ARGO

STARTING
MANUAL
MAINTENANCE
DOSAGE

Please read and follow this operating manual before putting the machine into operation.

MAQUINARIA AGRÍCOLA

SOLA

SOLÀ *seed drills, planters and fertilizer spreaders are manufactured in a highly specialized environment and our factory has a vast network of satisfied customers.*

SOLÀ *machines use highly advanced technology and are guaranteed to work without malfunctions in a large variety of conditions. The* ***SOLÀ*** *machines are provided with easy-to-use and efficient devices and perform excellently with only minimum operator maintenance.*

This manual will help you use your ***SOLÀ*** *product with the maximum efficiency.*

ISO 9001
BUREAU VERITAS
Certification

Certified quality system

1st Edition – October 2014
Ref.: CN-811094/GB
Created by: INTEGRUM

1- INTRODUCTION

It is essential to read and follow the instructions and recommendations in this manual before operating the machine **ARGO**. Careful reading enables maximum operator efficiency, prevents accidents and damage, and increases the machine's capacity and life expectancy.

Please ensure that this manual has been read by any person involved in performing **operational tasks,** (including preparation, dealing with mechanical problems and supervising the machine), **maintenance** (inspection and technical assistance) and **transport**.

For your safety, please follow these technical safety instructions as **SOLÀ** will not be responsible for damages caused by not observing the information provided.

In the first chapters you will find the Technical Characteristics and Safety Instructions. Basic concepts that are required to operate the machine are explained in the Starting, Adjusting and Maintenance sections.

The last part of this manual consists of Dosage Tables, detailed by all types of seed, fertilizer, insecticide micro granulator and helicide micro granulator.

SOLÀ RETAINS THE RIGHT TO MODIFY ILLUSTRATIONS, TECHNICAL DATA AND WEIGHTS INDICATED IN THIS OPERATING MANUAL, IF THESE CHANGES HELP TO IMPROVE THE QUALITY OF THE MACHINES.

2- SAFETY INSTRUCTIONS

2.1 SAFETY SYMBOLS

In this operating manual you will find three different symbols relating to safety:

TO WORK MORE EASILY WITH THE MACHINE.

TO PREVENT DAMAGE TO THE MACHINE AND OPTIONAL EQUIPMENT.

TO PREVENT PHYSICAL INJURY.

On the machine you will find the following warning pictograms:

Read the instructions carefully and observe the safety advice given in the operating manual.

During the coupling maneuver, stay away from the rear part of the tractor. Check nobody stands in the operational area of the telescopic folding parts.
Risk of serious physical injury.

While maintaining or repairing the planter, stop the tractor's engine and prevent it from starting. The ignition key must be removed.

Risk of being crushed when working under the machine, please secure the machine to prevent this risk. **Risk of serious physical injuries.**

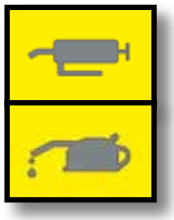
It is forbidden to ride on the machine during operation. **Risk of serious physical injuries caused by falling.**

Danger of infection from escaping hydraulic fluid at high pressure! This can inflict serious injuries with potentially fatal consequences if it passes through the skin and into the body. **Keep the hose lines in good condition. Risk of serious physical injuries.**

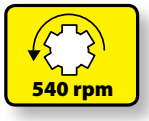
Never stand under the track markers nor inside their action area. **Risk of serious physical injury.**

Do not exceed maximum load

Coupling point for loading and unloading the machine by crane. See section 2.3 LOADING AND UNLOADING INSTRUCTIONS.



The parts signaled with this pictogram should be kept in good condition and greased. See section 9.2 GREASING AND LUBRICATION.



PTO's turning direction and speed.

2.2 GENERAL SAFETY REGULATIONS

- Before starting the machine, please check the machine is in good condition for work and is safe for road use.

- Check that visibility is clear around the machine and there is no person in the working area.

- In thoroughfare, please observe traffic signs and regulations.

- It is forbidden to ride on the machine or climb into the machine when it is running.

- Before using the machine, the user must be familiar with all operating elements.

- Please be extremely careful when coupling and uncoupling the machine to the tractor.

- Please check that the PTO shaft is in good condition and well protected.Prevent the protective tube from turning by holding both the tube and chain provided for this purpose.

- Mount the PTO shaft's transmission only when the tractor's engine is off.

- Before connecting the PTO shaft, be sure that the danger zone surrounding the machine is clear.

- Never leave the tractor's driver's seat while the machine is in operation.

- Do not deposit external elements inside the hopper.

- When maintaining the hydraulic system of the planter, make sure that it is depressurized and the tractor's engine is off.

- Please regularly check the condition of the tubes and hosepipes in the hydraulic system. These parts age naturally and their life should not surpass 6 YEARS. Please replace when necessary.

- Before transit with a machine with folding frame coupled to the tractor, check that the frame is completely folded.

- When raising the planter, the front axle is unloaded. Ensure that the machine has enough load to prevent it overturning. At this time you must ensure that the condition of both the steering and the brakes is optimal.

- During transit with the raised planter, block the lowering switch. Before leaving the tractor, lower the planter onto the ground and remove the tractor's starting key.

- Always use enough supporting elements when maintaining the machine in a raised position to prevent the machine from lowering or falling.

- Before starting to plant a field, evaluate the risks coming from the terrain: pronounced slopes, possible contact with high-voltage overhead lines due to an uneven ground or due to the position of the movable or folding parts of the planter.

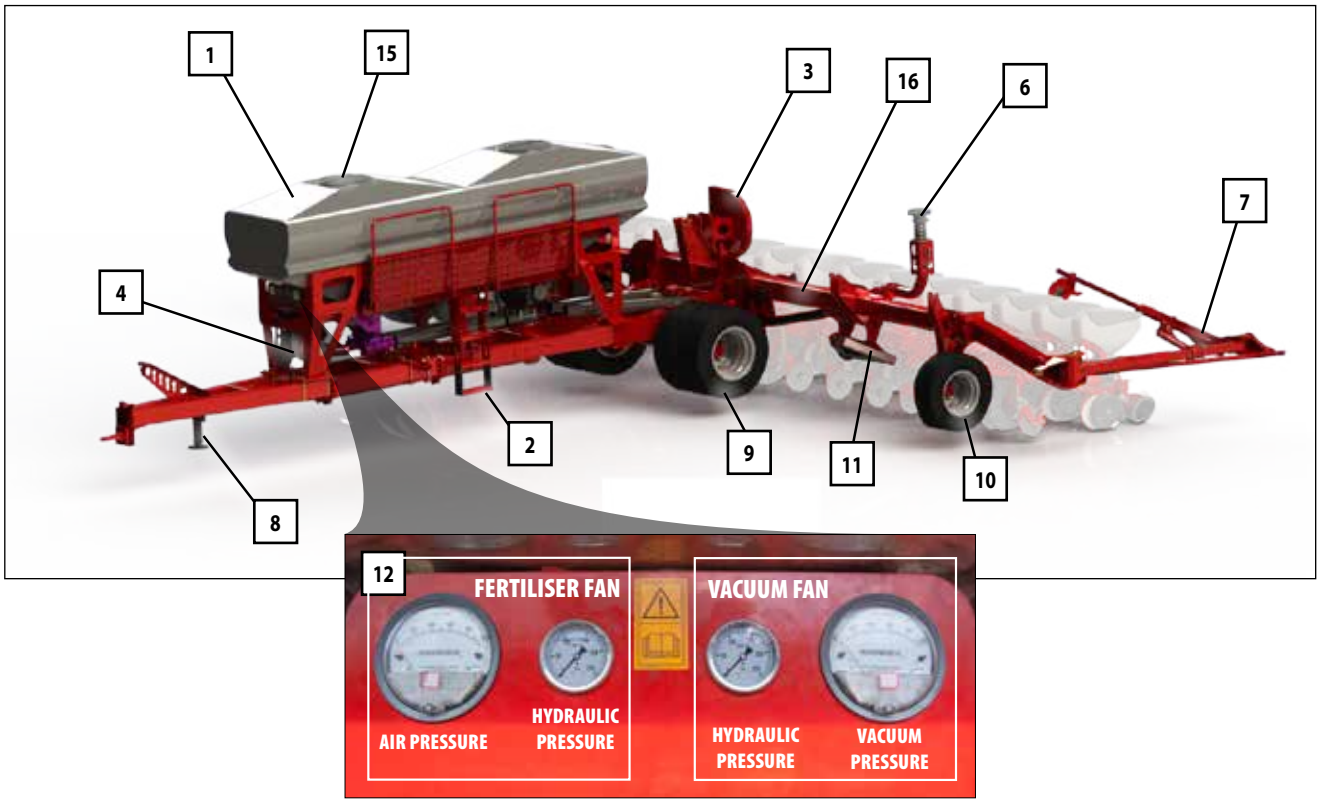
2.3 LOADING AND UNLOADING INSTRUCTIONS

THESE OPERATIONS SHOULD BE PERFORMED ONLY BY QUALIFIED AND EXPERIENCED PERSONNEL.

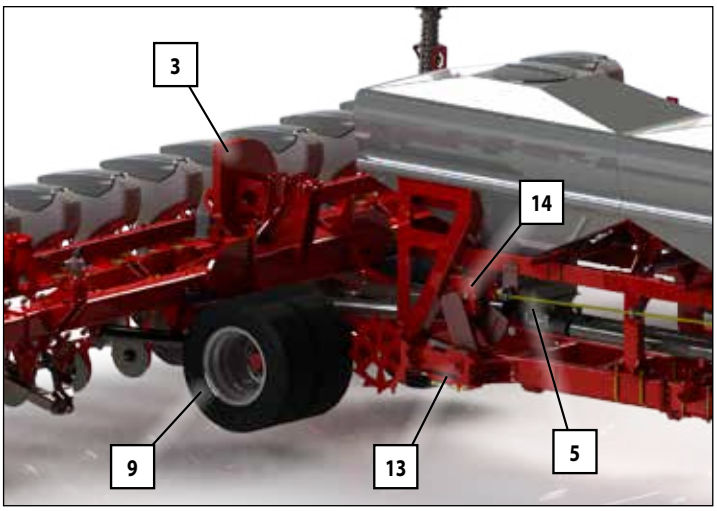
WHEN THE PLANTER IS DELIVERED, IT SHOULD BE IMMEDIATELY CHECKED TO DETECT POSSIBLE DAMAGES DURING TRANSPORTATION OR MISSING PIECES. ONLY THE IMMEDIATE REPORTING OF THIS TO THE DELIVERER WILL RESULT IN COMPENSATION.

3. OVERVIEW

3.1 MACHINE OVERVIEW

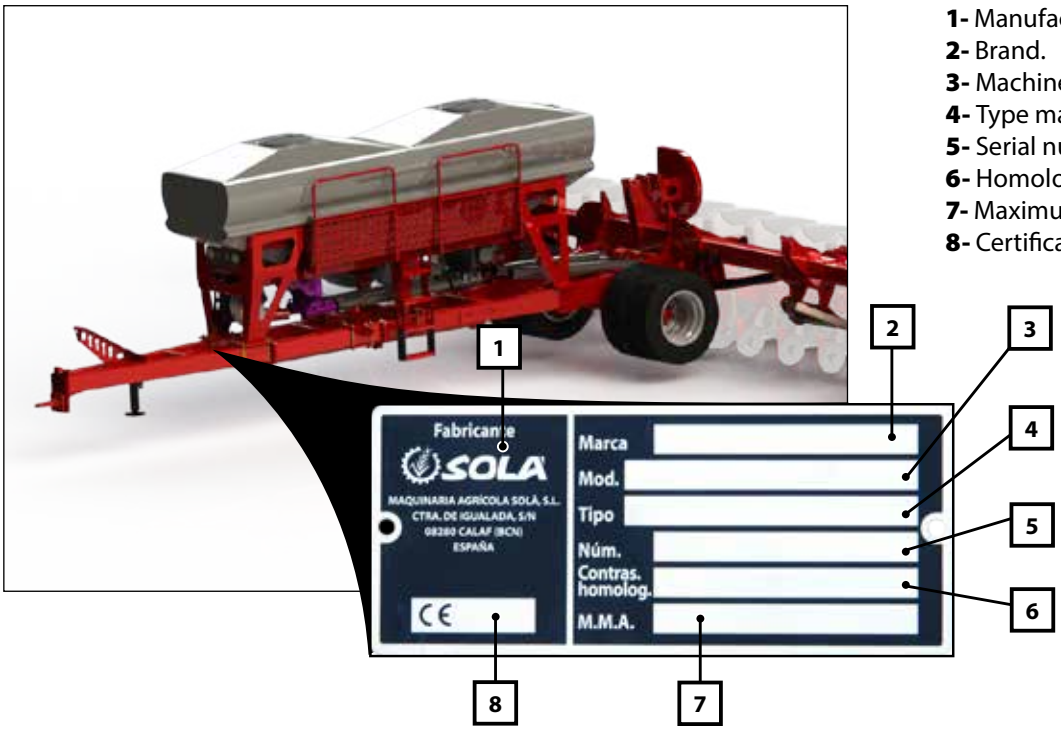


1- Fertilizer hopper.
2- Acces ladder
3- Blower.
4- Fertiliser fan.
5- Distributors
6- Distributor head.
7- Track markers.
8- Supporting leg.
9- Flotation wheels.
10- Wing wheel
11- Three point coupling.
12- Gauges.
13- Transmission wheel.
14- Gearbox.
15- Hopper cover
16- Wing



3.2 MACHINE IDENTIFICATION

Every machine has an IDENTIFICATION PLATE that specifies:



1- Manufacturer.
2- Brand.
3- Machine model.
4- Type machine.
5- Serial number.
6- Homologation number.
7- Maximum authorized mass (Kg.).
8- Certificado CE.

3.3 USE ACCORDING TO DESIGN

The machine **ARGO** has been designed specifically for single-seed sowing of cereal and other grain seeds.

The machine has been designed to work using an agricultural tractor with lifting unity and three-point universal linkage.

This machine is able to work by using either a PTO shaft plugged into the tractor's PTO or by means of a hydraulic engine.

If the machine is used in circumstances other than those specified above, the manufacturer will not be held responsible for any damage caused to persons or to the machine.

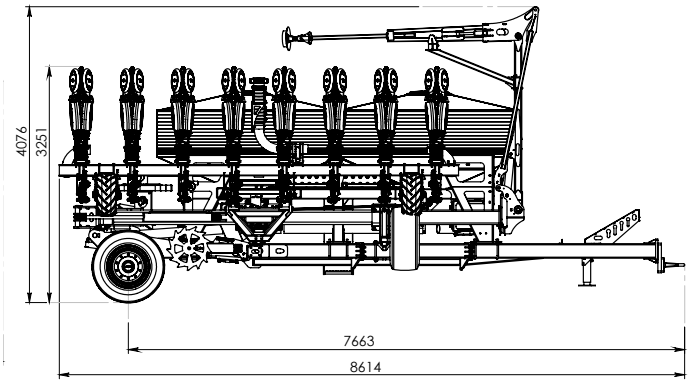
The user must observe all regulations concerning safety, traffic and hygiene.

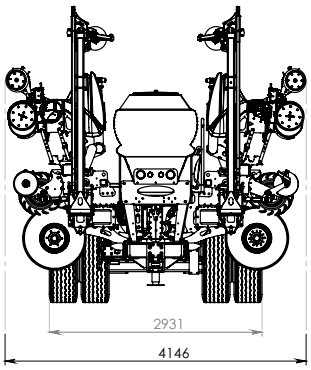
If the machine is modified by the user, the manufacturer's warranty is cancelled. SOLÁ will not be held responsible for any damage caused to persons or to the machine.

The use of seeds with a high moisture content should be avoided since they can cause blockages.

4. TECHNICAL CHARACTERISTICS

ARGO	
MODELO	**PROSEM**
TOTAL WIDTH (m)	13,3
ROWS / ROW SPACING (CM)	16 / 70
HOPPER CAPACITY FERTILISER (L)	2 x 2.500
FLOTATION WHEELS	385/55 R22.5
LEVEL WHEEL	400/60-15.5
TRACK MARKERS (M)	6
MAX. PRESSURE HYDRAULIC. (BAR)	210
WORKING SPEED (KM/H)	2 - 9
WEIGHT (KG)	13.000
TRACTOR POWER (CV)	150 / 220





4.1 CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE ROAD TRANSPORT

CAUTION: Use of a tractor ballasted to less than the minimum tractor weight can result in loss of control and serious injury or death.

CAUTION: Do not transport a planter in folded position with product in tanks. Do not transport a towed load (such as a fertilizer tank) unless it is empty.

IMPORTANT: Always refer to the tractor operator's manual for further safe transport information.

If a towed load is attached to the rear of the implement, add the towed load's weight to the total weight of the implement before dividing by 1.5.

Total Weight of Implement ÷ 1.5 = **Minimum Tractor Weight for Safe Transport**

IMPORTANT: Avoid machine damage. Match tractor drawbar and implement clevis. Refer to tractor operators manual for specific drawbar information.

Do not exceed static vertical load capacity of tractor drawbar. See Specifications section for vertical load and see tractor manual for drawbar limits and heavy duty supports.

5. ASSEMBLE

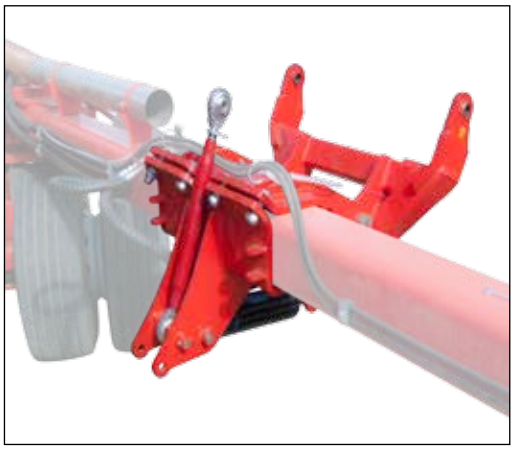
5.1 FLOTATION WHEELS

Install the outer wheels.

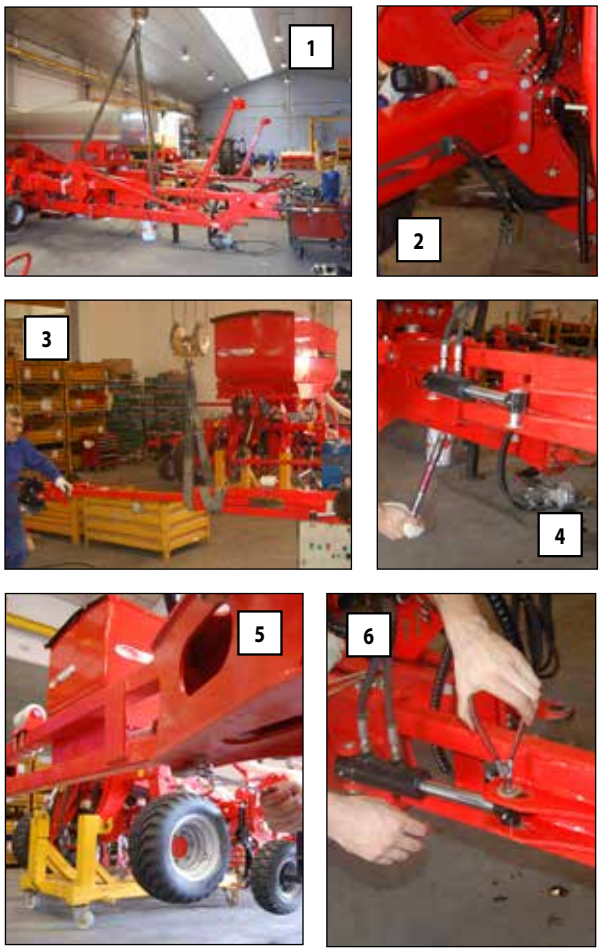
5.2 WING WHEELS

Mount a wheel at each end of the wings (6 screws).

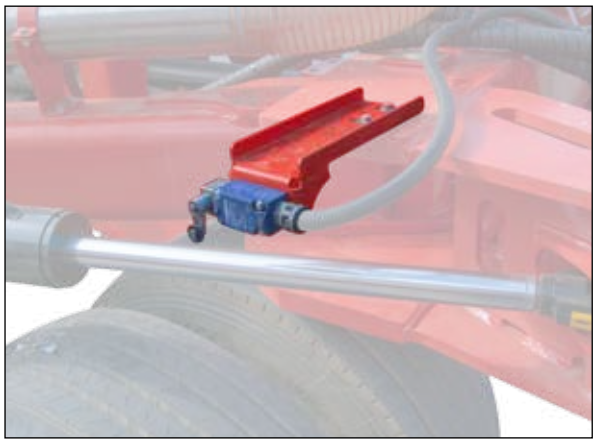
5.3 THREE POINTS



5.4 TRACK MARKERS



5.5 SENSOR



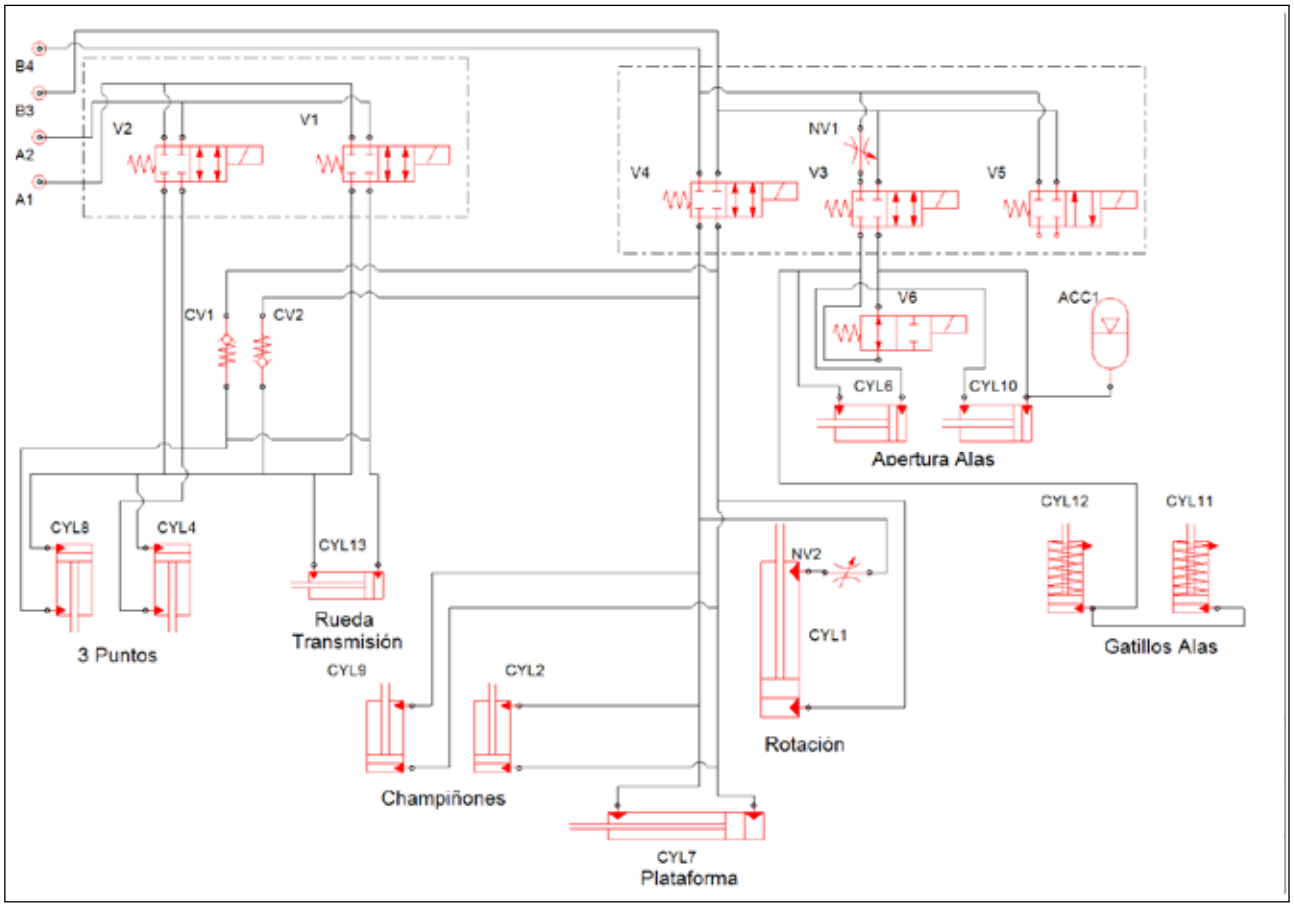
6. STARTING

Attention: this machine requires a CAT 4 tractor Hitch.

CAUTION: Use of a tractor ballasted to less than the minimum tractor weight can result in loss of control and serious injury or death.

6.1 HYDRAULIC CONNECTIONS

Red: 3 point hitches – transmission wheel
Black: wings, rockshaft, markers



6.2 UNFOLDING SEQUENCE: (THE MACHINE MUST BE ATTACHED TO THE TRACTOR)

-Connect the hydraulic hoses to the tractor
-Connect the controller to 12 v
-Plug the planter connector to the controller´s socket
-Rotate the selector switch to position #1 (wings)
-Move the SCV (black) control lever until the wings are fully open
-Rotate the selector switch to position #2 (rockshaft)
-Move the SCV (black) control lever until the rockshaft rotate 90 degrees (cylinder fully extended). The platform will extend and the distributor heads will rotate to working position automatically
-Rotate the switch selector to position #3 (3 point hitches – markers).
-SCV (red) control the 3 point hitches (raise and lower) and the SCV (black) control the markers. When the machine is working in the field (planting) the SVC (red) MUST BE in "floating" position (otherwise can produce damage on the wings and frame and irregular planting depth)

- Move the SCV (black) to "floating". The locking claws must descend to lock the wings on transport position.
- Check the both locking claws are fully low
- Move the SCV (black) lever to a neutral position. The machine is ready for transport.

On transport position the locking claws must be in the low position, preventing wings opening during transport on the road.

Stay away of the opening and closing wings area.

The platform must be clear during the folding – unfolding sequence.

Travel on the platform or over the hoppers is not allowed.

6.2 FOLDING SEQUENCE

IMPORTANT: It is recommended that product tanks are empty when machine is folded.

-Fold both markers
-Rotate the selector switch to position #2
-Move the SCV (black) control lever until the rockshaft rotates 90 degrees (cylinder fully closed. The platform and the distributor heads will close automatically
-Rotate the selector switch to position #1
-Move the SCV (black) until the wings are fully closed.

ATTENTION: the wings only can close if the rockshaft is fully rotated and the platform fully retracted.

6.3 PRESSURIZED HOPPER

IMPORTANT: It is recommended that product tanks are empty when machine is folded.

Attention: The hopper covers must be placed and leak free during the operation

Attention: Before opening the covers be sure the fan is off.

Attention: The air pressure in the hopper must be between 40-50 mbars during the operation

6.4 SOLID FERTILIZER RATE ADJUSTMENT

6.4.1 STATIC CALIBRATION

- Place the gearbox lever at middle of the scale (if this is the first calibration)
- Fill both hoppers with fertilizer.
- Open 2 of the bottom cover (one of each fertilizer meter) and place a collector bag on each one.
- Turn the drive wheel 29.5 revolutions.
- Remove the bags and weigh the content.
- Calculation of the fertilizer rate applied: (16 rows – 0.7 mts)

Fertilizer Collected (Kgs) x 35.712 = Kgs/Ha
- if the desired rate not match the results of the calibration, adjust the gearbox lever and repeat the process until the desired rate is obtained.

6.4.2 DYNAMIC CHECK METHOD

- This must be performed after static calibration process to ensure the applied rate is correct
- Remove 4 (2 on each side of the machine) rubber hose attached to the fertilizer opener and place a bag on each one.
- Run the planter 100 mts
- Remove the bags and weigh the content.
- Calculation of the fertilizer rate applied: (16 rows – 0.7mts)
Fertilizer Collected (Kgs) x 35.712 = Kgs/ha

6.5 HYDRAULICAL TRACK MARKERS

Track markers are placed at the frame's ends and they are operated hydraulically.

To FOLD and UNFOLD the track markers, pressurize the hydraulic system.

In the case that the first track marker to be unfolded is from the non-desired side, fold it and then pressurize the system again. In this way, the track marker from the correct side will be unfolded.

Track markers can be adjusted in **LENGTH** and **DISC ORIENTATION**.

NEVER STAND UNDER THE TRACK DISCS OR WITHIN THEIR OPERATIONAL AREA..

IT IS ESSENTIAL TO FOLD THE TRACK MARKERS BEFORE FOLDING THE MACHINE FOR TRANSIT.

BEFORE FOLDING OR UNFOLDING THE TRACK MARKERS, MAKE SURE NO HIGH-VOLTAGE OVERHEAD LINES HANGING AT A LOW POSITION MAY TOUCH THEM. THIS MAY HAPPEN AS RESULT OF THE ADJUSTMENTS PERFORMED TO THEM OR DUE TO THE TERRAIN'S CONDITIONS.

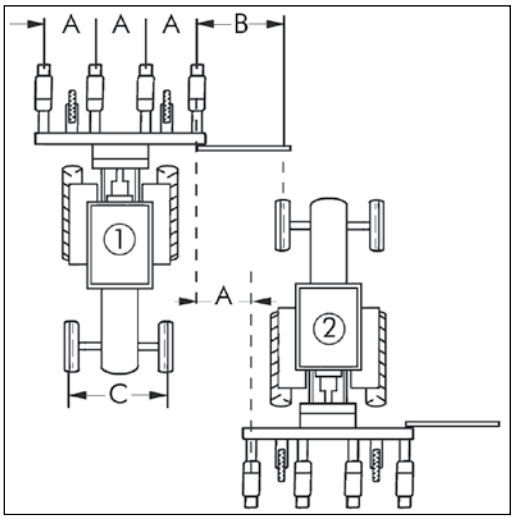
WATCH OUT WHEN FOLDING THE TRACK MARKERS. DEPENDING ON THE TYPE OF PLANTER AND THE ADJUSTMENTS PERFORMED TO THE TRACK MARKER, IT MAY INTERFERE WITH THE FERTILIZER HOPPERS. IN THIS CASE, EITHER THE LENGTH OR THE DISC ORIENTATION OF THE TRACK MARKER NEEDS TO BE ADJUSTED.

6.5.1 ADJUSTING TRACK MARKER'S LENGTH

Track marker's arms are extensible. To calculate the horizontal spacing between track discs and the last metering unit (B, figure), use following formula:

$$\mathbf{B} = \frac{\mathbf{A} \times (\mathbf{n^o\ of\ rows} + 1) - \mathbf{C}}{2}$$

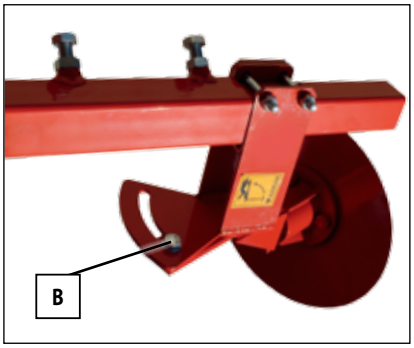
NOTA:
A= row spacing.
B= horizontal distance between track disc and the last metering unit.
C= track width of the tractor.



This adjustment allows you to keep the same row spacing A between a length with the planter (1) and its return (2).

6.5.2 ADJUSTING TRACK DISC'S ORIENTATION

Adjust the track disc's orientation by loosening the securing nut (B, Fig. 6.79) so that the track disc has the desirable impact on the ground. Tighten the nut after performing this operation.



IT IS NOT RECOMMENDED TO INCLINE THE TRACK DISCS TOO MUCH, THUS PREVENTING SERIOUS DAMAGE TO THE MACHINE.

7- MAINTENANCE

IN CASE OF MALFUNCTION, STOP THE PLANTER IMMEDIATELY AND REMOVE THE IGNITION KEY. LEAVE THE TRACTOR AND VISUALLY INSPECT AND EVALUATE THE EXTENT OF THE PROBLEM. PERFORM THE REQUIRED OPERATIONS ON THE PLANTER BEFORE RESTARTING IT.

MAINTENANCE OPERATIONS MUST BE PERFORMED IN PROPERLY EQUIPPED GARAGES BY QUALIFIED PERSONNEL.

NO REPAIRS SHOULD BE PERFORMED WITHOUT THE NECESSARY SKILLS AND KNOWLEDGE. IT IS ESSENTIAL THAT THE INSTRUCTIONS DETAILED IN THIS MANUAL ARE STRICTLY FOLLOWED. IF THESE INSTRUCTIONS ARE MISSING, PLEASE CONTACT THE PLANTER'S PROVIDER OR QUALIFIED PERSONNEL.

IN ORDER TO PERFORM MAINTENANCE OR REPAIR OPERATIONS TO THE PLANTER, IT IS ESSENTIAL TO USE PROPER **PERSONAL PROTECTIVE EQUIPMENT** (PPE): SAFETY BOOTS AND GLOVES, HEARING PROTECTION, DUST MASK AND PROTECTIVE GLASSES).

IT IS RECOMMENDED TO AVOID WEARING LOOSE CLOTHING SINCE IT MAY BECOME TANGLED WITH THE PLANTER'S MOVING PARTS.

Before performing any task on the machine, it is essential to take into account the following factors:

- Maintaining or repairing the planter should be performed on a flat and compact ground. Before starting any of these tasks, the tractor's engine must be turned off and the ignition key removed.

- The chosen device to raise the planter needs to be appropriate for the operations to be performed. Please ensure that all safety regulations are observed.

- Always use appropriate protective equipment for any task to be performed.

- In case compressed air is used to clean the planter, or an airbrush is used to paint any planter's part, you are required to wear protective glasses and mask.

- If any operation needs to be performed on a part of the machine which is at more than 1,5 metres height from the ground, check if it is possible to reach this part using the planter's access points (planter's access ladder). If not possible, use either a ladder or a platform which is in accordance with the current safety regulations.

- Prolonged and/or repetitive skin contact with fuel and lubricants is harmful. In case these products come accidentally into contact with the eyes or other sensitive parts, wash well the affected parts with clean water. In case of ingestion, contact the medical services immediately.

7.1 CHECKING FREQUENCY

The frequency of the checks indicated below is provided as a guideline. It may vary depending on machine application and use, environment, temperature, weather conditions, etc.

- BEFORE STARTING THE SOWING SEASON:

Check the general operation of the machine. Perform this check without any fertiliser inside the hopper.

Check that the plastic components of the planter are in good condition. The wear of this material due to natural ageing or to the presence of rodents causes damages to these components.

Check that the mechanical components are in good condition and not rusty.

Clean the parts of the machine which are permanently in contact with fertiliser, such as hoppers and metering boxes.

Check that the signal lamps work properly.

Check that the unions and the ducts of the hydraulic system do not show oil leaks.

- PERIODICALLY:

Before washing the planter with water, check that no fertilizer are inside the hoppers or the metering boxes. After washing the machine, turn on the fan for some minutes in order to remove the moisture from the metering units and the suction system.

Check that all the screws are in good condition, especially the ones which are in contact with the ground. Tighten every single screw and bolt.

Check that the metering boxes and the suction system do not contain any residue (such as seed or fertilizer residue, dust, etc). Residue accumulation may damage the air system.

- END OF SOWING SEASON

Wash the machine well with a lot of water, making sure that no fertilizer or other products remain inside the hoppers, metering boxes or ducts. Wash especially the parts of the planter which are in contact with chemical products.

Properly lubricate the moving parts of the planter (see section 7.2 GREASING AND LUBRICATION).

Repaint any metallic component which has lost its paint due to wear.

To store the planter properly, cover it with tarpaulin and keep it in a dry place.

Thoroughly check all components of the planter and replace the ones which are damaged or worn.

A careful maintenance of the planter ensures proper functioning and long service life of the machine.

BEFORE PERFORMING THESE OPERATIONS, THE PLANTER'S ENGINE MUST BE TURNED OFF AND THE IGNITION KEY REMOVED.

The next table shows the maintenance operations to be performed on the machine along with their (GUIDANCE) frequency:

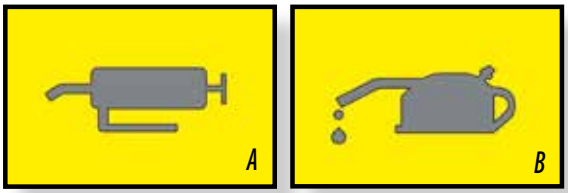
MACHINE'S PART	TASK TO BE PERFORMED	NUMBER OF HOURS			
		20	50	100	500
Machine's components	Greasing of all the components	•	•		
Drive wheels	Check of the tyre pressure			•	
Chain transmissions	Lubrication of the transmission chains		•		
	Adjusting the transmission chains' tension				•
Gearbox	Oil change	1 year			

AFTER THE FIRST 10 HOURS OF WORK, TIGHTEN THE SCREWS THAT SECURE THE METERING UNITS, THE THREE POINT LINKAGE, THE WHEELS AND THE TRACK MARKERS' SUPPORTS.

7.2 GREASING AND LUBRICATION

Every non-painted metallic component of the planter is exposed to atmospheric and weather conditions, which may oxidize them. For this reason, it is important to grease and lubricate these components.

Attached to specific parts of the planter, you will find adhesives with symbols to indicate the parts to be GREASED (A) or the points to be LUBRICATED (B).



BEFORE LUBRICATING OR GREASING, WASH THE PLANTER TO REMOVE EARTH RESIDUES ATTACHED TO THE MACHINE (see section 9.6 MACHINE CLEANING).

The following parts of the planter should be greased:

- Track markers
- Driving wheels' bushings.
- Each component of the transmission.
- Each component of the metering units.
- Each PTO shaft and plastic axle of the PTOs.

TO GREASE THESE PARTS, ALWAYS USE SOLID CALCIUM GREASE.

SOME PARTS OF THE MACHINE NEED TO BE GREASED EVERY 50 WORKING HOURS (SEE SECTION 7.1 CHECKING FREQUENCY). NOT OBSERVING THESE GREASING RULES MAY RESULT IN DAMAGE TO THE PLANTER.

7.3 SCREWS

All the securing screws which fix the components to the planter need to be checked and tightened if necessary after the first 10 hours of work. Especially check the securing screws of the metering units, the three-point frame, the wheels and the supports of the track markers.

7.4 TYRE PRESSURE

Before starting working with the planter, check that the tyre pressure is correct.

TYRE TYPE	AIR PRESSURE (bar)
385/55 R22.5	-
400/60-15.5	-

10- WARRANTY

MAQUINARIA AGRÍCOLA SOLÀ, S.L. ensures the smooth functioning of any product according sold to the technical specifications of the WARRANTY CERTIFICATE provided with each machine.
Any delivery note accompanying the goods will eventually result in a VAT invoice. If the BUYER considers the goods to be in warranty and they should not be invoiced, the problem will be analyzed and, if appropriate, your account will be credited. In order for the warranty to be valid, the WARRANTY CERTIFICATE must be returned once it has been properly filled in by the DEALERSHIP and the BUYER.

MAQUINARIA AGRÍCOLA SOLÀ, S.L. will not be held responsible for any damage caused by misuse, or by not checking the smooth functioning of the goods when either starting the machine or during the sowing season (see section 3.2).

Neither the DEALERSHIP or the BUYER or the USER will be able to claim compensation to MAQUINARIA AGRÍCOLA SOLÀ, S.L. for incidental damages such as labour costs, transport, faulty work, damages to persons or goods, harvest loss or reduced harvest, etc.

Material exchanges or returns will be paid by the buyer with the previous consent of MAQUINARIA AGRÍCOLA SOLÀ, S.L. OPTIONAL EQUIPMENT and SPARE PARTS which have surpassed three months since delivery or have been manufactured ex professo, will only be accepted as an exception. Parts eligible for warranty coverage need to be returned to the factory to be checked and eventually exchanged, They need to be returned accompanied with a note explaining the problem and containing the machine model and serial number. Warranty coverage remains subject to the decision of MAQUINARIA AGRÍCOLA SOLÀ, S.L. Any repair which has not been approved by MAQUINARIA AGRÍCOLA SOLÀ, S.L. will not be covered under WARRANTY.

11- NOTES

DATE	NOTES

DATE	NOTES

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