trailed seed drills

NEUMASEM 901

INSTRUCTIONS MANUAL
MAINTENANCE
DOSAGE

read the manual before working with the machine

SOLÀ seed drills and fertilizer spreaders are manufactured in a factory specialized in this area. They are guaranteed by thousands of users esperience.

They are high technology machines, planned for a long service, without breakdowns, in very different conditions and with a simple and efficient mechanism designed to do an excellent work with minimun maintenance.

With this information about characteristics, possibilities and adjustments, we wish to help you to obtain all that you expect from our machine.

ISO 9001
BUREAU VERITAS
Certification

Certified Quality Sistem

Ref.: CN-811018
4nd edition - 02- 2009

TABLE OF CONTENTS

1. INTRODUCTION

Before any use of the machine it is very important to read the instructions and suggestions in this booklet, in order to reduce the danger of accidents and to prevent damages to the seed-drill due to incorrect use or defective maintenance. Doing so, you will increase its performance and useful life.

This booklet must be read by any operator of the machine, during its operation, repairs, maintenance and transport. It is an integrating part of the product, and must be kept in a safe place for consultation during the whole life span of the machine.

SOLÀ will not asume any responsability for damages or breakdowns caused by non-observance of the instructions given in this booklet.

In the first chapters you will find the Technical Data and Safety Instructions, also some Essential Sowing Concepts. In the Rules of Use and Maintenance chapters are the basic knowledges for using the machine. The booklet is completed with a seed dosage table.

SOLÀ reserves the right to modify drawings and technical data given in this manual if this can help to improve the seed-drill quality.

2. TECHNICAL DATA NEUMASEM 901

2.1 NEUMASEM-901

working width	**transport** width	**empty** weight	**hopper** capacity	**arms** number	**separation** between arms	**minimum** power	**necessary** flow	**wheel tyres**
6 m	3 m	5300 kg	5000 l	48	12,5 cm	160 CV	43 l/min	550-60-22,5 16 PR
8 m	3 m	5600 kg	5000 l	64	12,5 cm	180 CV	43 l/min	550-60-22,5 16 PR

2.2 STANDARD EQUIPMENT

- Electrovalves operated hydraulic installation
- Hopper seed sieve
- Hopper ladder
- Land cultivator, adjustable in working depth
- Adjustable leveller
- Adjustable sowing depth
- Spring harrow
- Lateral wheels for the control of working depth
- Hydraulic disc tracers
- Frontal adjustable support.
- Hopper cover
- Set of lights: signposting, sidelights, brake-lights, warning lights and working headlamp.
- Service drum brakes
- Parking wedge brakes
- Hectare counter
- Turbine fan revolutions counter
- Hopper seed level sensor
- Total cut of sowing
- Official traffic homologation

3. SAFETY INSTRUCTIONS

3.1 DANGER SIGNS

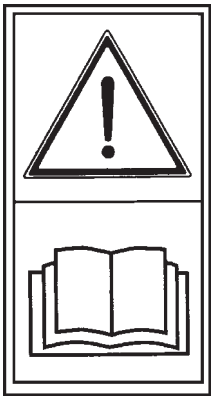
In this booklet you will find three kind of safety and danger signs:

To make easier the machine operation.

To avoid damages to the machine or its optional equipment.

To avoid personal injuries.

However, the following warnings are reproduced on the machine. Keep them clean and replace them if they should come off or become ilegible. Carefully read each description and learn their meanings by heart.



Before operating, carefully read the instruction booklet.

Before carrying out maintenance, stop the machine and consult the instruction booklet.

Danger of crushing when working under the machine. Secure it to avoid accidental falling.

Danger of getting squashed during closure. Keep at a safe distance from the machine.

Don’t stay under the sowing equipment or in its range.

Possibility of penetration by hydraulic fluid. Keep in good condition the hydraulic hosepipes.

Danger of falling. Don’t ride on the machine or its optional equipment.

Handling point for lifting

Don’t stay under the disk tracers or in its range.

3.2 ADEQUATE USE

- The **NEUMASEM-901** seeder has been manufacturated for agriculture works, specially for cereal and other grain sowing.

- If as a consequence of misuse or bad maintenance the machine suffers damages, the manufacturer will decline any responsability.

- Respect always legal dispositions on machine-security, traffic, health and work-safety.

- Modifications having been carried without written authorization of the manufacturer will result in guarantee-nulity.

3.3 SAFETY REGULATIONS AND ACCIDENT PREVENTION

- Before starting any use of the machine, check safety conditions concerning both work and traffic. Check also visibility around the machine: the working zone must be cleared.

- Respect traffic signs when in public thoroughfare.

- It is strictly forbidden to ride on the machine during working and transport.

- Before starting, familiarize with all activation elements, as well as with general operation.

- Pay special attention to coupling and uncoupling operations.

- Never leave the driver seat during machine operation.

- Do not place strange elements into the hopper.

- When the seed-drill is lifted, the front axle of the tractor discharges. Make sure that the tractor has enough counterwheigt to avoid overturn danger. Check in such situation steering and braking capabilities.

- Before working in the hydraulic installation eliminate the circuit pressure and stop the tractor engine.

- The tubes and hosepipes of the hydraulic circuits suffer, in normal conditions, a natural ageing. The useful life of these elements must not exceed six years. Observe, periodically, if they are in good conditions and replace them at the end of its useful life.

- While parking the machine, don't forget to place the shoe-brakes under the wheels to avoid displacements.

- Before starting a displacement with the sowing equipment folded, we have to secure that the fixing clamps have correctly worked.

- During transport operations, with the seed-drill lifted, block de lowering control. Before getting out the tractor, leave the machine on the floor and take out the starting key.

- During maintenance works, with the seed-drill lifted, always use enough support elements in order to avoid its accidental descent.

3.4 HANDLING

For loading and unloading the machine it is necessary a loading bay or a ramp. It is also necessary coupling the machine to the tractor (see section 5.1 in this booklet).

4. SOWING ESSENTIAL CONCEPTS

4.1 SOIL

The better the soil coindition is, the best quality of sowing. Over big patch or variable furrows it is not possible to do a good work. Althoug NARDI machines are able to take hard efforts in extreme conditions, sowing won't be of good quality if the sown land hasn't adequate conditions.

4.2 SEED

Always use quality and clean seed. When sowing barley, use trimmed one.

4.3 DEPTH

The suggested sowing depth is from 3 to 5 cm. To deepen more is an error, as the rizome could not get the surface, resulting in the plant's death. It doesn't matter if some grains are visible: the spring harrow will cover them.

Sowing depth has influence in the birth and vigour of the plant and consequently in its resistance to both frost and drought. The sprouting node will be always between 1 or 2 cm under the surface, independently of the sowing depth.

Deeper sowing doesn't mean deeper roots. Only a few roots arise from the bottom of the seed. The main root mass is born from the sprouting node, just under the ground level.

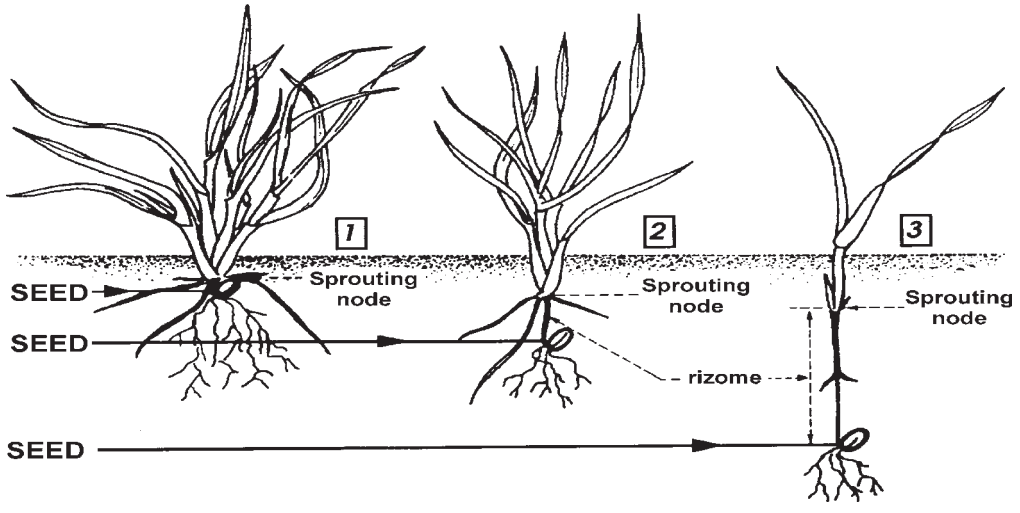


fig. 1

1

Depth sow: 2 to 4 cm

Thick stem, short rhizome, good freezing endurance.

Multiple sprouting, 3 to 6 shoots and a lot of blades (6 to 10).

Big tuft of roots, 5 cm wide and 10 to 12 cm deep.

With less grains per square meter, we obtain more ears.

2

Depth sow: 5 to 6 cm

Thin stem, rizhome exposed to freezing.

Delayed and poor sprouting, one shoot (sometimes none), not many blades (3 to 4).

Medium tuft of roots, 3 cm wide and 5 cm deep.

We need more grains per square meter to obtain the same quantity of ears as in the first case.

3

Depth sow: 8 to 10 cm

Very thin stem. No sprouting and a single blade.

The grain reserves become depleted by forming a large rizhome that can be easily cutted off by ice.

Poor tuft of roots, just 1 cm wide and 3 cm deep.

We need twice the grains per square meter to obtain the same quantity of ears as in the first case.

In very cold areas, successive frosts may cause soil surface fluffing up, involving the risk of releasing the incipient plant roots and causing its death. To avoid this danger, it is recommendable to deepen more the seed or to pass a roller in order to compact the land after sowing.

Work always at a regular speed. Hard brakes and sudden accelerations result in irregular seed distribution.

5. RULES OF USE

5.1 COUPLING AND CONNECTIONS

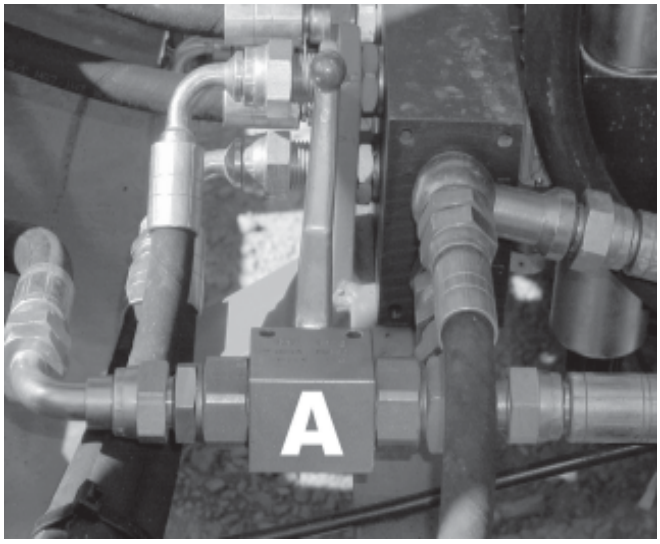
The seed drill Neumasem-901 is supplied with a ring coupling device (fig.2).

fig. 2

Once the machine is coupled, connect the hydraulic system, the service brake, the control monitors, the side- and winking lights and the working floodlight.

fig. 3

For the good operation of the electrovalves, it is very important to assembly appropiately the feed circuit. If your tractor has a «closed circuit», you must close the flow control valve (A, fig. 3). If your tractor has an «open circuit», you must open it.



When under pressure, oil can penetrate the skin and cause serious injuries. Keep the pipes in good condition.

5.2 WORKING AND TRANSPORT POSITION

To make easier its transport, the Neumasem 901 has its wheels assembled inside out, so the width reduces to 2,4 m. Obviously, before starting any operation, the wheels have to be placed in the correct position. In figure n. 4 a wheel is showed in transport position.

To do this, couple the machine to the tractor and, over a hard ground, lower the sowing equipment so that the wheels loss contact with the floor. Remove the wheels of its transport position and assembly them in its working position (width 3 m).

fig. 4

Secure the machine to avoid its accidental descent while changing the wheels position.

5.3 HYDRAULIC SYSTEM

Flow control valves

Two flow control valves (fig. 5) are supplied with the seed drill in order to smooth the hydraulic folding and unfolding of the machine. The valves have to be adjusted depending on the hydraulic flow supplied by the tractor. It is advisable to start with the valve almost closed to avoid a fast folding that could cause damages to the seed drill.

fig. 5

Never stand under the folding sowing train range.

Pilot operated check valve

In order to avoid accidental operation of the hydraulic system during the circulation by public thoroughfare, a pilot operated check valve is supplied. **Before disconnecting the hydraulic pipes from the tractor, it is necessary to unpressurize them to avoid the unfolding of the sowing equipment.** This operation must be done whith the tractor stopped.

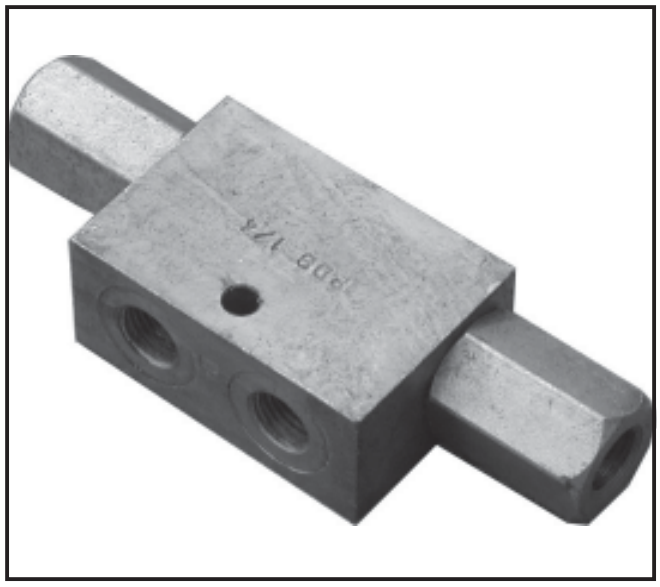


fig. 6

Two hydraulic safety clamps (fig. 7) are fitted to avoid the sowing equipment descent during the seed drill transport. The clamps couple and uncouple automatically each time the sowing equipment is folded or unfolded.

fig. 7

Before lowering the sowing equipment for working and after giving pressure to the system, make sure that the safety clamps are released.

Parachute valves

The parachute valves are directly assembled on the cylinder connections of the sowing equipment. The valves mission is to avoid, in the case of tubes rupture, the uncontrolled descent of the equipment. The valves are adjusted in the factory so you must avoid any manipulation during repairs and/or maintenance work. For your own security, verify that the valves are in its place before coupling the machine to the tractor and starting to work.

When under pressure, oil can penetrate the skin and cause serious injuries. Keep the pipes in good condition.

5.4 DOSAGE

There are two dosage ways: for normal seed and for little seed with minimum flow.

Normal seed

Place the red closing device of the dispenser (fig. 8, nº 3) and the bracket of the adjustment wing (fig. 8, nº 8) in the position N.

When changing the position of both the bracket of the adjustment wing and the red closing device, it is essential that the dispenser may turn and the hopper to be empty.

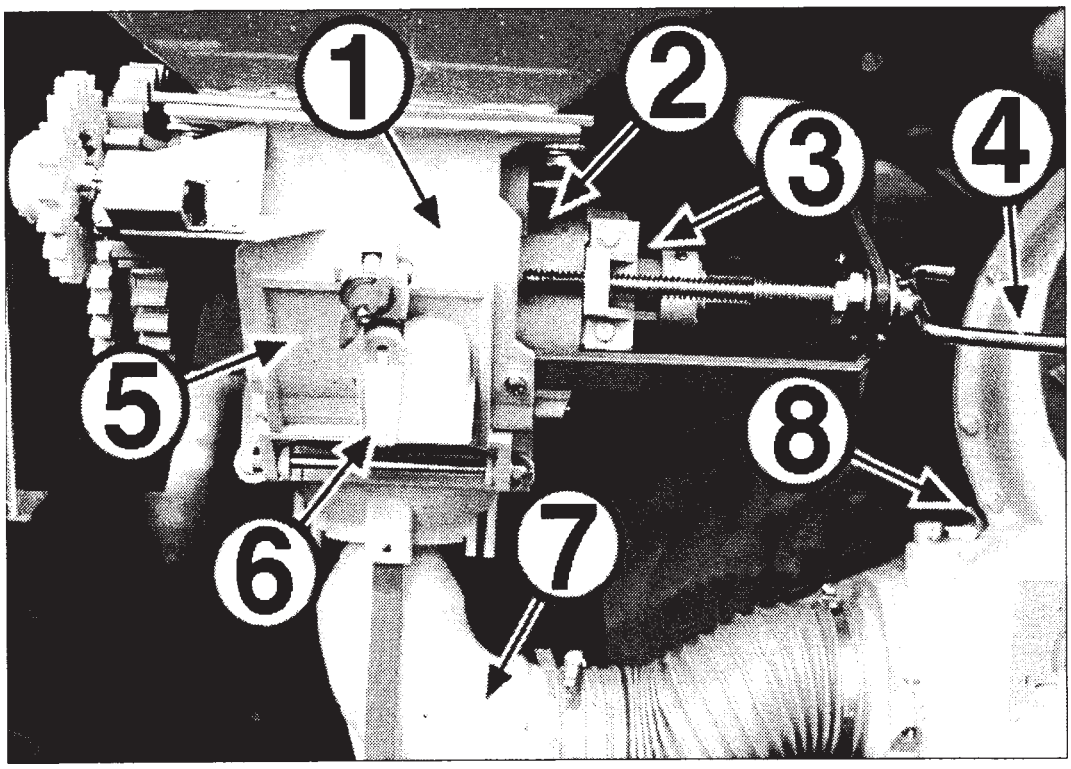


fig. 8

1 Casing
2 Dosage scale
3 Red closing device
N = normal seed
F = small seed
4 Dosage spindle
5 Emptying trapdoor
6 Revolving valve (not in all the machines)
7 Collector
8 Elastic bracket of the adjustment wing
N = normal seed
F = small seed

Small seed

Turn the dosage spindle until the dosage scale indicates «0». Then turn the red closing device (fig. 8, nº 3) counterclockwise until it rests inserted in the slot of the hexagonal shaft. The «F» in the red closing device must be visible. Now, we can adjust the dosage spindle from 0 to 25 in the dosage scale. The bracket of the adjustment wing of the drive fan (fig. 8, nº 8) must be in «F» position.

Flow test

To do the **flow test,** close the emptying trapdoor and fill the hopper with some seed. Dismantle the collector under the venturi, releasing the butterfly bolt (fig. 8, nº 7). Place a bag under the exit of the venturi injector that we have dismantled. Place the crank in the transmission wheel (little) and turn against the clockwise the following number of turns:

Neumasem-901-800/64	25 turns
Neumasem-901-600/48	33,5 turns

The hectare-counter must indicate 250 m^2.

Weigh the seed in the bag. The flow in kg/ha will be the collected weight multiplyied by 80.

Repeat the calibration operation as many times as necessary till the obtention of the desired flow.

Assemble the venturi injector and fasten it with the butterfly bolt.

To do the flow test is essential to stop and lower the machine. The tractor and the power shaft must be disconnected.

Field test

If it seems that there are significant diferences between the dose test and the actual dispensed dose -due to, by sample, an irregular or soft terrain- a field test can be performed to determine the real number of wheel turns for the dose test.

First, with a measuring tape, signpost the test distance (in meters) in the plot of land that is to be sowed.

Neumasem-901-800/64	31,25 m
Neumasem-901-600/48	41,67 m

Second, with the seed-drill in working position, cover that distance. Count the wheel turns needed for completing the path. Put a mark on the tyre to make this easier.

As a result of carrying out the dose test with this number of turns, we obtain the exact dose delivered by the seed-drill.

Seed dosage adjust

With current use of high quality certificated seed, it's not enough to set the weight that has to be distributed by the seed-drill, since the success of the harvest depends on the number of plants that reach complete ripeness.

Each plant requires its living space from which feeds on. In this way, as poor could be an high plant density as a low. To decide the adequate dose, we must know the number of plants per square meter we are going to sow.

Orientatively, the plant number recommended for wheat and barley in dry land is as follows:

AUTUMN:	Early sowing	200 plants per m^2
	Late sowing	265 plants per m^2
SPRING:	Early sowing	310 plants per m^2
	Late sowing	445 plants per m^2

Notice that, in spring, sprouting is always lower and, consequently, more seed is needed to obtain the same results that in autumn.

Moreover, it must be took into account that the maximum germinative value is variable and depends on a lot of factors. Experimentally, it can be established between 70% and 80%, that's equivalent to multiply by 1,43 and 1,25 respectively the number of grains needed. Next is the practical method to determine the dose (in kg/ha) starting from the number of plants per square meter we want to obtain.

1) Introduce in the seed the «grain counter». A single grain must remain in each hole, totalling 100 grains. Repeat this operation for 10 times in order to obtain a final amount of 1000 grains.

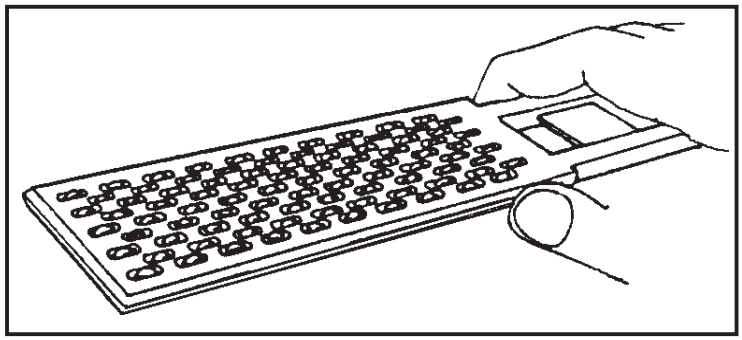


fig. 9

2) Weigh the 1000 grains in the precision scales. The weight in gram is called from now «OPERATIVE WEIGHT».

3) Knowing the grains per square meter we are going to sow, it is easy to obtain the dose in kg/ha that we must adjust in the dosage scale:

kilos per hectare = (grains per m^2 x OPERATIVE WEIGHT) / 100

The seed dose must be adjusted to each soil depending on its texture, fertilization level, dampness and sowing time, grain quality, germinative value, etcetera.

5.5 MICRODOSAGE

The microdosage system is used to better distribute small seed in little amounts. With this system, a double cell width is obtained for the same seed quantity, resulting in a stronger auto-cleaning action.

Pull from the toothed wheel (fig. 10 nº 1) until it fits: the microdosage is activated. Read in the dosage table (page 32) the adequate dose value for small seed with the «M» microdosage system.

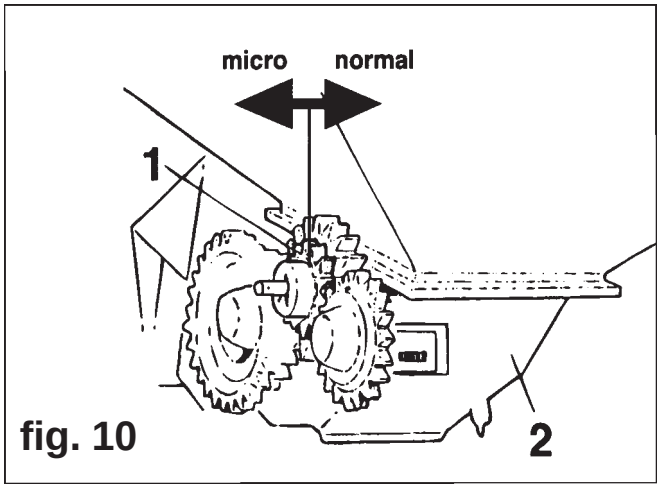


fig. 10

1 Toothed wheel
2 Dispenser

Check the cleaning brush condition before sowing small seed.

5.6 SOWING DEPTH CONTROL

The cultivator-leveler-sowing train set depth is adjusted by means of two hydraulic pistons (A, fig. 11) both fitted with descent mechanical blocks (fig. 12). ***The seed drill must work horizontally, with front and rear coulters penetrating equally the soil.*** For levelling, regulate the central hydraulic piston (B, fig. 11), as it was an adjustable upper link.

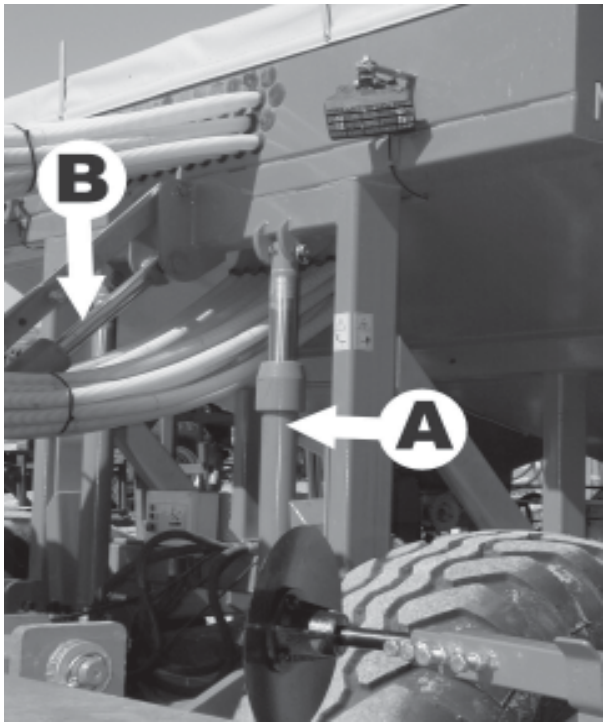


fig. 11

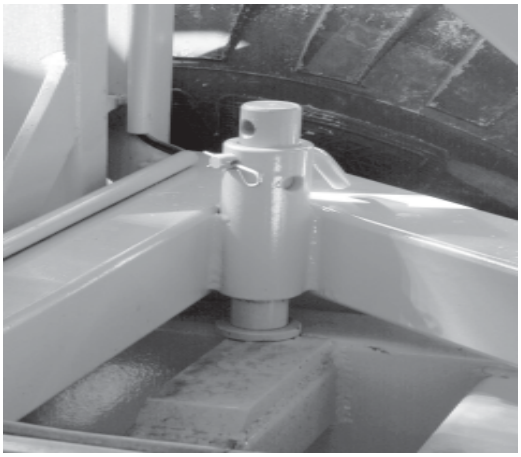


fig. 12

Plough furrow opener seed drill

Once the machine is resting on the wheels, the sowing depth is regulated by means of a manual hydraulic pump (fig. 13). The descent of each section of the sowing train is achieved by alternatively opening the piston valves (fig. 14).

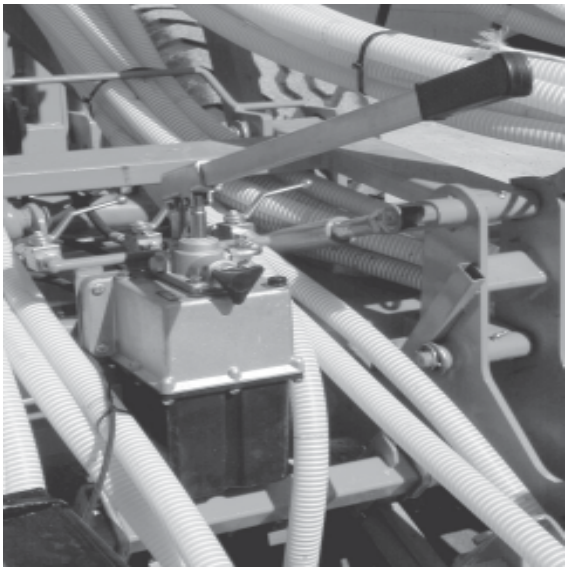


fig. 13

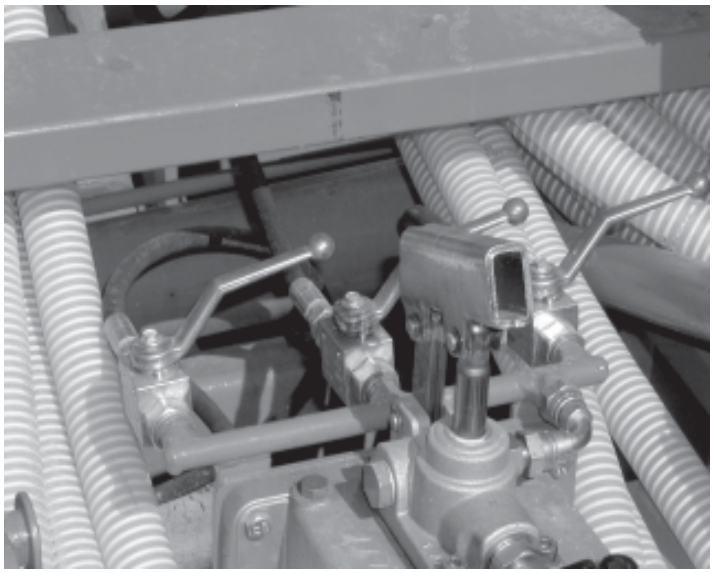


fig. 14

It is also possible to modify the sowing depth by changing the individual pressure of every arm, adjusting the springs strength. Soft springs can be supplied for soft soils.

Finally, we can modify the sowing depth adjusting both the cultivator and the leveler: deepening the cultivator work, the leveler will drag more soil, where the sowing arms will penetrate more profoundly.

Tooth furrow opener seed drill

In the tooth furrow opener machine the profundity control is carried out changing -by means of the hydraulic manual pumps- the arms springs pressure.

Another posibility consists in changing the whole height of the sowing train by means of the two supporting turnbuckles. With the sowing train lifted, the sowing blades have a penetration angle of approximately 90 degrees. Consequently, seed is buried deeper in the soil. Working in such situation is adequate in hard soils. To do that, we must untighten the arms regulation nuts in order to lower the blades enough to copy the terrain unevennes. Tauten the pressure springs, since they'll be loose.

On the contrary, with the sowing train lowered, the blades have a smaller penetration angle and consequently seed is buried at less profundity. In this case we shall tighten each lowering arm nut in order to prevent the arms falling and the springs knocking out of place.

Lateral wheels

Lateral wheels avoid the folding sowing equipment deformation and allow its regulation to four different heights (fig. 15).

fig. 15

5.7 HYDRAULIC TURBINE

Machine type	Hydraulic motor		oil supply		
	absortion capacity (cm3)	turbine speed (rpm)	minimum outlet pressure (bar)	maximum return pressure (bar)	oil flow (l/min)
600/800	8	4500	160	10	44

Oil supply connection

Plug in the DN10 turbine hosepipe to a tractor pressure outlet and the DN16 turbine hosepipe to a tractor non-pressurized return.

Remember that the maximum return pressure is 15 bar. If this pressure is exceeded the motor can take damages.

Turbine regulation

A three way valve in the hydraulic motor controls the oil flow consumption and allows the adjustement of the turbine rotation speed. If the tractor has its own flow regulator, it is preferable to use this regulator to adjust the turbine rotation speed, keeping the three way valve fully opened.

The turbine rotation speed must be from 4500 r.p.m.

If the oil heats up too much due to an excess of tractor-pumped oil flow or a lack of tractor oil reserve, it will be necessary to add an extra oil tank to the seed drill.

If the oil flow delivered by the tractor hydraulic pump is insufficient for feeding the turbine hydraulic motor or any other necessary element, the installation of a power shaft activated auxiliary pump with oil tank and cooler will become essential. Consult the manufacturer.

5.8 LAND CULTIVATOR

The land cultivator function is to prepare the soil just before sowing. Its work must be superficial, except for the cultivation tines situated over the tractor wheel tracks. This tines must be regulated in order to erase the traces.

The work profundity can be regulated by means of the two hydraulic pistons that join this equipment to the machine main body.

5.9 LEVELLER

The leveller work is fundamental for the obtention of an uniform depth sow. Each leveler section is adjusted in height and pressure by means of a spindle (fig. 16). The soil dragged should not overflow the leveler plate.

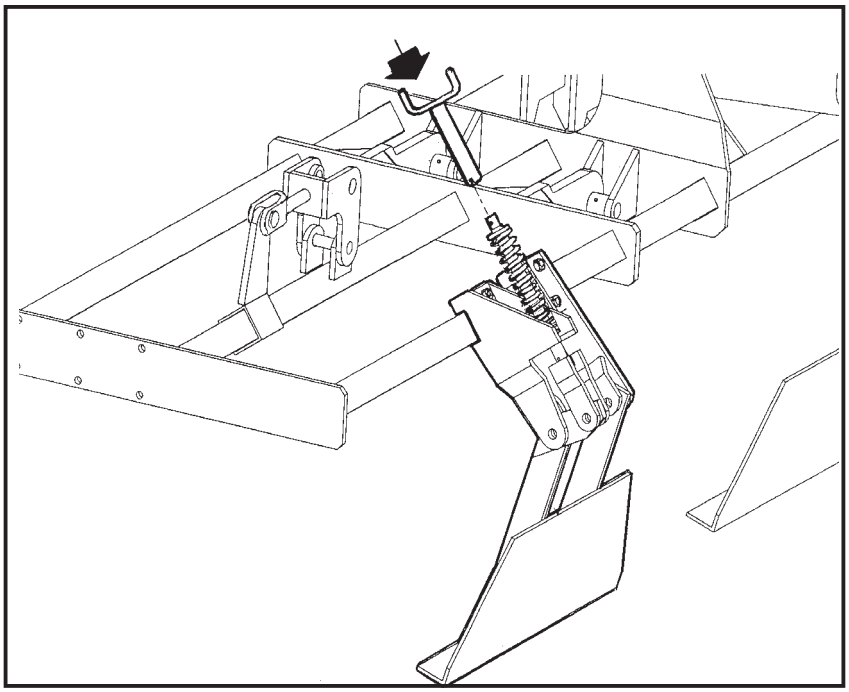


fig. 16

5.10 SPRING HARROW

The spring harrow has several regulations for a good adjustmet to different soil types:

1- In height, by means of the inferior nut (1, fig. 17).
2- In pressure, by means of the superior nut (2, fig. 17).
3- Working angle, shifting between the three assembly bolt positions (3, fig. 17).

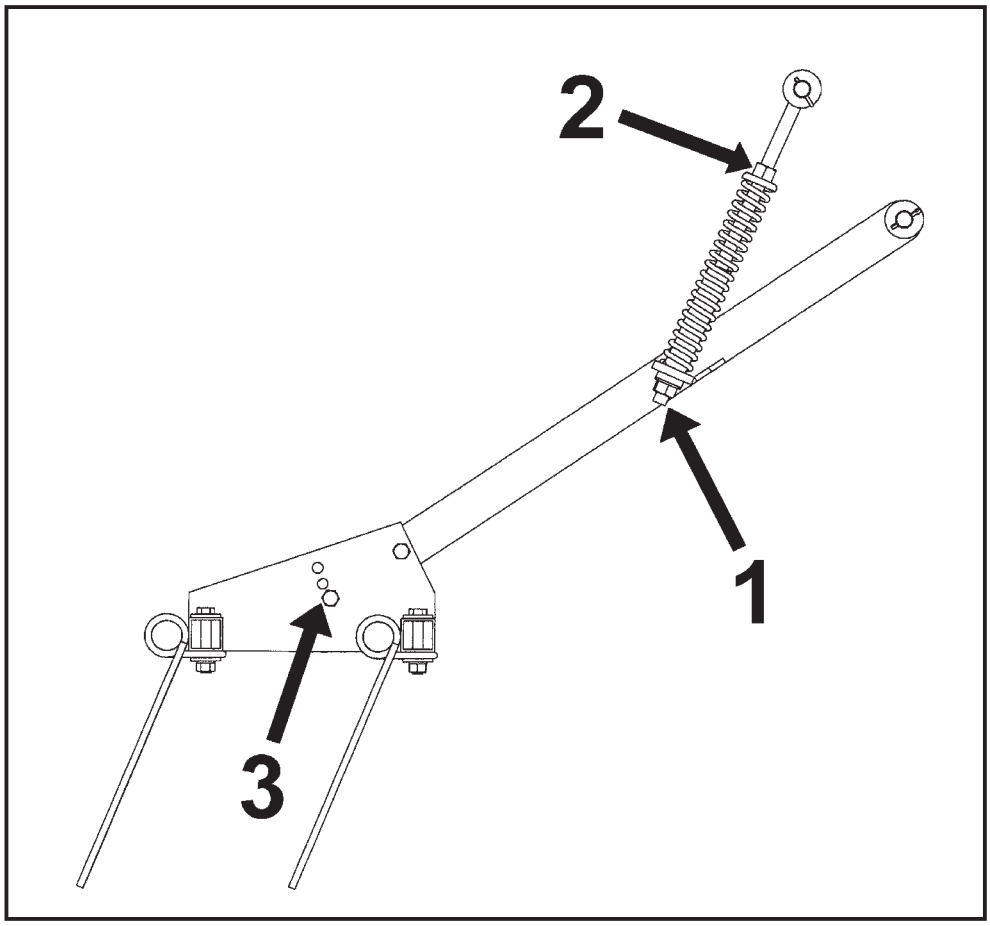


fig. 17

5.11 HYDRAULIC DISC TRACERS

The disc tracers are assembled in both sides of the folding sowing train. They are hydraulically activated, and they reach automatically its transport safety position when the sowing train is folded.

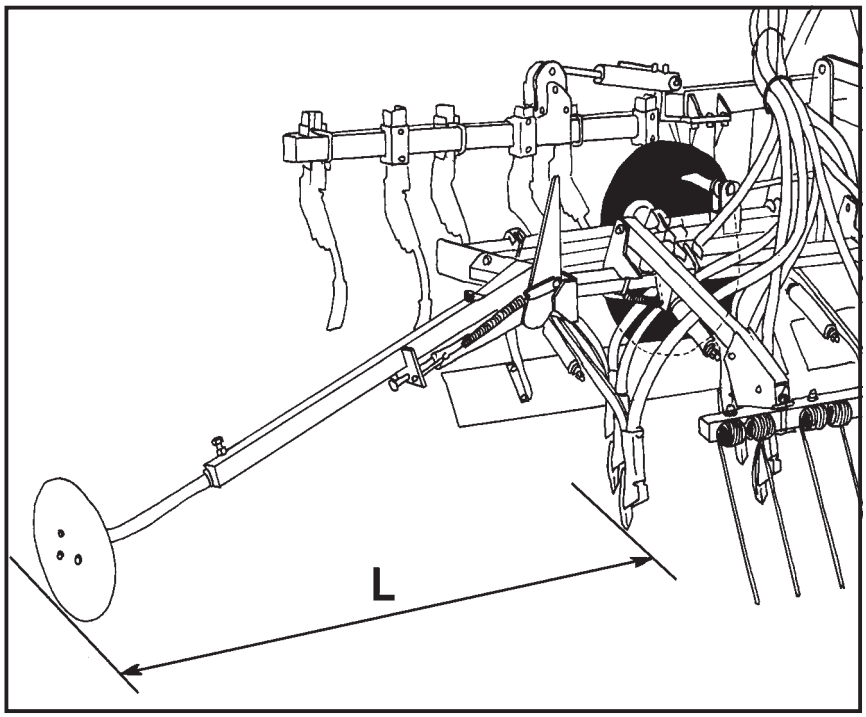


fig. 18

Its length can be adjusted and the discs oriented in order to obtain an adequate penetration angle. For calculate the horizontal distance between the disc and the outer sowing row (L, fig. 18) use the following formula:

$$L = \frac{\text{seed drill working width - tractor gauge + 12,5}}{2}$$

NOTE: make all calculations using cm as length unit

Beware of directing excessively crossways the discs, this could produce serious damages to the equipment.

Pressured oil can penetrate skin and cause serious injuries. Keep in good condition the hydraulic hosepipes.

Never place under the disc tracer or in its action range.

6. CONTROL MONITORS

1. Overview

The *Sola Neumasem Drill Control* monitors several functions of the seed drill, sets the seeding width, and controls the tramlining function of both conventional and pneumatic type seed drills. The instrument has an illuminated 4-digit display with 6 display functions and alarm functions for forward speed, fan rpm, seed distribution shaft rpm and hopper level.

The speed and area functions are displayed in metric units.

The instrument indicates;

- Forward Speed (plus low speed alarm)
- Part Area and Total Area worked
- The current bout number and tramline bouts for the selected tramlining sequence.
- Fan rpm (plus low/high speed alarm)
- Seed Distribution Shaft rpm (plus low speed alarm)
- Hopper level low (plus alarm)

There are two memory registers (Total 1 and Total 2) to record area worked. The area is accumulated to both memory registers. Area totals and all calibration data are automatically stored in memory when the instrument is powered off.

The instrument also indicates whether seeding at part width or full width, or that the micro-metering ratio (for small seed) is in effect.

Normal Display Mode

The instrument has a normal display mode displaying the work functions. Select a channel by pressing the  button once or more.

When the drill is moving, the selected channel is displayed for 10 seconds before defaulting back to the tramline display ( channel).

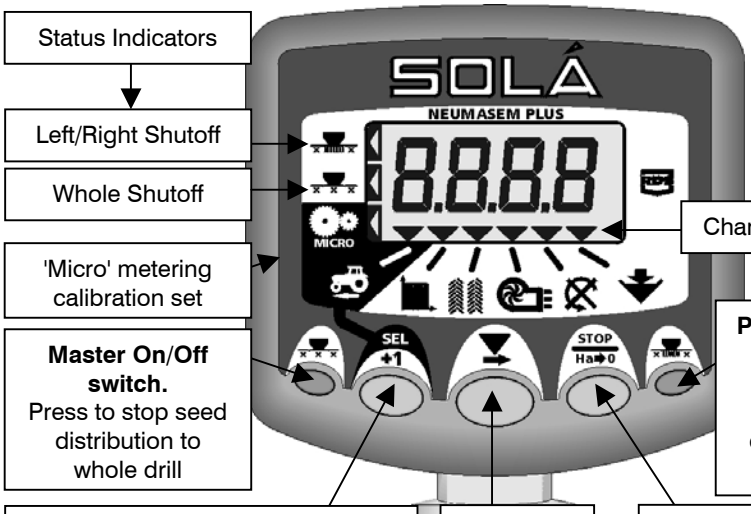
Programming Modes

There are 2 programming modes with various calibration factors and default settings.

Many of these settings are made on installation and do not normally need to be changed unless the instrument is switched onto a different drill. These settings are appended to the back of this manual. The operator does not normally need to refer to them.

2. The Control Switches

There are five switches on the front panel used individually or in combination to select, programme, or reset a function.



Status Indicators

Left/Right Shutoff

Whole Shutoff

'Micro' metering calibration set

Master On/Off switch.
Press to stop seed distribution to whole drill

Channel Indicators

Partial seeding width.
Press to stop seed distribution to left/right wing

With channel 1 selected, press and hold for 3 seconds to set calibration for the 'Micro' metering option (small seed).

Press and hold for 3 seconds again to recalibrate for normal metering.

When Area channel is selected, press to select Area Total 1('**tot.1**') or Area Total 2 ('**tot.2**').

Select the channel then either **PRESS** **+1** to manually advance the Bout Number
OR
HOLD continuously to select the programming mode, and select the tramline sequence.

Select Display Channel

PRESS to hold the current bout number

HOLD to
to reset the currently displayed Area Total

Channel 1	Forward Speed
Channel 2	Area Total 1 or 2
Channel 3	Current/Tramline Bout
Channel 4	Fan RPM
Channel 5	Seed Shaft RPM
Channel 6	Hopper Level Low

3. Forward Speed

Display Forward Speed

Forward Speed displays for 10 seconds before returning to the tramline display.

If an alarm condition occurs, the display will default to the appropriate channel, the buzzer will sound 5 beeps, and the display will remain flashing on that channel until either,

(i) the alarm condition is rectified.

(ii) the forward speed drops below 2km/h.

(iii) another channel is selected and the alarm ignored.

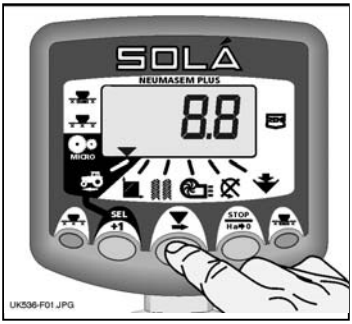


Figure 1: Display Forward Speed

Forward Speed Alarm

If you stop while the drill is in work, then the instrument will beep twice, and the display will alternate between '**0.0**' and '**ALAr**'

This continues until the speed is increased above the 2.0 km/hr threshold.

Disable Forward Speed Alarm

1. Press and hold 

whilst switching on the instrument to enter programme mode 2. The display should show '1' indicating the alarm is enabled.
2. Press  to set '0' and disable the alarm.
3. Switch the instrument off and on again to resume normal operating mode.

Speed Sensor Calibration

The forward speed sensor is magnetically operated and senses the seed shaft rotation. In order to display the correct speed and accumulate area correctly, the instrument must be programmed with the correct Speed Sensor Factor (SSF). This is the distance travelled between two signal pulses received from the sensor.

The S.S.F. is normally calculated automatically via the “Autocal” function.

‘Autocal’

For maximum accuracy, perform an auto-calibration in field conditions.

NOTE: The seed shaft gear ratio must be set for normal seed i.e. not set for 'micro' metering. If the gearing is set to the 'micro' ratio, speed calibration will be incorrect resulting in incorrect forward speed display and area accumulation when set at the normal metering ratio.

Figure 2: Start ‘Autocal’

1. Set two markers at 100 metres apart (328 feet). Choose a convenient reference point on the tractor/implement and position this point opposite the first marker.

2. Select the channel.

3. HOLD SEL +1 until the existing calibration factor is displayed.

4. Continue holding this button and press STOP. *The display flashes ‘**Auto**’ ready for calibration.*

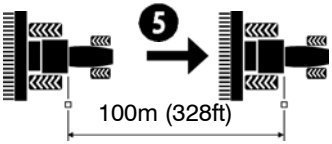


Figure 3: ‘Autocal’ distance

5. Drive the vehicle until the chosen reference point on the tractor/implement is opposite the second marker.

   The instrument counts and displays the sensor pulses received over the distance travelled.

6. Press the 

button to complete the Autocal routine (fig. 4).

   The calibration factor is automatically calculated and stored in memory.

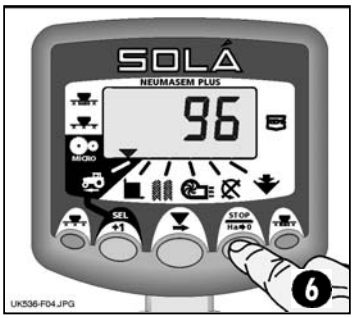


Figure 4: Stop 'Autocal'

4. Area Total / Implement Width

The area is derived from the forward speed and the programmed implement width and is accumulated to whichever total is selected on the display – total 1 or total 2.

Area will only accumulate while the drill is in work, i.e. forward speed is being registered, and is automatically calculated based on the seeding width selected.

The two separate area totals can be independently reset to zero.

Figure 5: Display Area Total

Display Area Total

1. Select the channel.
2. Press SEL +1 to cycle between the two area totals.

*The display will then show **'tot.1'** or **'tot.2'** before displaying the area accumulated since that total was last reset.*

Figure 6: Select Total 1 or Total 2

Area total displays for 10 seconds before returning to the tramline display.

Reset Totals

1. Select the channel.
2. Press SEL +1 to cycle between the two area totals.
3. Hold STOP for 5 seconds to zero that total.

Figure 7: Reset Total

View/Set Implement Width

In order for the instrument to accumulate area correctly, the implement working width must be programmed. The units are in metres.

View/Set Left/Right Wing Width

1. Select the channel.
2. Press to select left/right wing shutoff as shown by the left top indicator (fig. 8).
3. HOLD to enter programme mode 1. After 5 seconds the current wing width is displayed with the first digit flashing.
4. To change the value, continue holding the button and…
5. PRESS to select the digit or decimal point to change.
6. HOLD to change the selected digit (or move the decimal point).
7. RELEASE to select the next digit and repeat as above, otherwise simply release both buttons. The instrument will then return to the normal display mode.

Figure 8: View Wing Width

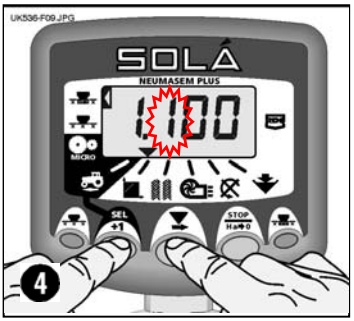


Figure 9: Set Wing Width

View/Set Full Width

As above except first press to *select full width shutoff* as shown by the left middle indicator (fig. 10).

Figure 10: Set Full Width

5. Tramlining

The display defaults to the channel after 10 seconds (unless the Area Total was selected).

There are five systems of tramlining - symmetric, asymmetric left, asymmetric right, 10 bout and 18 bout. The tramline bout is programmable from 1 to 15 in symmetric, asymmetric left and asymmetric right sequences.

Selection of asymmetric tramlining is denoted by a decimal point on the display between the current bout number on the left and the tramline bout number on the right. Left or right asymmetric tramlining is selected in the programming mode.

NOTE: There is an option in the programme mode to disable the tramline function altogether.

Manually advance the bout number

Press SEL +1 to advance the current bout number by 1.

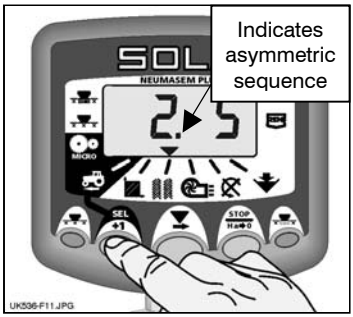


Figure 11: Advance bout number

Hold the bout number

Press STOP to 'hold' the current bout when the drill goes out of work.

The display will flash '**StOP**'.

Press STOP again to resume the normal bout sequence.

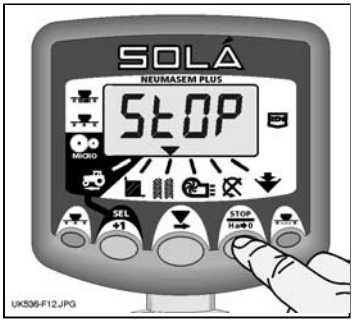
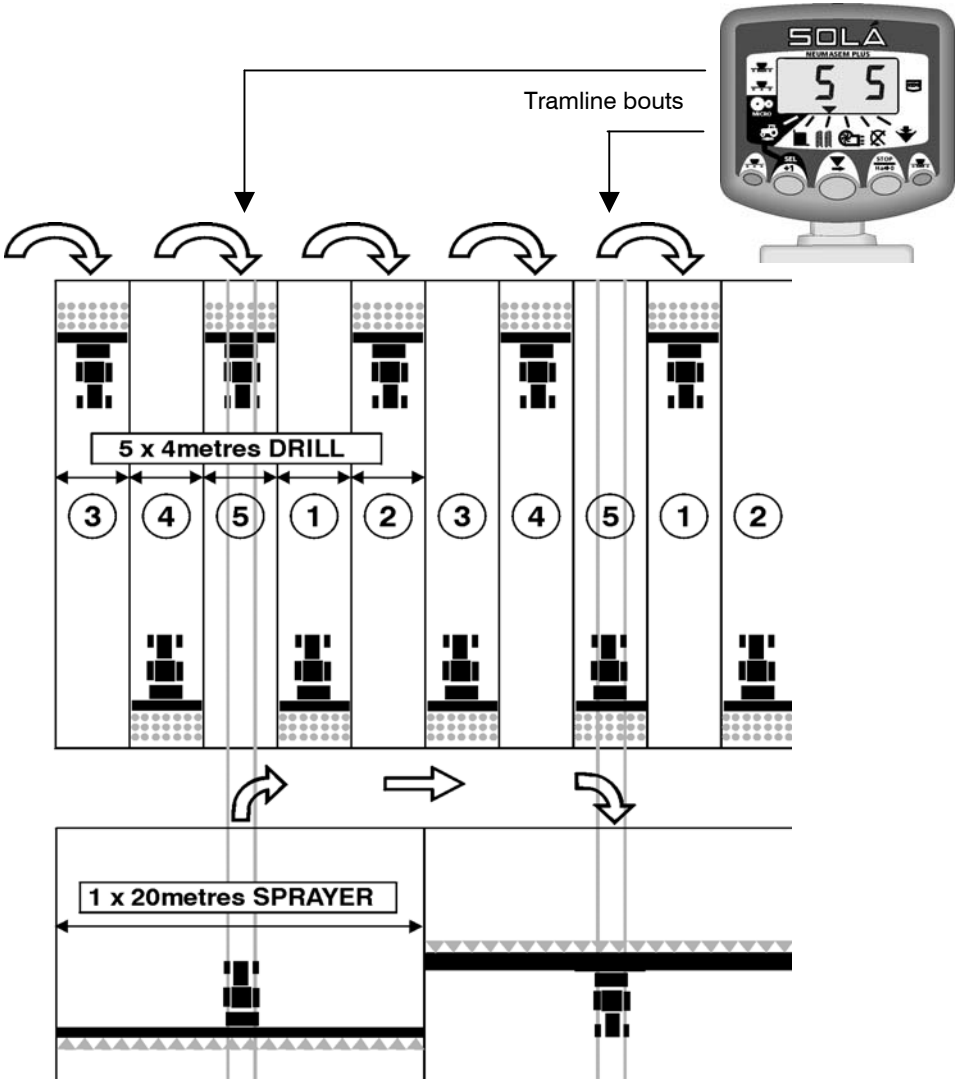


Figure 12: Hold bout number

Symmetric Tramlining Sequence

2+2 seed spouts are closed during the tramline bout only.

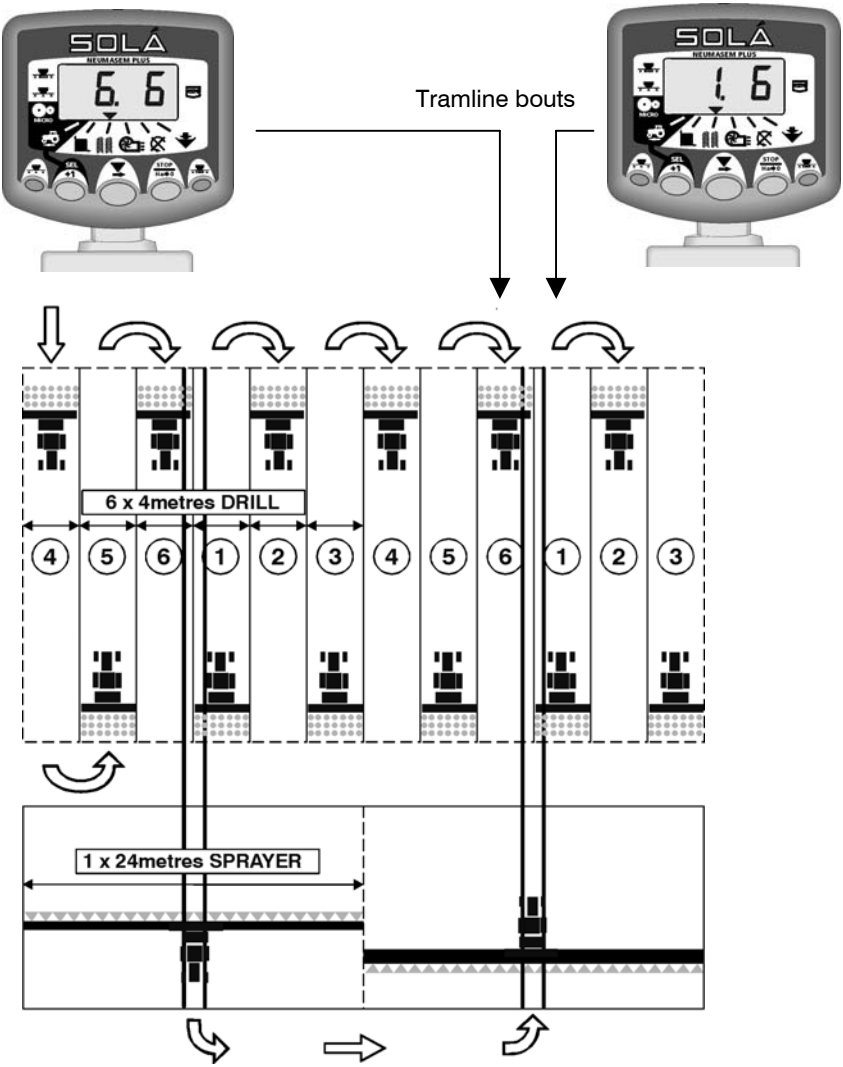
The instrument will beep once at the beginning of the tramline bout, and the display will continue flashing for the duration of the bout.



Asymmetric Left Tramlining Sequence

Two seed spouts are closed on the **left hand side** of the drill on the tramline bouts.

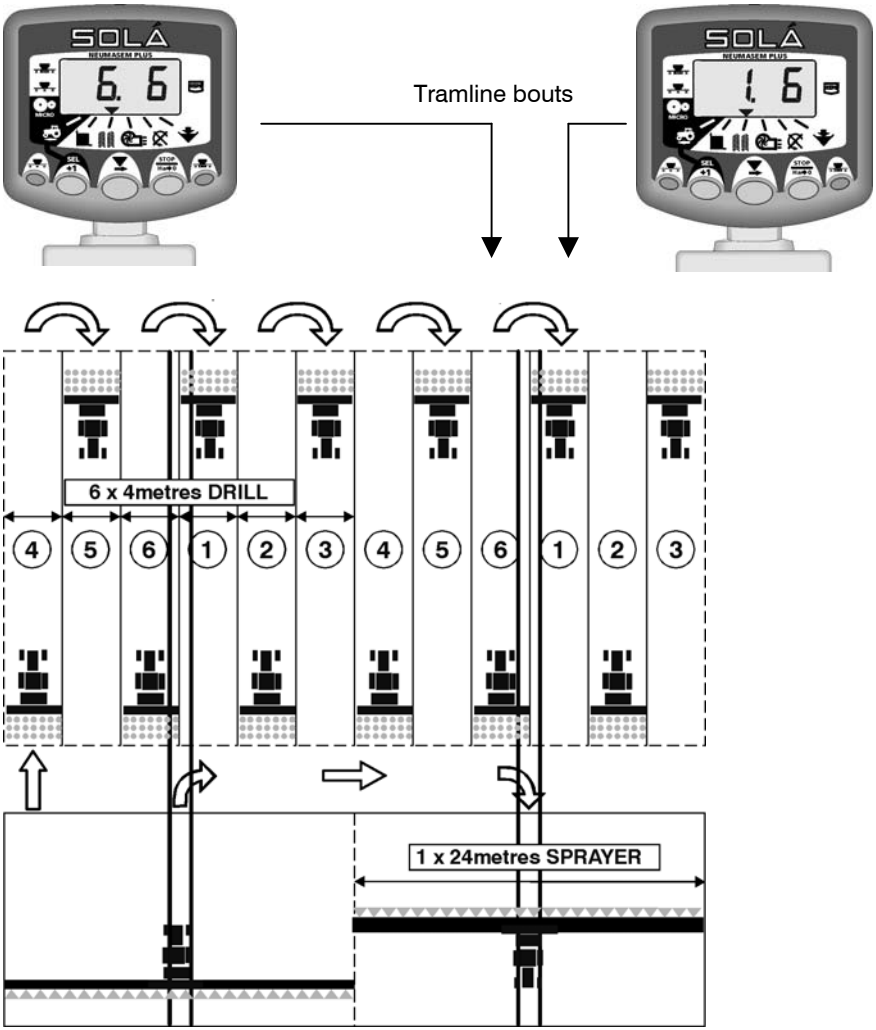
The instrument will beep once at the beginning of each tramline bout, and the display will continue flashing for the duration of the bout.



Asymmetric Right Tramlining Sequence

Two seed spouts are closed on the **right hand side** of the drill on the tramline bouts.

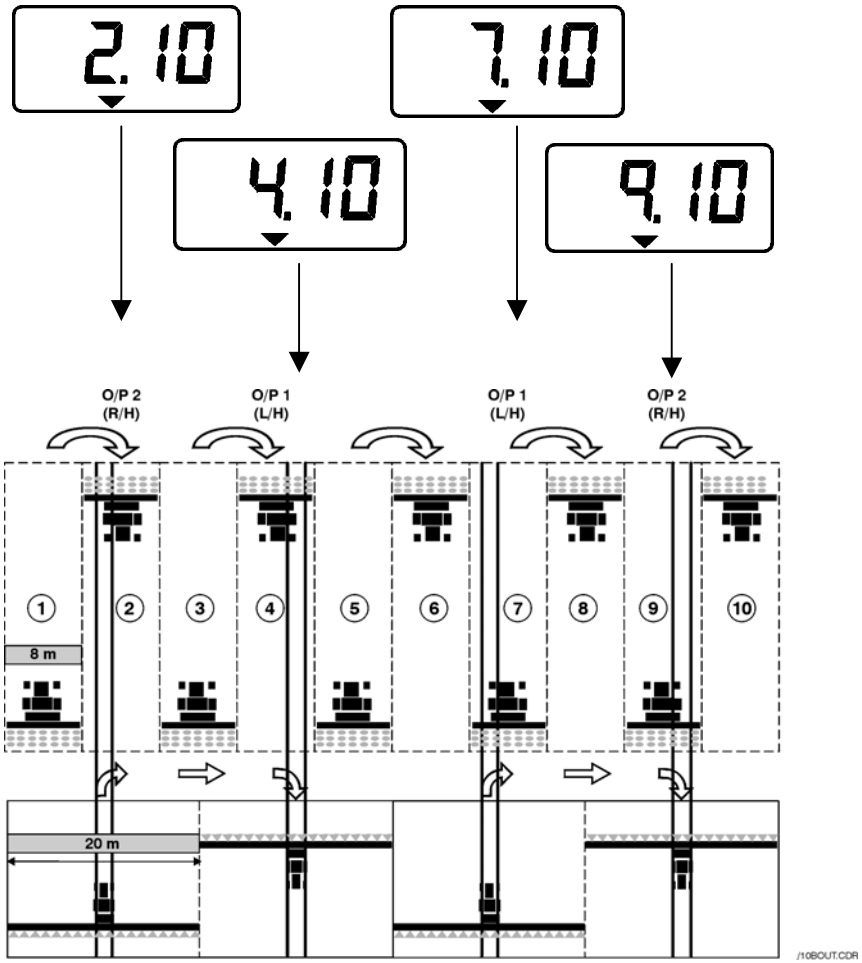
The instrument will beep once at the beginning of each tramline bout, and the display will continue flashing for the duration of the bout.



10-Bout Tramlining Sequence

For use with 4 metre drill/10 metre sprayer, or 8 metre drill/20 metre sprayer combinations. (2 x 2 left hand seed spouts are closed on bouts 4 and 7, and 2 x 2 right hand seed spouts closed on bouts 2 and 9). Starting on bout 1 requires turning **RIGHT** at the end of the first bout.

NOTE: To turn LEFT at the end of the first bout, advance the bout number to 6 before commencing drilling.

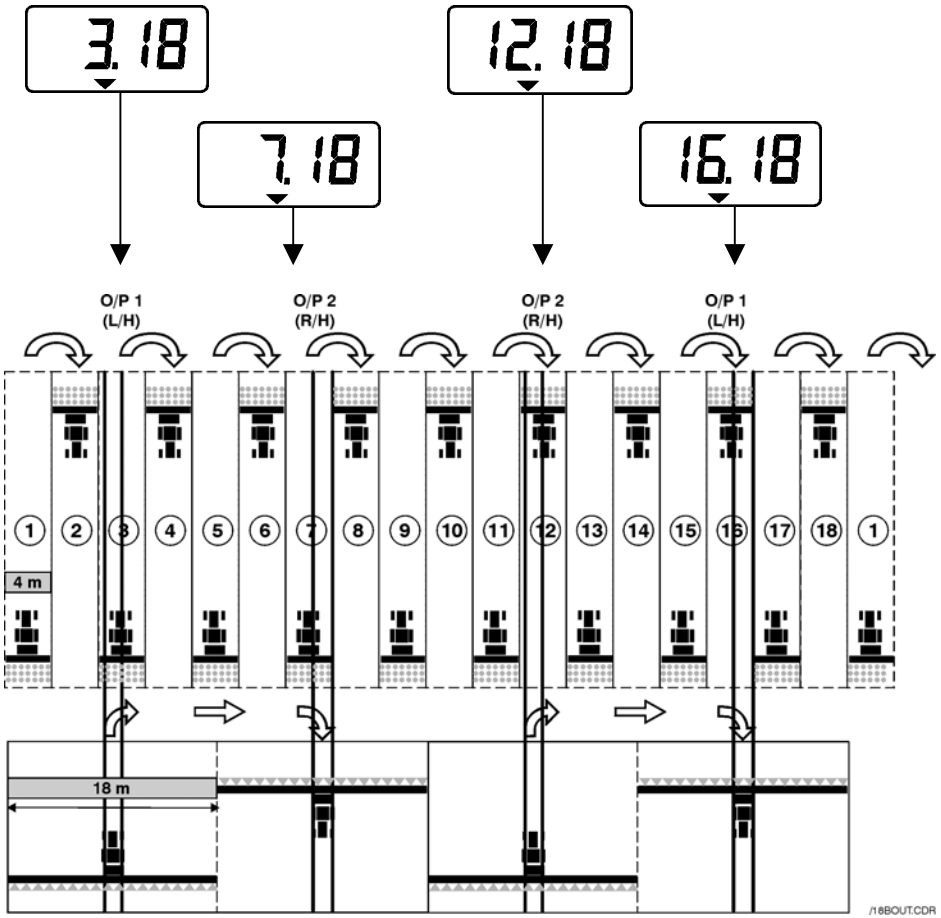


18-Bout Tramlining Sequence

For use with a 4 metre drill and an 18 metre sprayer. (2 x 2 left hand seed spouts are closed on bouts 3 and 16, and 2 x 2 right hand seed spouts closed on bouts 7 and 12). Starting on bout 1 requires turning **RIGHT** at the end of the first bout.

NOTE: To turn LEFT at the end of the first bout, advance the bout number to 10 before commencing drilling.

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



Selecting the Tramline Sequence

1. Select the channel.
2. Hold to enter programme mode 1.
   After 5 seconds the first two digits flash, indicating the tramline sequence currently set:-
   - 'SY' = Symmetric
   - 'AL' = Asymmetric Left
   - 'Ar' = Asymmetric Right
   - 'AS' = Special Asymmetric sequences e.g. 10 bout and 18 bout.
3. Continue holding the button and press and HOLD the button to select the required sequence.

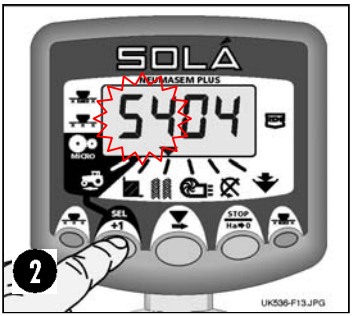


Figure 13: Tramline Sequence

Setting the Tramline Bout

4. PRESS and RELEASE the button to toggle between the tramline sequence and tramline bout number display.
   The 3rd and 4th digits flash indicating the tramline bout number currently set.
5. PRESS and HOLD the button to cycle the tramline bout from 1 to 15.
   NOTE: If either asymmetric left ('AL') or asymmetric right ('Ar') sequences are selected, the tramline output is also switched on for the bout following the target bout (i.e. bout 1).
   If the special asymmetric sequence ('AS') is selected, the only options for the tramline bout number are 10 and 18.

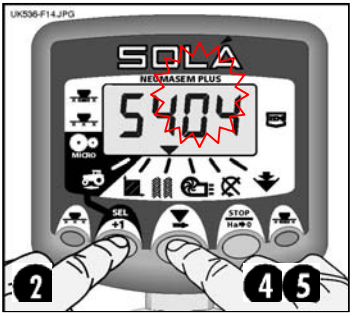


Figure 14: Tramline Bout Number

6. Fan Speed / Speed Alarms

Display Fan Speed

Select the channel.

Fan Speed displays for 10 seconds before returning to the tramline display.

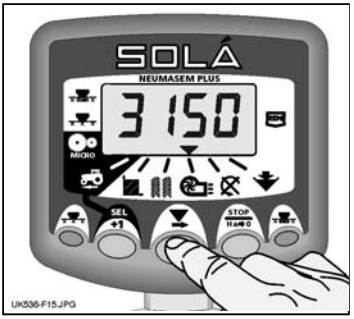


Figure 15: Display Fan Speed

Fan Speed Alarms

There is a programmable low-speed alarm and a non-programmable high speed alarm. An alarm condition causes the instrument to default to the fan speed channel, sound 5 beeps and flash the actual fan speed. The audible alarm will continue to sound every 30 seconds until the alarm condition is resolved.

NOTE: The alarm is temporarily inhibited if another channel is selected, or if the forward speed is less than 2 km/hr.

Thresholds: Low speed = 2700 rpm (default), High speed = 5000 rpm

Set Low Fan Speed Alarm

1. Select the channel.
2. Hold 

to enter programme mode 1.
The alarm threshold is displayed after 5 seconds. Continue holding the button and…
3. PRESS  to select the digit or decimal point

Figure 16: Low speed alarm threshold

4. HOLD  to change the selected digit (or move the decimal point).

5. RELEASE  to select the next digit and repeat as above, otherwise simply release both buttons. The instrument will then return to the normal display mode.

High Fan Speed Alarm

The high speed alarm is set at 5000 rpm and is not programmable.

7. Seed Distribution Shaft Speed

Display Shaft Speed

Select the  channel.

Shaft Speed displays for 10 seconds before returning to the tramline display.

Figure 17: Distribution Shaft speed

Distribution Shaft Speed Alarm

The default alarm setting is 0 rpm. When set >0, and the seed shaft rpm goes below the threshold or stops, the instrument will sound 5 beeps and will default to the  channel from the current channel selected.

The audible alarm will continue to sound every 30 seconds until the alarm condition is resolved.

NOTE: The alarm is temporarily inhibited if another channel is selected, or if the forward speed is less than 2 km/hr.

Set Alarm Speed for Distribution Shaft

1. Select the  channel.
2. Hold  to enter programme mode 1.
   The alarm threshold is displayed after 5 seconds. Continue holding the button and…
3. PRESS  to select the digit to change.

4. HOLD  to change the selected digit.

5. RELEASE  to select the next digit and repeat as above, otherwise simply release both buttons. The instrument will then return to the normal display mode.

NOTE: Setting '0' disables the alarm function.

8. Hopper Level

This display is left blank if the alarm function is disabled in programme mode 1.

When the alarm is enabled, when the seed level drops below the sensor fitted in the side of the hopper, the instrument defaults to this channel and sounds 5 beeps

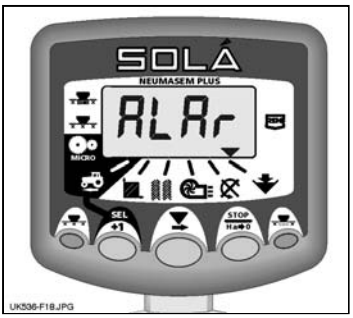


Figure 18: Hopper Low Alarm

Enable / Disable Hopper Level Alarm

1. Select the channel.
2. Hold to enter programme mode 1. Continue holding the button and…
3. PRESS to select 0 (Off) / 1 (On).

   The display will stay blank on this channel when the alarm is disabled.
4. Release both buttons. The instrument will then return to the normal display mode.

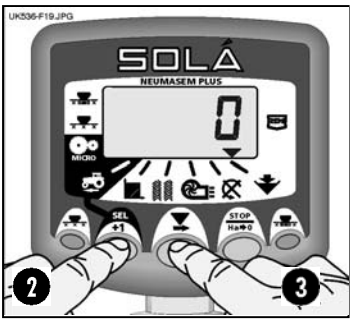


Figure 19: Disable Alarm

9. Summary of Programme

Most settings do not need to be accessed during normal. Default values shown in *[brackets]*.

		Programming mode 1	Programming mode 2	Programming mode s
	Operating Mode	Select channel, press and hold 'SEL/+1' to enter	Power on whilst holding 'SEL/+1' to enter mode. Use same key to select channel	Power on whilst holding 'STOP/HA-0' for 10 seconds to enter mode. Use same key to select channel
Channel 1	Forward Speed	Speed sensor factor & autocal	Forward speed alarm	
	(Km/h)	See tables	Default: 1 (on)	
Channel 2	Area x 2	Working width		Grand total area
	(Hectares)	See width		(Ha)
Channel 3	Tramlining	Tramline Sequence	Tramline option	
		Default: SY04	Default: 1 (on)	
Channel 4	Fan Speed	Low alarm speed	High alarm speed	Fan PPR
	(RPM)	Default: 3800 rpm	Default: 5000rpm	Default: 2.000
Channel 5	Shaft Speed	Low alarm speed		Shaft PPR
	(RPM)	Default: 0rpm		Default: 1.000
Channel 6	Hopper Alarm	Alarm on/off		
		Default: 1 (on)		

7. MAINTENANCE

7.1 GREASING

Lubricate with calcic dense grease the following parts:

-Every 100 ha grease the articulations from the folding parts.
-Every 400 ha grease the wheel axles.

7.2 TYRE PRESSURE

The following data is corresponding with the full-load pressure prescribed by the tyre manufacturer

tyre 550/60-22,5 --- 3,00 bar

Generally, in poor prepared soils, we recommend to reduce a bit the pressure in order to overcome the terrain irregularities and achieve more sowing regularity.

7.3 NUTS AND BOLTS

After some working hours, all bolts must be inspected and tightened if necessary, specially those tying the coulters. For these bolts, a special tube key (1, fig. 22) is supplied with the machine.

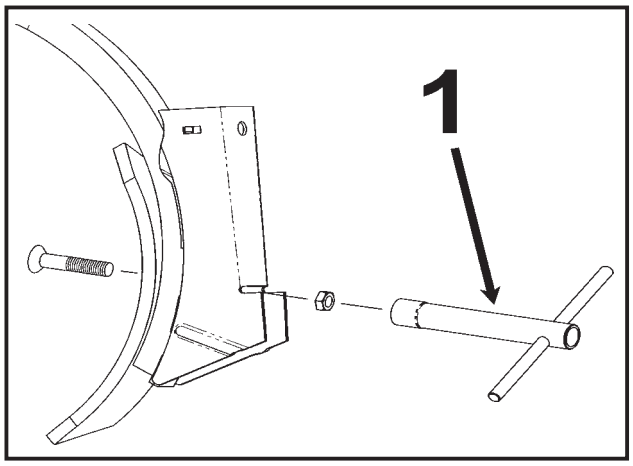


fig. 22

7.4 DISTRIBUTION HEAD AND HOSEPIPES

Before working, make sure that there are no obstructions in the distribution heads or in the seed transport hosepipes. In order to do that, with the turbine spinning and the hopper filled, give some turns to the transmission wheel until some seed is delivered by every arm. Stop the machine, remove both distribution head covers and check that there are no strange bodies inside.

8. DOSAGE TABLE

The quantities seen in the table are for guidance only. The flow can vary due to preservation powder, seed size, density and humidity, etc.

For a precision sowing, follow the process described in sections 5.4 and 5.5 in this booklet.

seed	wheat	rye	barley	oats	beans	peas	lupin	carobs	corn	grass
specific weight (kg/l)	0,77	0,74	0,68	0,5	0,85	0,81	0,76	0,83	0,79	0,36
adjustment value	normal seed kg/ha (adjustment wing N)									
10*	33	33	32	24	23	21	28	32	8	.
15*	51	49	48	35	41	40	45	51	24	19
20*	69	67	64	47	61	59	61	69	47	25
25*	85	83	79	57	79	77	79	89	69	33
30	104	100	95	71	97	97	96	108	92	41
35	123	117	111	81	116	117	113	127	115	49
40	140	134	127	93	135	136	129	146	138	.
45	158	151	143	105	154	155	147	166	156	.
50	174	168	159	117	172	174	164	184	175	.
55	192	184	174	129	191	194	182	203	194	.
60	210	200	191	142	210	214	198	222	212	.
65	228	218	206	154	228	232	216	242	231	.
70	247	235	222	166	247	251	234	260	250	.
75	264	252	238	178	266	270	251	279	267	.
80	282	270	252	190	283	288	268	298	286	.
85	298	287	268	200	302	310	286	316	304	.
90	316	302	284	212	320	328	302	336	323	.
95	335	319	300	224	338	347	320	355	342	.
100	352	336	316	236	356	366	336	374	360	.
105	370	354	332	248	374	386	354	394	380	.
110	387	371	348	260	394	405	371	413	398	.

NEUMASEM 901

seed	rape		clover		grass		turnips	
specific weight (kg/l)	0,65		0,8		0,39		0,7	
adjustment value	small seed kg/ha (adjustment wing F)							
2,5	2,2	1,1	2,3	1,15	-	-	2,5	1,25
5	4,6	2,3	5,3	2,65	-	-	5	2,5
7,5	6,8	3,4	8,6	4,3	2,8	1,4	7,5	3,75
10	9,1	4,55	12	6	5,2	2,6	10	5
12,5	11,4	5,7	15,3	7,65	7,2	3,6	12,5	6,25
15	13,7	6,85	18	9	9,2	4,6	15	7,5
17,5	15,9	7,95	21,3	10,65	11,2	5,6	17,5	8,75
20	18,2	9,1	24	12	13,2	6,6	20	10
22,5	20,5	10,25	26,6	13,3	15	7,5	21,5	10,75
25	22,8	11,4	27,5	13,75	16,2	8,1	23	11,5
	N	M	N	M	N	M	N	M

N = normal dosage M = microdosage

FLOW TEST

seed drill	turns
600/48	33,5
800/64	25,0

Turns to the transmission wheel for simulating 250 m2 sowing. The flow is obtained multiplying the result by 80.

550-60-22,5 TYRE

* When the quantities to deliver are small (dispenser cell width <= 25 mm) a more uniform sow can be achieved by means of the microdosage system, even when sowing cereal and big seeds.

8 METERS								
SMALL SEED	**RAPE**		**FIELD CLOVER**		**GRASS**		**TURNIPS**	
Spec. weigth (kg/l)	**0,65**		**0,77**		**0,39**		**0,7**	
Adj. dosing scale value	**SMALL SEED (kg/ha)**							
2,5	1,09	0,55	1,16	0,59	-	-	1,30	0,62
5	2,33	1,16	2,67	1,30	-	-	2,33	1,23
7,5	3,49	1,71	4,38	2,19	1,44	0,72	3,83	1,89
10	4,65	2,33	6,18	3,08	2,67	1,30	5,13	2,57
12,5	5,80	2,94	7,89	3,90	3,70	1,85	6,46	3,22
15	7,07	3,49	9,22	4,65	4,73	2,36	7,67	3,83
17,5	8,17	4,04	10,88	5,41	5,74	2,88	8,94	4,49
20	9,33	4,65	12,31	6,18	6,79	3,36	10,27	5,13
22,5	10,54	5,27	13,64	6,79	7,67	3,83	11,04	5,52
25	11,70	5,80	14,08	7,07	8,34	4,17	11,81	5,91
	NORMAL	MICRO	NORMAL	MICRO	NORMAL	MICRO	NORMAL	MICRO

8 METERS										
NORMAL SEED	**Wheat**	**Rye**	**Barley**	**Oats**	**Beans**	**Peas**	**Lupin**	**Carob**	**Corn**	**Corn**
Spec. weigth (kg/l)	**0,77**	**0,74**	**0,68**	**0,5**	**0,85**	**0,81**	**0,76**	**0,83**	**0,79**	**0,36**
Adj. dosing scale value	**REGULAR SEED (KG/HA)**									
5	-	-	-	-	-	-	-	-	-	-
10	17,1	17,1	16,5	12,1	11,6	10,9	14,4	16,5	4,1	-
15	26,0	25,3	24,6	17,7	21,2	20,5	23,3	26,0	12,3	9,6
20	35,6	34,2	32,8	23,7	31,5	30,1	31,5	35,6	24,0	13,0
25	43,9	42,5	40,4	29,3	40,4	39,7	40,4	45,9	35,6	17,1
30	53,4	51,3	48,6	36,4	50,0	50,0	49,3	55,2	47,3	21,2
35	62,9	60,2	56,9	42,0	59,6	60,2	58,0	65,1	59,1	25,3
40	71,8	68,5	65,1	48,0	69,0	69,6	66,3	74,5	70,7	-
45	80,6	77,3	73,4	54,1	78,9	79,5	75,1	85,0	80,1	-
50	88,9	86,1	81,7	60,2	88,3	88,9	84,5	94,4	89,4	-
55	98,8	94,4	88,9	66,3	97,7	99,4	93,3	103,8	99,4	-
60	107,7	102,7	97,7	72,3	107,7	109,3	101,6	113,7	108,8	-
65	117,0	111,5	105,4	78,9	117,0	119,3	111,0	123,7	118,7	-
70	126,4	120,4	113,7	85,0	126,4	128,6	119,8	133,6	128,1	-
75	135,8	129,2	122,0	91,1	136,4	138,0	128,6	143,0	136,9	-
80	144,6	138,0	129,2	97,2	145,2	148,0	137,5	152,9	146,3	-
85	152,9	147,4	137,5	102,7	154,6	159,0	146,3	162,3	156,2	-
90	162,3	154,6	145,8	108,8	164,5	168,4	154,6	172,3	165,6	-
95	171,7	163,4	154,0	114,8	173,4	177,8	164,5	182,2	175,0	-
100	180,5	172,3	162,3	120,9	182,7	187,7	172,3	191,6	184,9	-
105	189,4	181,6	170,6	127,5	191,6	197,6	181,6	202,1	194,9	-
110	198,8	190,5	178,9	133,6	202,1	207,6	190,5	211,4	204,3	-

* When the quantities to deliver are small (dispenser cell width <= 25 mm) a more uniform sow can be achieved by means of the microdosage system, even when sowing cereal and big seeds.

MAQUINARIA AGRICOLA SOLA,S.L.
Ctra. de Igualada s/n. Apdo.Correos,11
08280 CALAF (Barcelona) ESPAÑA
Tel. 34 93 868 00 60*
Fax. 34 93 868 00 55
www.solagrupo.com
e-mail:sola@solagrupo.com