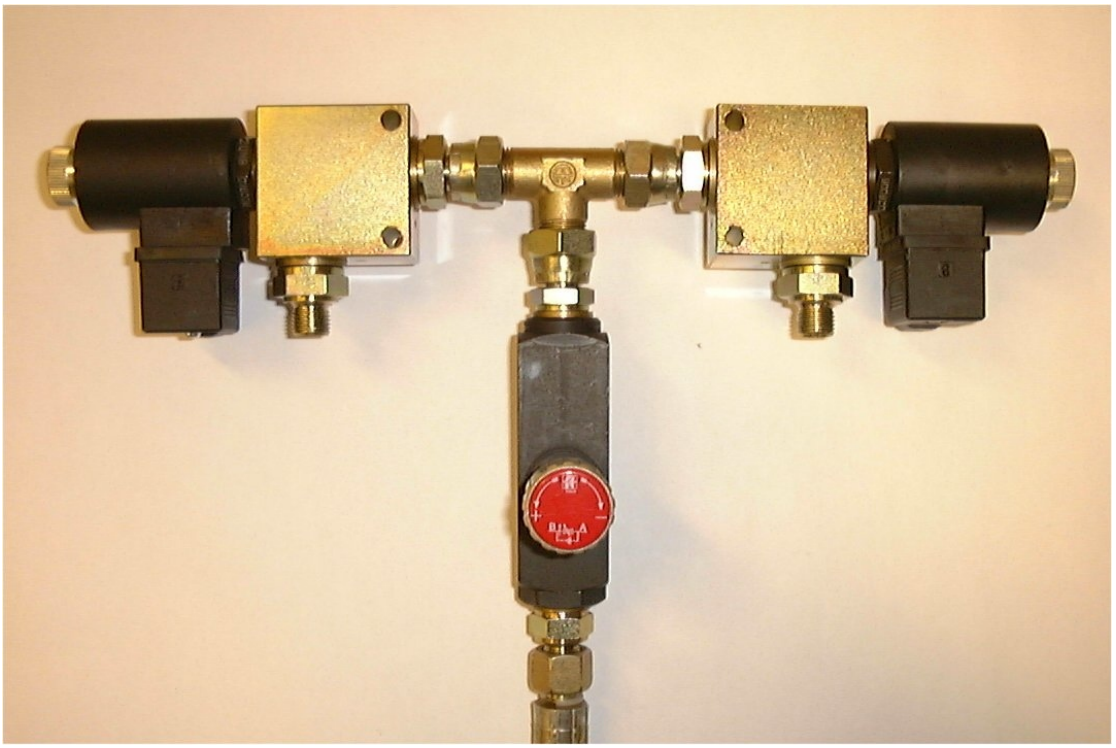
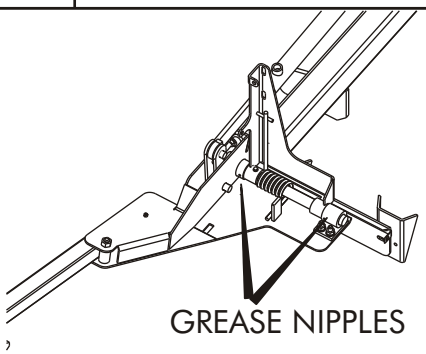


Fig. 7. The adjustable restrictor valve and two 2/2 directional valves with solenoids

LUBRICATION CHART

TARGET	LUBRICANT	MAINTENANCE INTERVAL
the turning unit hinge sliding bearings, 2 kpl	Vaseline	At the beginning and at the end of the season after washing the machine



GREASE NIPPLES

WARNINGS AND WARNING STICKERS

BEFORE STARTING THE ASSEMBLY WORK, ALWAYS MAKE SURE THAT THE HYDRAULIC SYSTEM IS UNPRESSURIZED AND THE DRILL IS LOWERED TO THE GROUND.

THE MOVING SPEED OF THE HYDRAULICS IS DANGEROUSLY HIGH WHEN UNADJUSTED OR ADJUSTED INCORRECTLY.
BEWARE OF THE FAST MOVING MARKER ARMS.

See also Junkkari Simulta operator's manual : 4.3 Maintenance and repairs and 4.4 Hydraulics

Attach the warning stickers provided with the machine according to picture below.

Danger of crushing !

Beware of the lowering marker arms !
Beware of the power lines !

USAGE

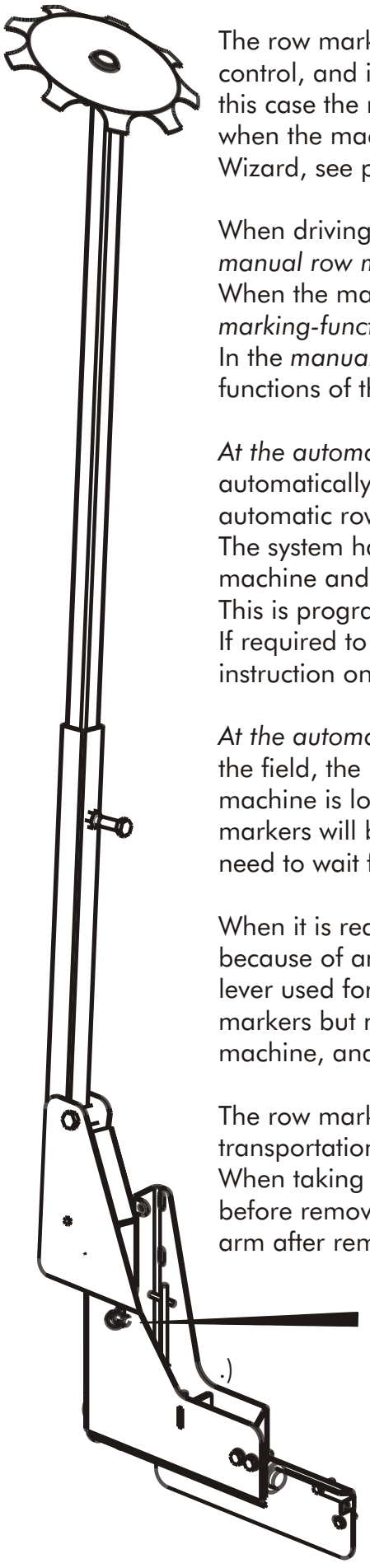


Fig. 8. The turning unit at transportation position

The row marker is always operated with the Wizard multi-function drill control, and it is coupled to the seed and fertilizer drill hydraulic system. In this case the row marker arms are always lifted and lowered automatically when the machine is lifted or lowered. The exact description in use of the Wizard, see pages 34-35, chapter 6.7 Row marking

When driving circle at the field, e.g. starting from the outer border , use the *manual row marking-mode*, switch on the inner row marker.
When the marks are required to both sides of the machine, use *manual row marking-function* and switch on both markers.
In the *manual row marking-mode* lifting of the drill does not affect the functions of the row markers.

At the automatic row marking-mode, left and right side markers alternate automatically due to programming, when driving the field back and forth, the automatic row marking can be started on the right or the left side of the drill. The system has to sense the change of the driving direction from the lifting machine and it has to "know" which side of row marker has to be laid down. This is programmed with the Wizard.
If required to lift the machine without affecting the row marker counter, see instruction on chapter **6.7 Row marking, 4. Lifting the drill**

At the automatic row marking-mode, when the drill is lifted up at the end of the field, the markers will be lifted up along with the machine. When the machine is lowered down, the driving can be continued immediately, the row markers will be lowered automatically within 5-10 seconds delay, there is no need to wait for them.

When it is required lift the marker / markers up for a little while, for example, because of an obstacle, it can be done by lifting the markers up using the lever used for lifting the machine, shifting the lever just enough to lift the markers but not the drill. (The Wizard will not recognize this as a lift of the machine, and it does not affect the automatic row marking).

The row marker arms must be lifted up and locked with a linchpin for the transportation, to prevent causing danger to the machine or the environment. When taking the machine into operation, always couple the hydraulic system before removing the transportation linchpins. Beware of the lowering marker arm after removing the linchpin. (Fig. 8.)

5. 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.

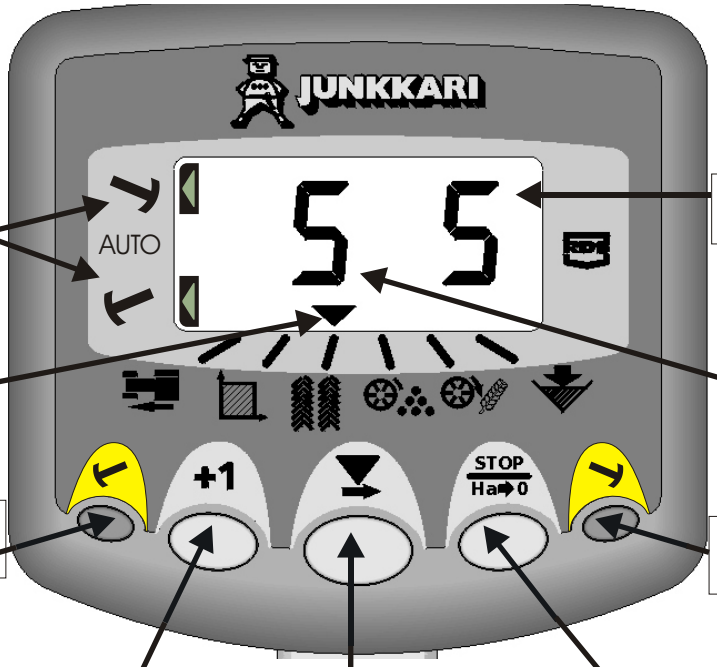
Function	**Programmable value**	**default setting** (Wizard)	**default setting**	**default setting** (User)
1. Km/h	Wheel circumference*	2.000m	c.a. 1.32	----------
2. Ha	Working width	2.000m	machine width	----------
3. Tramline	Tramline marking	Sy.04	Sy/Al/Ar/18m/OFF	----------
4. Fert. shaft speed	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 **STOP Ha→0** to start automatic speed calibration. Press **STOP Ha→0** 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	-	-	----------

6. OPERATING SUMMARY



Symbol for row marker

Channel indicator

Button for left side row marker controls

Tramlining bout

Current bout

Button for right side row marker controls

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 STOP Ha→0 to override automatic advance of bout number if drill is lifted (press again to resume)

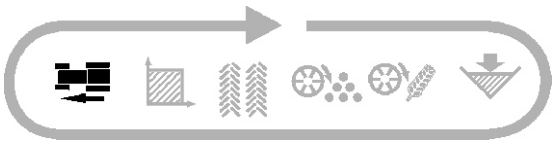
OR

HOLD STOP Ha→0 to reset currently displayed Area Total

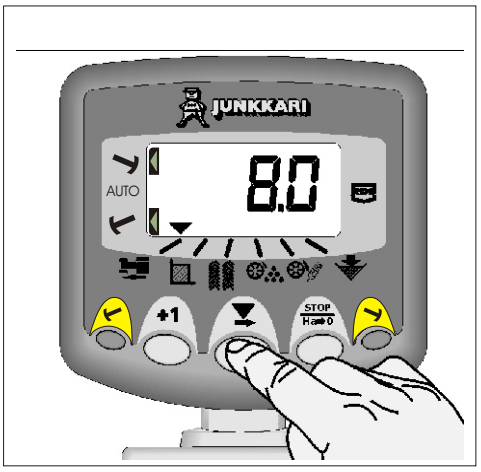
CH	Function	Units
1	Forward speed	km/h
2	Area Total 1 or 2	ha
3	Tramline / Current bout	-
4	Fertilizer shaft speed	rpm
5	Seed shaft speed	rpm
6	Hopper level alarm	**"alar"**

6.1 FORWARD SPEED / SENSOR CALIBRATION

1 SELECT FORWARD SPEED

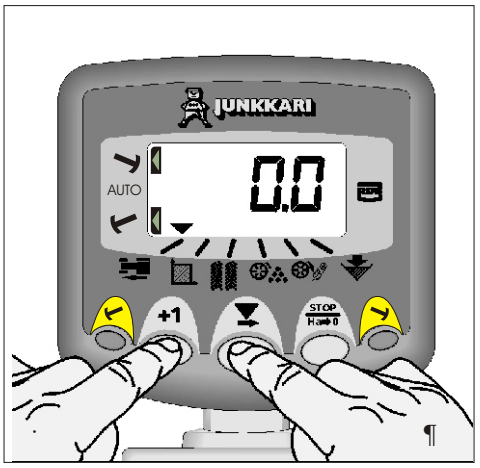


If the forward speed goes less than 2 km/h, then the instrument will bleep twice and the display alternates between the selected channel and the forward speed channel.



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 theeoretical 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

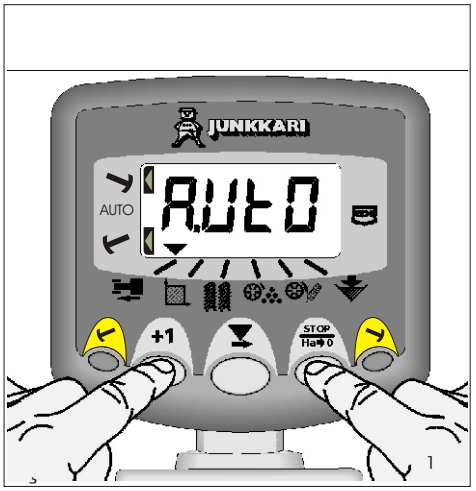
¹ **HOLD** to change the digit or move the decimal point.

2.100, **2.200**, **2.300**, **2.400**, etc

º **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



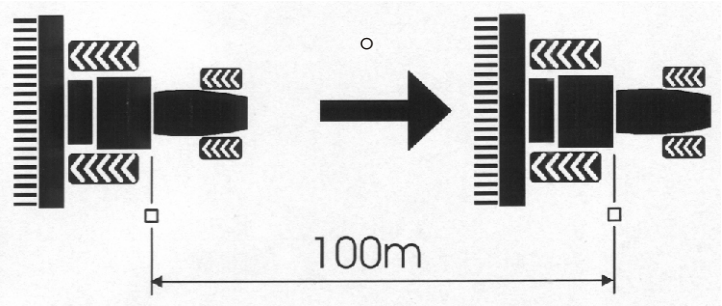
Auto-calibrate in field conditions for maximum accuracy.

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

· Select the channel.

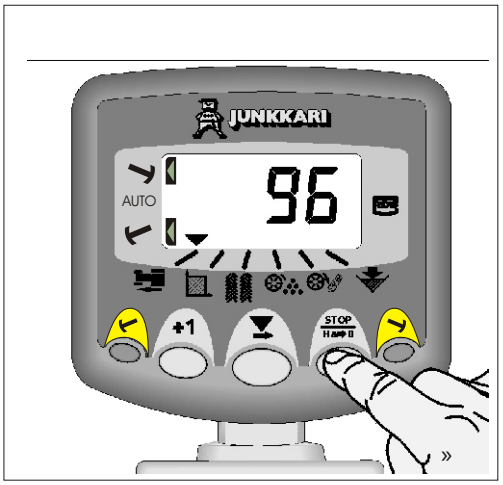
¸ HOLD **+1** CONTINUOUSLY.
The instrument enters programming mode after three (3) seconds.

¹ PRESS STOP Ha 0 .
Auto calibration will then begin.



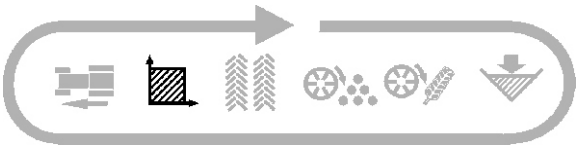
º Drive up to the second marker.
The instrument displays the total number of sensor pulses received over the distance.

» PRESS STOP Ha 0 .
Speed calibration is now complete.
The calibration factor is automatically calculated and stored in the memory.



6.2 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.

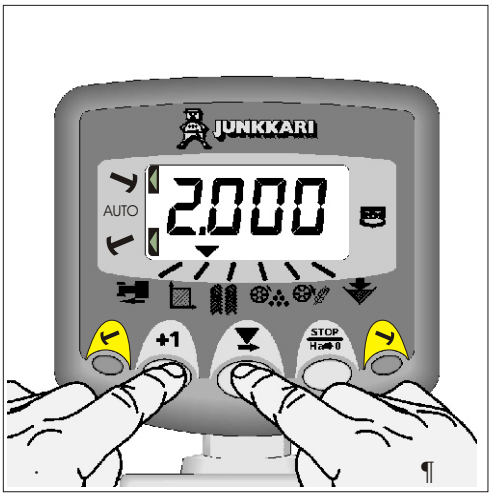
3. RESET AREA REGISTER

Select the TOT1 or TOT2 and release.
HOLD STOP Ha→0 for 5 seconds.

The total then resets to zero.

4. PROGRAMMING THE WORKING WIDTH

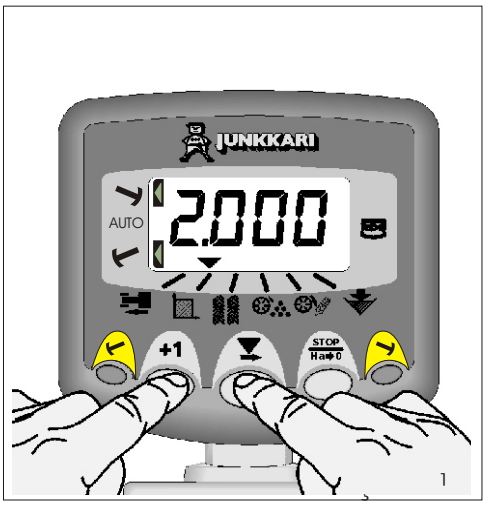
The working width of the machine in metres.



¶ Select the channel.

· HOLD **+1** CONTINUOUSLY
The instrument enters the programming mode after 3 seconds.

¸ PRESS to select the digit or decimal point.
.



2.000, **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**

º RELEASE to select the next digit.

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

6.3 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.

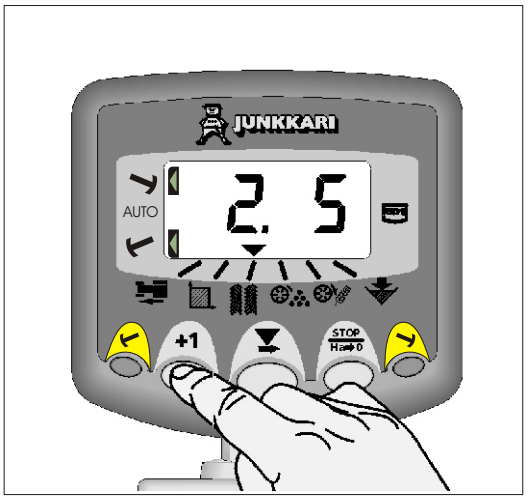
The display defaults to the channel after 10 seconds (unless the AREA TOTAL was selected).

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 **STOP Ha➡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.

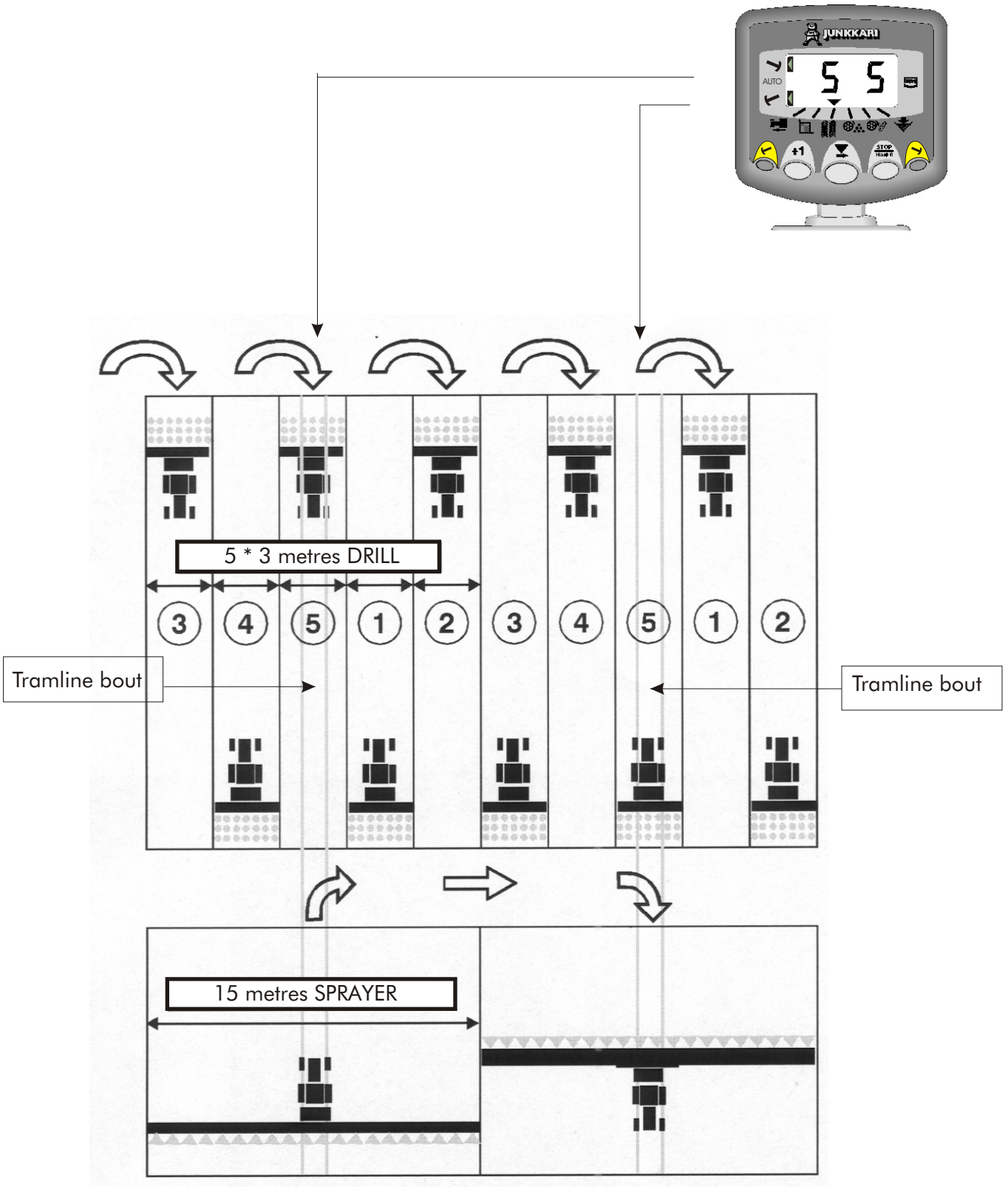
The display will flash "STOP".

PRESS **STOP Ha➡0** again to resume the normal bout sequence.

6.3.1 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.

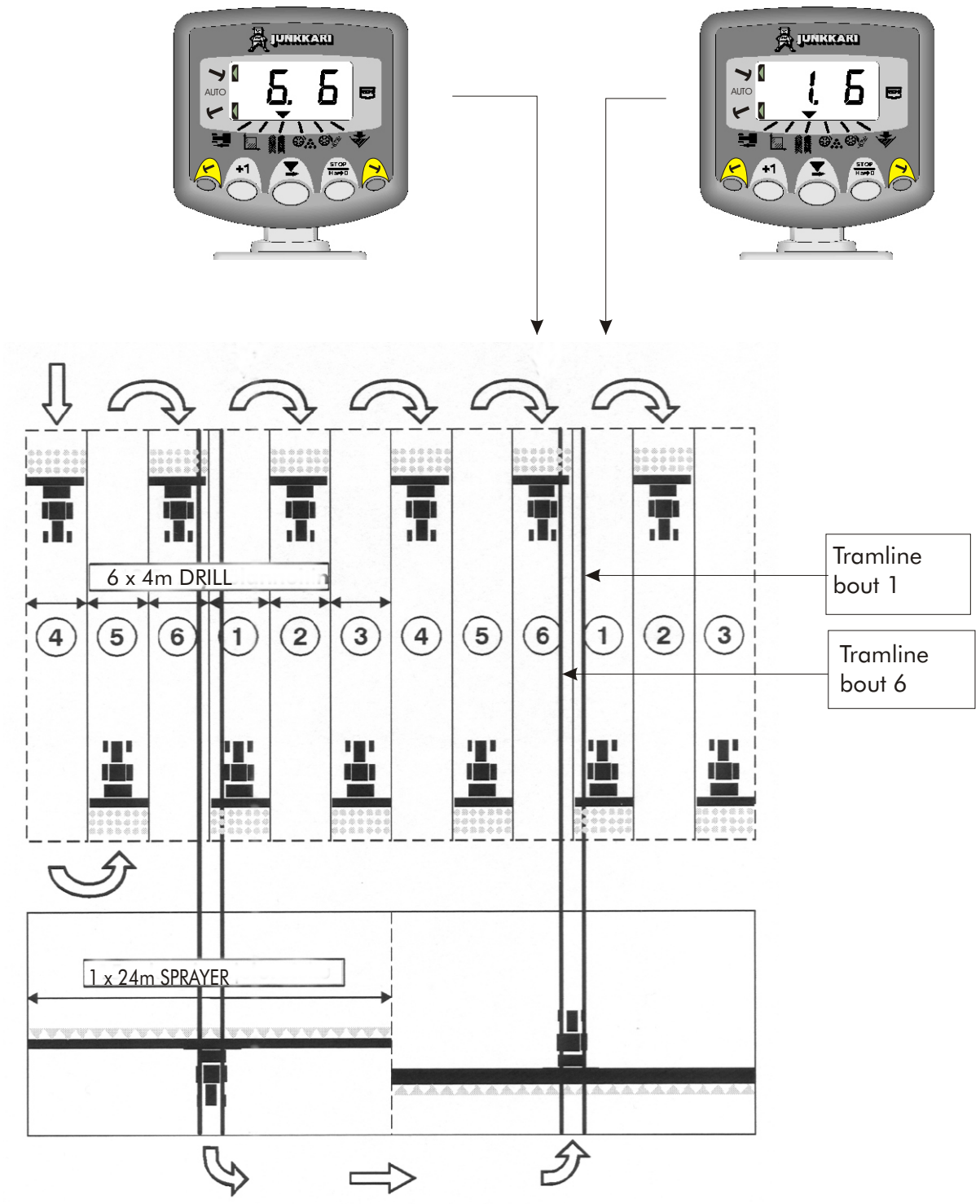
The instrument will beep once at the beginning of the tramline bout, and the display will continue flashing for the duration of the bout.



6.3.2 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.

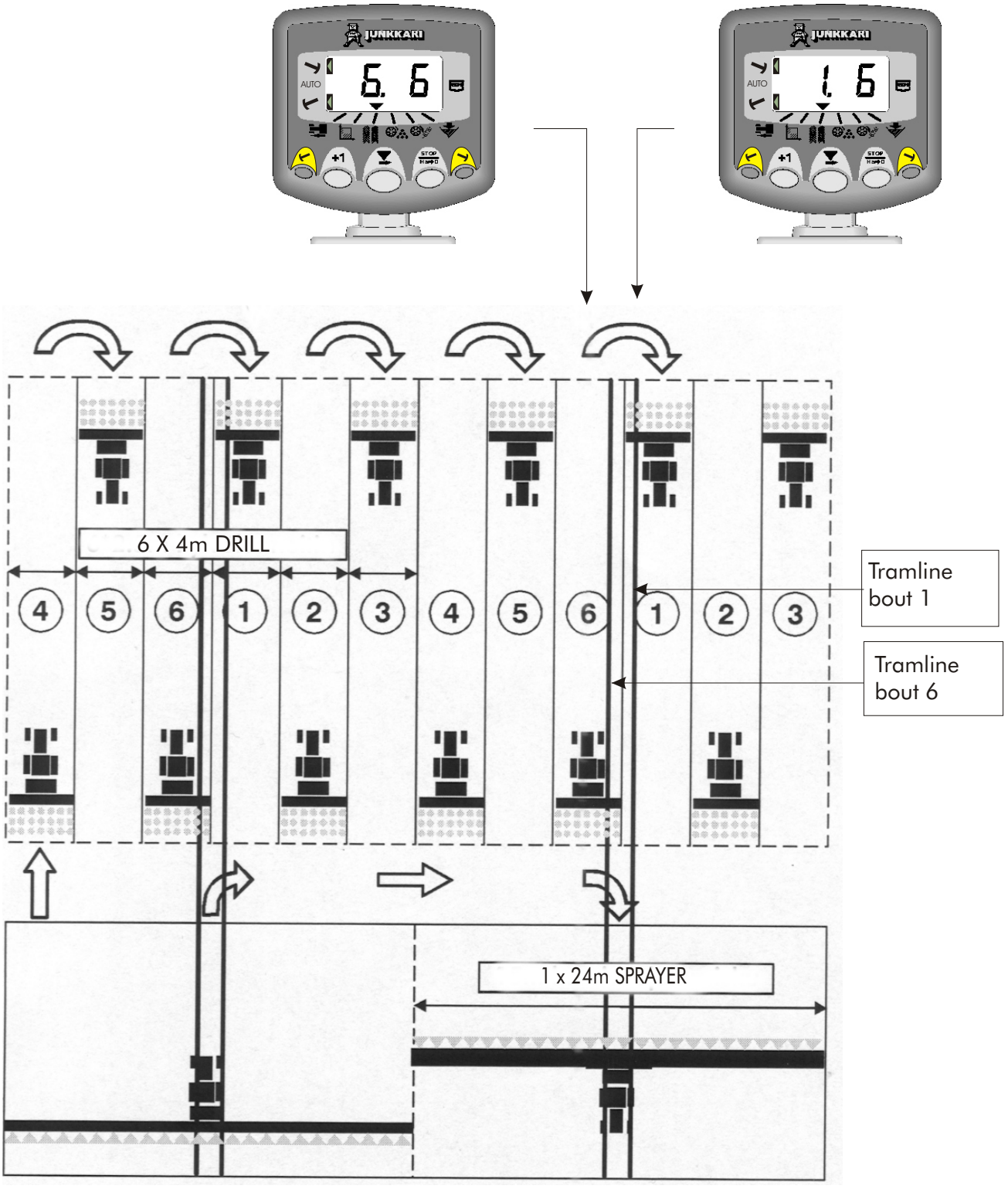
The instrument will beep once at the beginning of each tramline bout, and the display will continue flashing for the duration of the bout.



6.3.3 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.



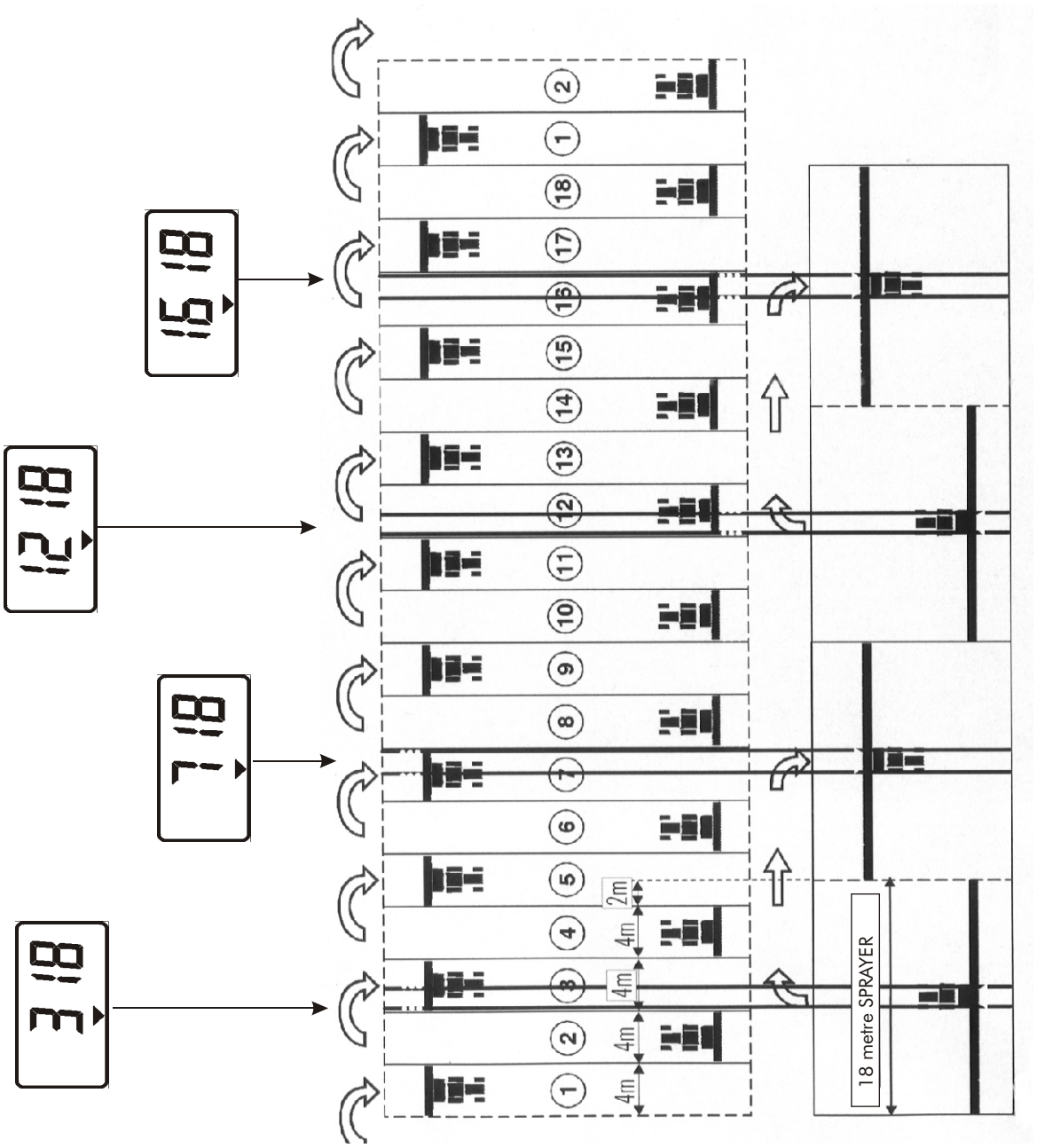
6.3.4 18 METRE TRAMLINING

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.

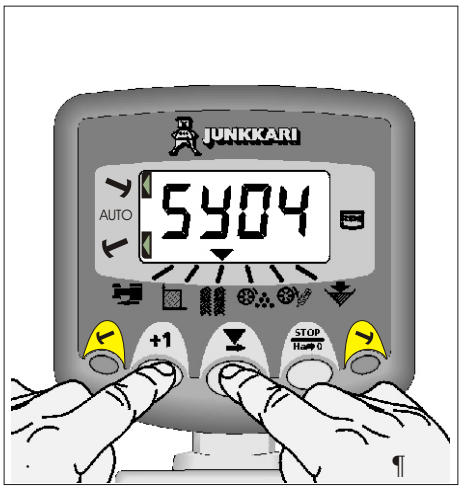


6.3.5 PROGRAMMING OF THE TRAMLINE BOUT

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.

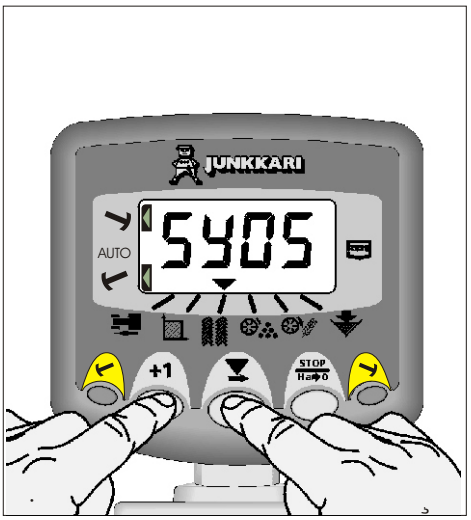
To switch off the tramlining function, select "OFF" from the bout cycle.



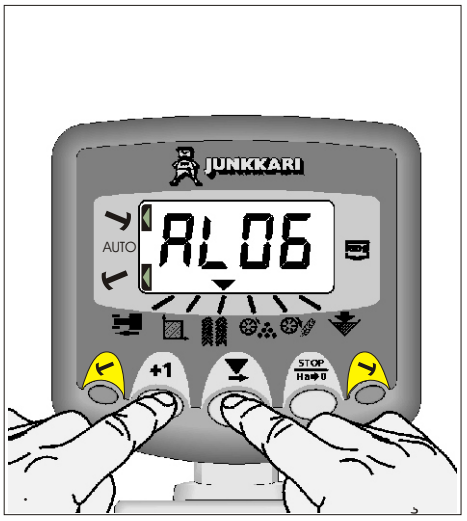
¶ Select the ||| channel.

· HOLD **+1** CONTINUOUSLY.
The instrument enters program mode after 3 seconds.

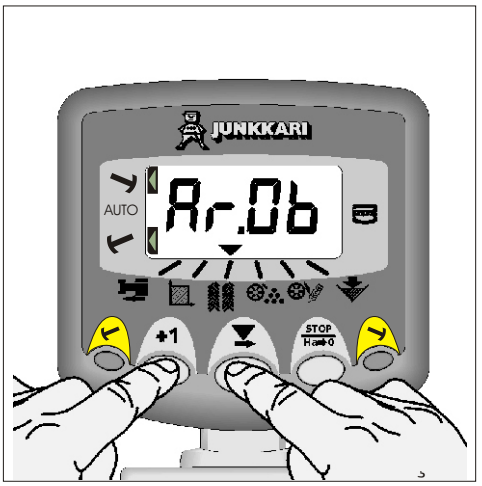
¸ PRESS ▼ and the tramline bout cycles ...Sy05, Sy06, SY07...SY15 for symmetrical tramlining.



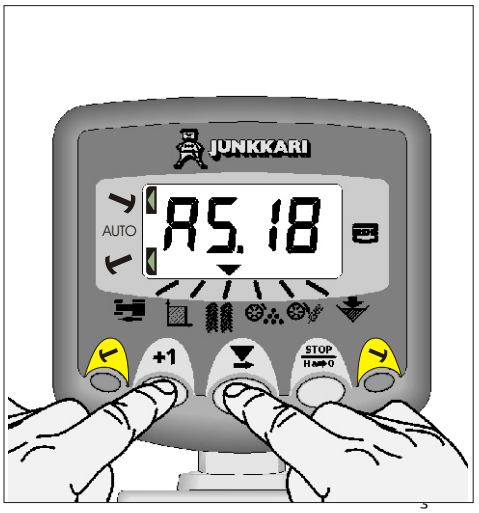
... Then AL.01,AL.02...AL.15 for asymmetric **left** tramlining.



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

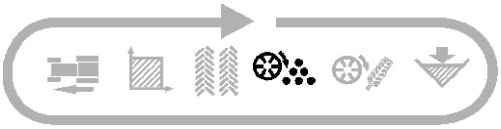


... Then 18 for the 18 metre tramlining mode.



6.4 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 STOP Ha0 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

¹ HOLD to change digit or move the decimal point.

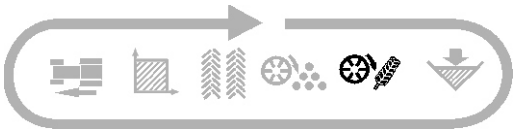
2.100, **2.200**, **2.300**, **2.400**, etc

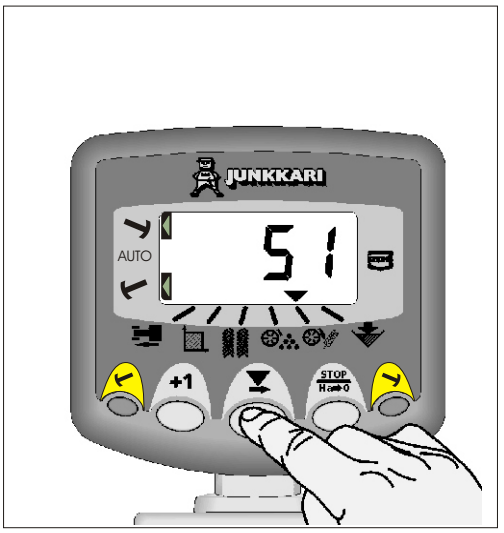
º RELEASE to select next digit.

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

6.5 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 STOP Ha→0 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.

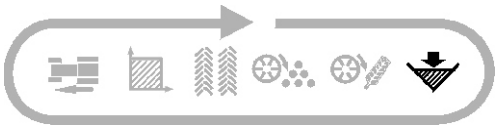
2. SETTING THE LOW SPEED ALARM

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.

6.6 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 beep5 times and will default to the channel from the current channel selected.

2. ENABLE / DISABLE HOPPER LEVEL ALARM

¶ Select the channel.

· PRESS and HOLD **+1** CONTINUOUSLY.

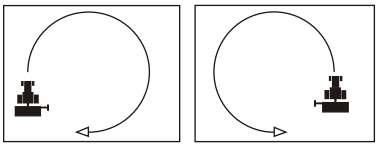
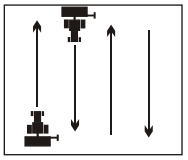
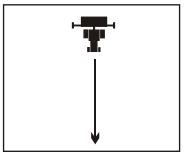
¸ PRESS to select 0 or 1.

0 = Alarm disabled
1 = Alarm enabled

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

6.7 ROW MARKING

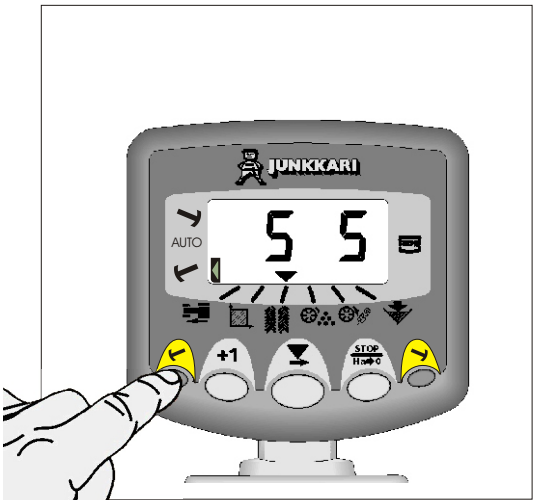
The row marker is on when the Wizard is switched on, and it is in the manual row marking-mode.

In the manual row marking-mode only one 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 .

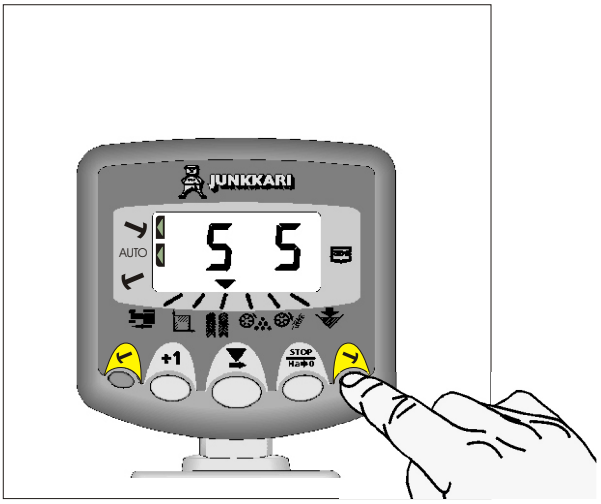
The manual row marking is switched on by pressing either right or left row marker button.
If the row marking is done continuously to the right side of the machine, press the right marker button, and if it is done to the left, press the left marker button.
The function is turned off by pressing the same 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.

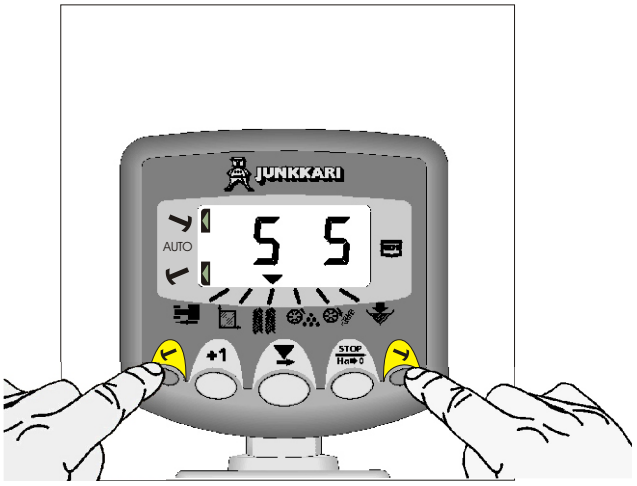
The automatic row marking mode is switched on by pressing continuously either right or left side row marker button, depending on which side of the drill the row marking is required to start from.
The function is turned off by pressing the same button continuously again.



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 **STOP Ha➡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".

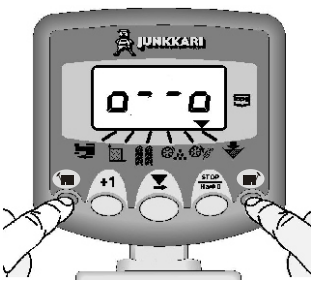
PRESS **STOP Ha➡0** again to resume the normal bout sequence.

5. HOW TO TURN ROW MARKERS ON / OFF

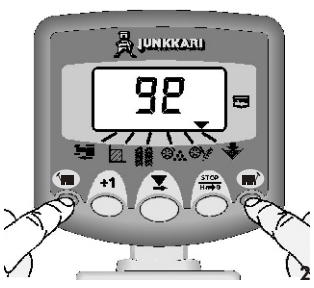
HOLD and CONTINUOUSLY to turn on or off the row markers.

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

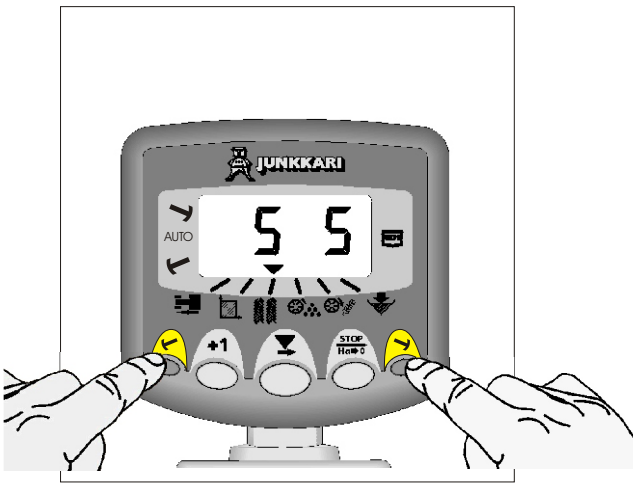
The display, see illustrations below.



ON



OFF

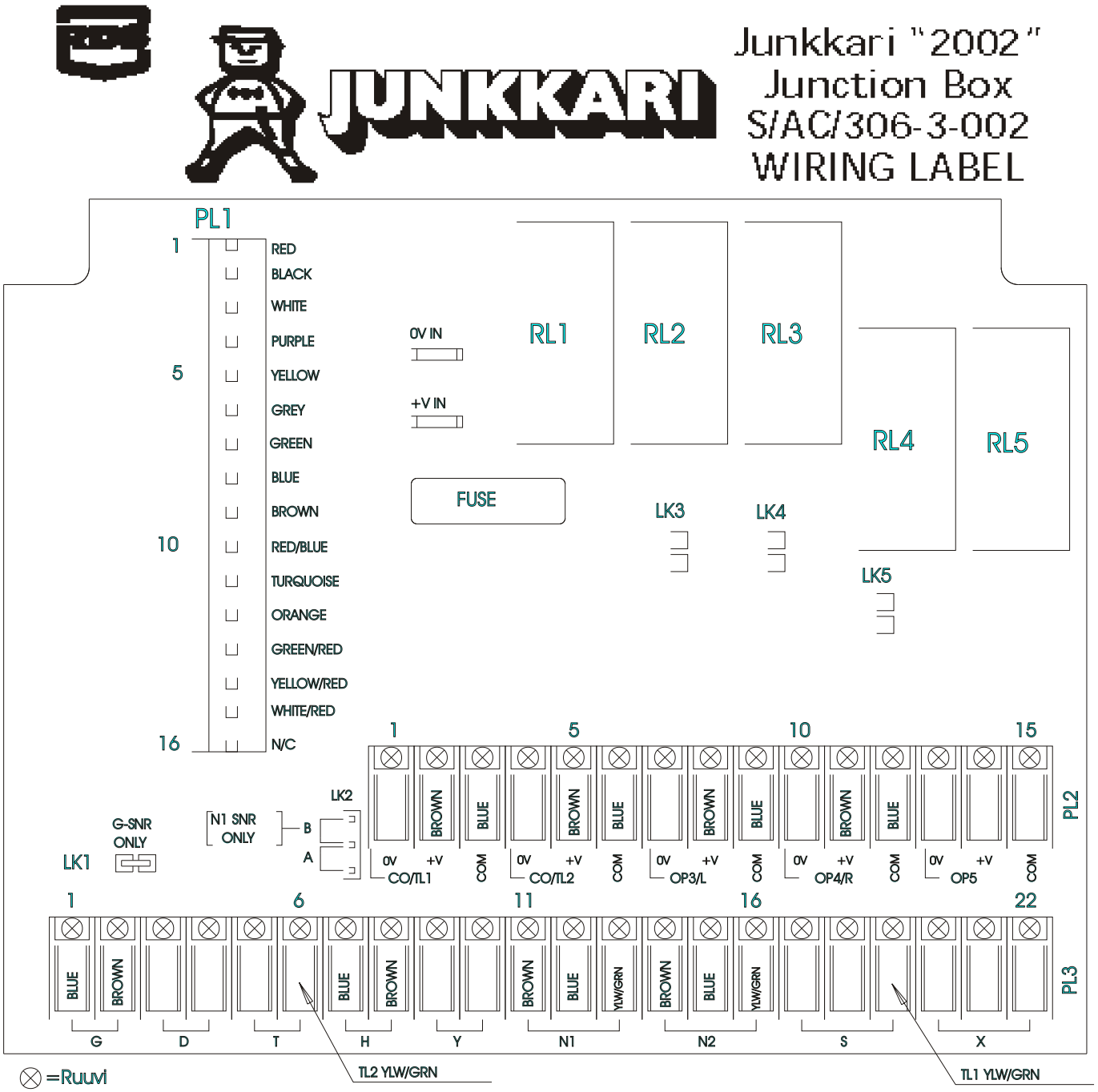


7. TROUBLESHOOTING CHART

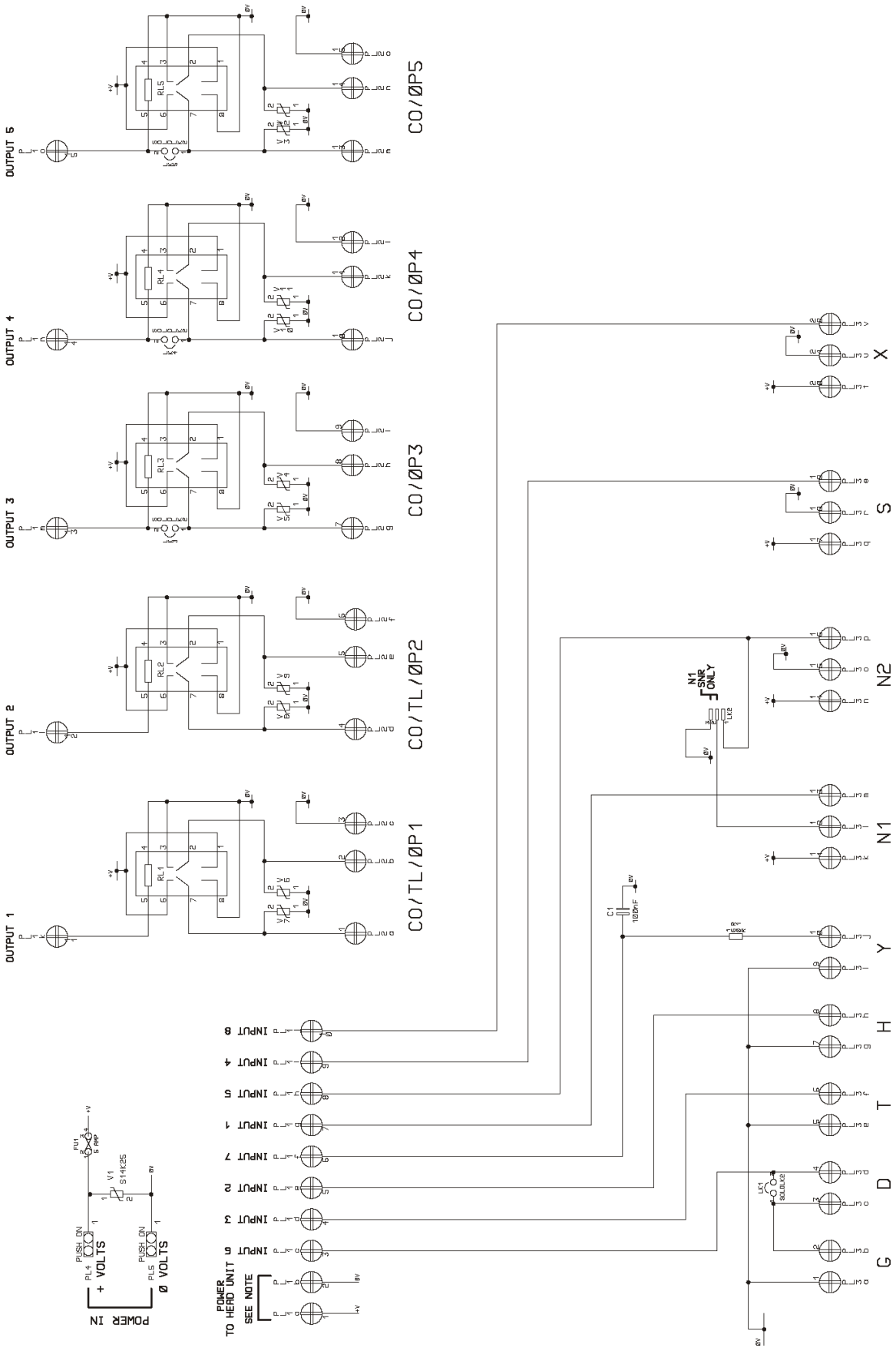
FAULT	CAUSE	REMEDY
The display does not turn on.	The voltage is less than 8 Volts.	Take care that there is enough power reserve, for example, charge the battery in time.
"BATT" on the display.	The voltage is less than 10 Volts. There is just enough power to show this announcement.	Check the condition 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.
"TL 1" flashes on the display.	There is, for example, dirt on the seed shaft combination switches that causes the malfunction. The cable is broken.	Turn the calibration lever half (1/2) round clockwise, check the switch and if needed, replace the switch. Replace or repair the cable.
"TL 1" flashes on the display.	There is, for example, dirt on the fert. shaft combination switches that causes the malfunction. The cable is broken.	Turn the calibration lever half (1/2) round clockwise, check the switch and if needed, replace the switch. Replace or repair the cable.
The display does not show the forward speed	The magnet has fallen off. The sensor bracket is loose. The sensor cable is broken. The distance between the magnet and the sensor is too wide.	Fix the magnet or the bracket again. Replace or repair the cable. Make sure that the magnet is fixed and adjust the distance to be adequate.
The tramlining bout value is not stable.	Refer to last paragraph to find out the cause.	Refer to last paragraph to find out the remedy.
The tramlining bout value does not show on the display or it is not counting.	The tramlining function is OFF. The tramlining has been stopped.	Switch the tramlining on to appropriate mode. Press STOP / Ha➡0 to continue tramlining.
The AREA TOTAL is not counting.	See paragraph "The display does not show the forward speed".	Refer to paragraph "The display does not show the forward speed" for remedy.
Incorrect display on FORWARD SPEED and AREA TOTAL.	The sensor calibration is not done properly.	Re-calibrate FORWARD SPEED and AREA TOTAL according to the instructions.
The hopper level alarm does not alarm even when the hopper is totally empty.	The hopper level alarm is switched off. The cable is broken.	Switch the alarm on. Replace or repair the cable.
The hopper level alarm alarms continuously.	Either the seed or fertilizer level has dropped below the sensors.	Switch the hopper level alarm off when performing the small seed sowing.

FAULT	CAUSE	REMEDY
The row markers don't work.	The restrictor valve is closed.	Open the restrictor valve and adjust the flow according to the instructions.
	The row marking function is switched off.	Switch on row markers from the Wizard.
	The cable is broken.	Replace or repair cable.
	The transportation linchpin is still attached to the marker.	Detach the transportation linchpin from the row marker turning unit.
	The row marking has been stopped.	Press STOP Ha➡0 to continue row marking.
The row marker is too slow.	The restrictor valve is adjusted to too small flow.	Re-adjust the flow from the restrictor valve according to the instructions.
	There is air in the hydraulic system.	Check the tractor hydraulics and perform required reparations
	There is too little oil in the tractor hydraulic system.	
The row marker is too fast.	The restrictor valve is adjusted to too big flow.	Re-adjust the flow from the restrictor valve according to the instructions.

8. CIRCUIT BOARD

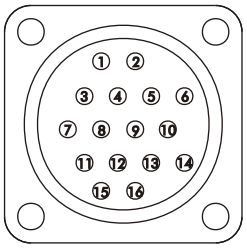


9. WIRING DIAGRAM

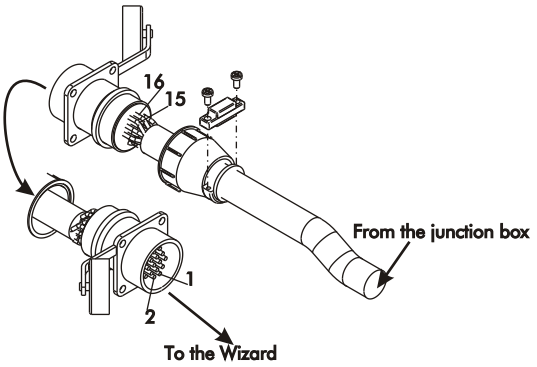


10. ELECTRICAL CONNECTORS

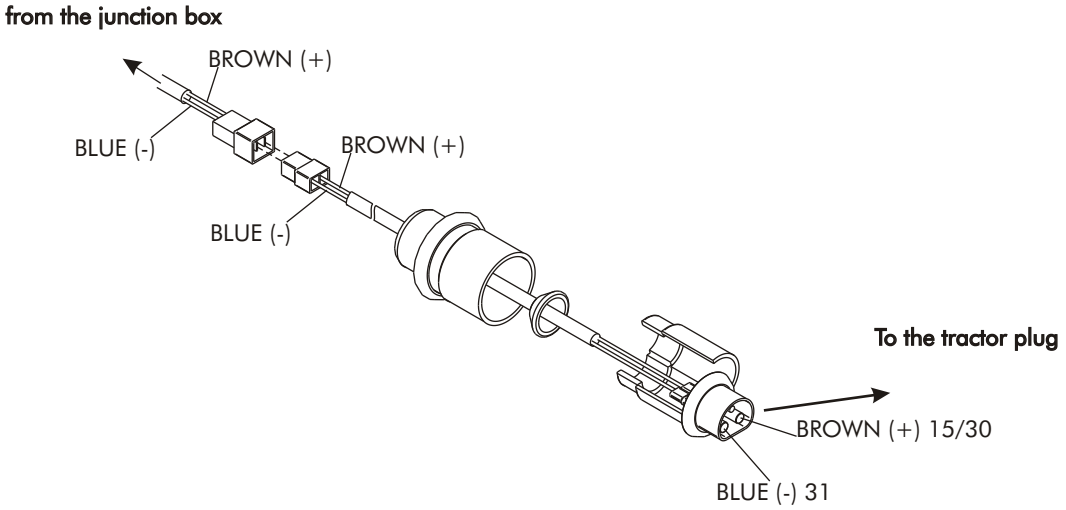
16-PIN DATA TRANSFER CABLE CONNECTORS



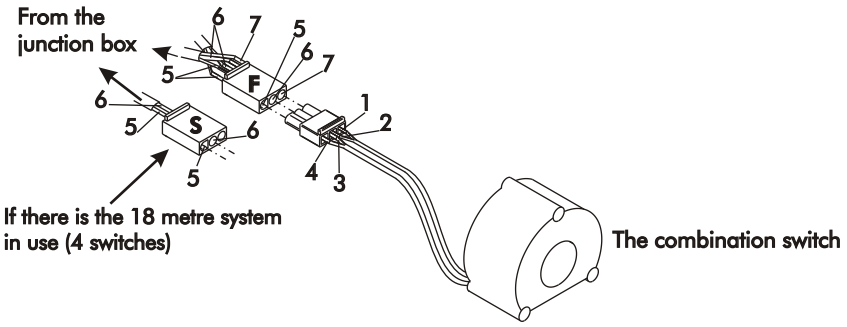
NR	CABLE COLOR
1	RED
2	RED-BROWN
3	YELLOW-RED
4	GREEN
5	VIOLET
6	BROWN
7	WHITE
8	YELLOW
9	TURQUISE
10	PINK
11	BLACK
12	GREY
13	GREEN-RED
14	BLUE
15	ORANGE
16	RED-BLUE



3-PIN CONNECTOR

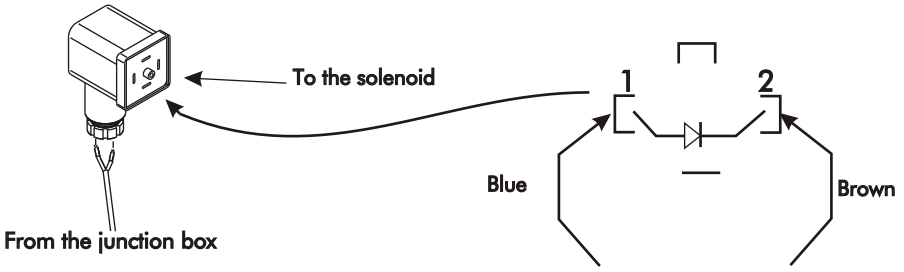


TRAMLINE MARKER CONNECTORS



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



PERSONAL NOTES :