TRI-3014
ED-3014

Mechanical seeder

STARTING MANUAL

MAINTENANCE AND DOSAGE

SOLÀ seed drills 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. They 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 - March 2021
Ref.: CN-811102/GB
Created by: MAQUINARIA AGRÍCOLA SOLÀ S.L.

TABLE OF CONTENTS

1. INTRODUCTION

Before any use of the machine it is very important to read the instruccions 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. 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 and integrating part of the product, and ust be kept in a safe place for consultation during the whole life span of the machine.

SOLÀ will not asume any responsibility 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 and Spare parts list.

MAQUINARIA AGRÍCOLA SOLÀ RESERVES THE RIGHT TO MODIFY ILLUSTRATIONS, TECHNICAL DATA AND TECHNICAL SPECIFICATIONS AT ITS DISCRETION

You will find, in this operating manual, three types of safety and danger symbol:

TO FACILITATE OPERATION WITH THE SEED DRILL.

TO AVOID DAMAGES ON THE MACHINE OR IN THE OPTIONAL EQUIPMENTS.

THIS SYMBOL WARNS OF THE RISK OF INJURY.

2. TECHNICAL SPECIFICATIONS

2.1 SEEDER

TYPE OF MACHINE ROWS NUMBER		ROW SPACING	WORKING WIDTH	HOPPER CAPACITY LITERS	WEIGHT (KG)	DIMENSIONS WIDTH-LENGTH-HEIGTH	TRACTOR POWER	TYRES
TINE COULTERS	**600/48**	12,5 cm	6 m	1712		6,07 x 2,66 x 1,45	180 hp	10.0/75-15,3
DISCS	**600/48**	12,5 cm	6 m	1712		6,07 x 3,00 x 1,45	180 hp	10.0/75-15,3

2.2 COMBINED SEEDER

TYPE OF MACHINE ROWS NUMBER		ROW SPACING	WORKING WIDTH	HOPPER CAPACITY LITERS SEED	FERTILIZER	WEIGTH (KG)	DIMENSIONS WIDTH-LENGTH-HEIGTH	TRACTOR POWER	TYRES
TINE COULTERS	**600/48**	12,5 cm	6 m	828	884		6,07 x 2,66 x 1,45	180 hp	10.0/75-15,3
DISCS	**600/48**	12,5 cm	6 m	828	884	1882	6,07 x 3,00 x 1,45	180 hp	10.0/75-15,3

3. SAFETY INSTRUCTIONS

3.1 SAFETY SIGNS

On the machine you will find the following symbols:

PLEASE, READ THE SAFETY INSTRUCTIONS CONTAINED IN THIS OPERATION MANUAL WITH CARE AND ALSO OBSERVE ALL WARNING SIGNS

STAY AWAY OF THE TRACTORBACK PART DURING THE COUPLING OPERATION, DURING THE MANOEUVRING.
DANGER OF SERIOUS LESIONS

STOP THE TRACTOR ENGINE AND AVOID ITS START DURING THE MAINTENANCE OR REPAIRING WORKS IN THE SEED DRILL. CONSULT OPERATING MANUAL.

DO NOT PLACE UNDERTHE SOWING EQUIPMENT OR UNDER SWINGING AREAS.
DANGER OF SERIOUS LESIONS.

DO NOT RIDE ON THE SEED DRILL STAIRS WHEN THE MACHINE IS WORKING.

CLOSE THE HOPPER COVER WITH CARE. DO NOT PLACE THE HAND INTO THE HOPPER TO AVOID LESIONS.

SUPERVISE HYDRAULIC PIPES. CONSULT OPERATING MANUAL FOR SERVICE PROCEDURES. DANGER OF SERIOUS LESIONS.

DO NOT PLACE UNDER THE TRACK MARKERS.
DANGER OF S E R I O U S LESIONS.

HANDLING POINT FOR LIFTING..

DO NOT PLACE THE HAND INTO THE HOPPER WHILE THE AGITATOR SHAFT IS TURNING.
DANGER OF LESIONS.

3.2 USE

- Seed drills TRI-3014 and ED-3014 have been manufactured for the agricultural works, specially for cereals sowing and the other grain sowing.
- SOLÀ can not be held liable for any consequential damage resulting from incorrect use, metering or distribution.
- All relevant accident prevention, as well as other generally acknowledged safety and road traffic regulations, must be observed.
- All the machine modifications realised by the user, automatically exempt SOLÀ from its/his liability in respect on ensuing damages.

3.3 SAFETY ARRANGEMENTS

BEFORE TO START THE MACHINE IT IS VERY IMPORTANT TO READ THE OPERATION SAFETY AND ROAD SAFETY.

ROAD TRAFFIC REGULATIONS AND SIGNS MUST BE OBSERVED.

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 DURING COUPLING AND UNCOUPLING OPERATION.

DURING THE SEED DOSAGE TEST, PAY ATTENTION TO DANGEROUS POINTS, SPECIALLY THE AGITATOR TEETH INSIDE THE HOPPER AND THE WHEEL SCRAPERS.

THE FAST-COUPLING CLAMPS MUST BE UNBLOCKED DURING NORMAL OPERATION.
THEY MUST BE BLOCKED ONLY FOR UNCOUPLING.

NEVER LEAVE THE DRIVER SEAT DURING MACHINE OPERATION.

DO NOT PLACE STRANGE ELEMENTS INTO THE HOPPER.

BEFORE WORKING ON HYDRAULIC SYSTEM, LEAVES THE MACHINES ON THE FLOOR, ELIMINATE CIRCUIT PRESSURE AND STOP THE ENGINE.

THE HYDRAULIC SYSTEM GENERATES EXTREMELY HIGH PRESSURE. ALL PIPING, HOSES AND CONNECTIONS MUST THEREFORE BE CHECKED REGULARLY FOR LEAKAGE AND VISIBLE EXTERNAL DAMAGE. USEFUL LIFE FOR THESE ELEMENTS IS NOT MORE THAN SIX YEARS. YOU MUST CHANGE THEM AFTER THIS TIME.

WHEN THE SEED DRILL IS RAISED, THE TRACTOR FRONT AXLE DISCHARGES. VERIFY THAT THE CHARGE IS ENOUGH TO AVOID LODGING DANGER. IN THIS SITUATION, VERIFY DIRECTION AND BRAKING CAPACITY.

DURING THE TRANSPORT WITH THE SEED DRILL RAISED, BLOCK THE DESCENT CONTROL. BEFORE DESCENDING OF THE TRACTOR, PLACE THE MACHINE ON THE GROUND AND REMOVE STARTING KEYS.

BE EXTREMELY CAREFUL WHEN WORKING WITH THE MACHINE IN RAISED POSITION. USE SUPPORT ELEMENTS TO AVOID A POSSIBLE DESCENT OF THE MACHINE.

3.4 LOADING AND UNLOADING

It is necessary to load and to unload the truck, if it is possible, with a bridge crane. The fastening points: coupling and harrow-scraper support.

Pay attention with the operations. They must be done by responsible and experienced people.

To avoid serious damage, do not stay under the machine during the operation.

4. SOWING ESSENTIAL CONCEPTS

4.1 SOIL

TO HAVE THE BETTER QUALITY OF SOWING, IT IS VERY IMPORTANT THE SOIL CONDITION. OVER BIG PATCH OR VARIABLE FURROW IT IS NOT POSSIBLE TO DO A GOOD WORK. ALTHOUG SOLÀ MACHINES ARE ABLE TO TAKE HARD EFFORTS IN EXTREME CONDITIONS, SOWING WILL HAVE NOT GOOD QUALITY IF THE SOWING LAND HAS NOT GOOD CONDITIONS.

4.2 SEED

IT IS VERY IMPORTANT USE QUALITY AND CLEAN SEED. WHEN SOWING BARLEY, USE TRIMMED ONE.

4.3 DEPTH

RECOMMENDED SEEDING DEPTH CHANGES DEPENDING ON THE TYPE OF CROP, THEREFORE, IT IS RECOMMENDED THE PROFESSIONAL ADVICE TO THE FARMER ON THIS MATTER.

Sowing depth has influence in the birth and vigour of the plant and consequently in its resistence 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 does not 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.

IMPORTANT: THE SOWING DEPTH ON TINE COULTERS SEED DRILL ISN'T UNIFORM, IT DEPENDS ON THE CONDITIONS OF HOMOGENIZATION CONDITIONS AND FIELD CHARACTERISTICS.

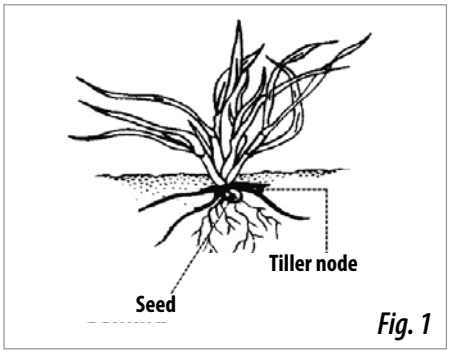

Fig. 1

Sowing depth 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.

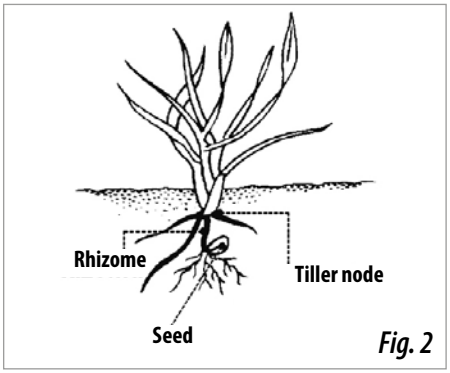

Fig. 2

Sowing depth 5 to 6 cm

- Thin stem, rhizome exposed to freezing.
- Delayed and poor sprouting, one shoot (sometimes none) not many blades, 3 or 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.

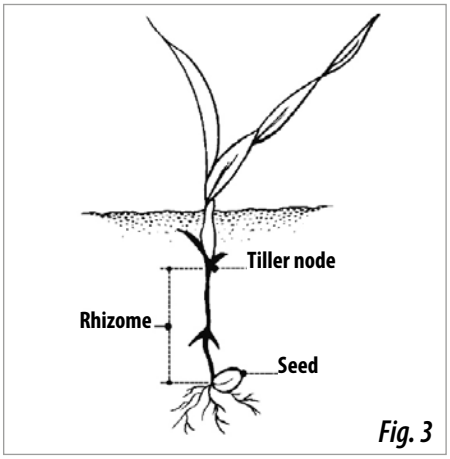

Fig. 3

Sowing depth 8 to 10 cm

- Very thin stem. No sprouting and a single blade.
- The grain reserves become depleted by forming a large rhizome 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.

WARNING

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.

IN ALL SOLÁ MACHINES, THE SEED DISTRIBUTOR SPEED VARIATOR IS ACTIVATE BY THE RIGHT WHEEL. BENDS MUST BE DONE COUNTERCLOCKWISE, AS TURNING AROUND THE DRIVE WHEEL WILL CAUSE A LOWER DISTRIBUTION OF SEED.

ONCE THE MACHINE IS WORKING, SEED WILL NOT BE DELIVERED IN THE FIRST GROOVE METER. ON THE CONTRARY, WHEN THE MACHINE STOPS, THE REMAINING GRAIN INSIDE THE PIPES WILL SLIDE DOWN AND PILE UP.

WORK ALWAYS AT A REGULAR SPEED. HARD BRAKES AND SUDDEN ACCELERATIONS RESULT IN IRREGULAR SEED DISTRIBUTION.

4.4 SEED DOSE ADJUSTMENT

With current use of high quality certificated seed, it is 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.

MAQUINARIA AGRÍCOLA SOLÀ, S.L., THINKS THAT IS RECOMMENDABLE TO SEED ADVICE ABOUT RECOMMENDED DOSIFICATION IN SOME TECHNICAL SOWING CENTER.

THE SEED DOSE MUST BE ADJUSTED TO EACH SOIL DEPENDING ON ITS TEXTURE, FERTILIZATION LEVEL, DAMPNESS AN SOWING TIME, GRAIN QUALITY, GERMINATIVE VALUE, ETC.

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 is equivalent to multiply by 1,43 and 1,25 respectively the number of grains needed.

Find as follows a method to determine the kgs per hectare to sow starting from plants per square meter we want obtain.

1) Introduce «grain counter» in the seed bag. Then, verify that in each hole we have only one seed (100 grains in total). Repeat the operation 10 times (you will obtain 1000 grains).

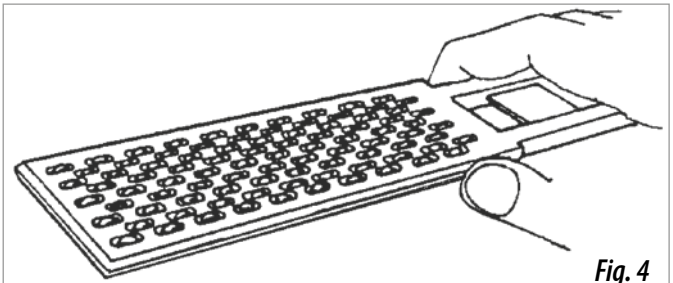

Fig. 4

2) To weight the 1000 grains in the precision weighing machine. The weight will be the OPERATIVE WEIGHT.

3) When we know the grains per square meter to sow, the kgs per hectare to adjust in the dosage control are:

KILOGRAMS PER HECTARE =
(grains per m^2 x OPERATIVE WEIGHT) / 100

5. STARTING OPERATION

5.1 COUPLING

Seed drills **TRI-3014** AND **ED-3014** is supplied with a three-point linkage of category 3.

MAKE SURE THAT NO PERSON OR OBJECT IS EVER BETWEEN THE SEED DRILL AND THE TRACTOR WHEN COUPLING BOTH MACHINES.

Place the fast-locking balls in the two lower bolts.
Next, couple the seed drill using the three-point linkage.

5.2 DISPENSER MECHANISM

Solà dispenser roller can be adjusted with two working positions:
- Narrow cog with small teeth for small seed (fig. 6).
- Wide cog with large alternated teeth for normal and big seed (figs. 7 and 8).

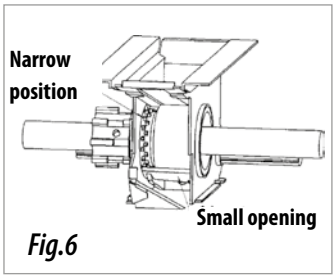

Fig.6

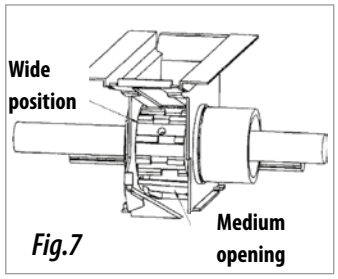

Fig.7

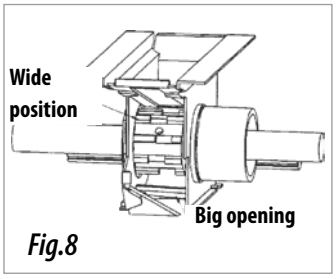

Fig.8

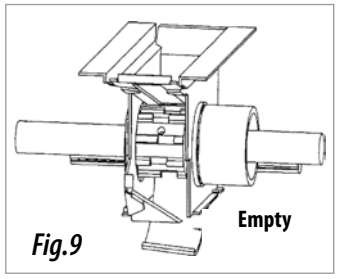

Fig.9

The seed mobile bottom has two objectives:
- To adjust the lower seed dispenser opening according to the grain size (figs. 6, 7 and 8).
- Open the distributor system to empty the hopper (fig. 9).

WHEN SHIFTING THE SEED DISPENSER ROLLER BETWEEN NARROW AND WIDE POSITIONS, MAKE SURE THE ROLLER IS EMPTY.

Once the seed dispenser roller position (wide or narrow) is decided and the moble bottom adjusted, the seed flow depends only on the rollers turning speed.
The seed speed variator accomplishes this mission, by allowing to deliver from 0 to 600 kg/ha, with rigorous precisition.

5.3 SEED DOSAGE

Verify that the seed dispenser trapdoors are opened and allow the seed flow. **Before filling the hopper, attach the agitator to the seed speed variator axle.** Make sure that there are no strange bodies in the hopper.

Place the position lever of the dispensers:

A. RIGHT, WIDE COG FOR WHEAT, BARLEY, ETC. (FIG. 10)

B. CENTRE, MEDIUM COG FOR SUNFLOWER, PEAS, ETC. (FIG. 10)

C. LEFT, NARROW COG FOR LUCERNE, RAPE, ETC. (FIG. 10)

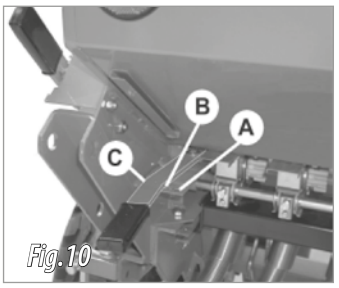

Fig.10

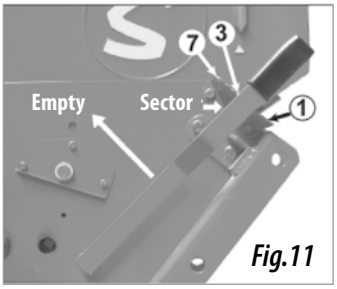

Fig.11

Place the mobile bottom lever (on the left side of the hopper) on the sector of 7 positions:

Nº 1, FOR SMALL SEED (FIG. 11)
Nº 3, FOR WHEAT AND BARLEY (FIG. 11)
Nº 5, FOR BIG SEED

To empty the hopper, place the plate under dispensers and take the lever to the front further on number 7. (fig. 11).

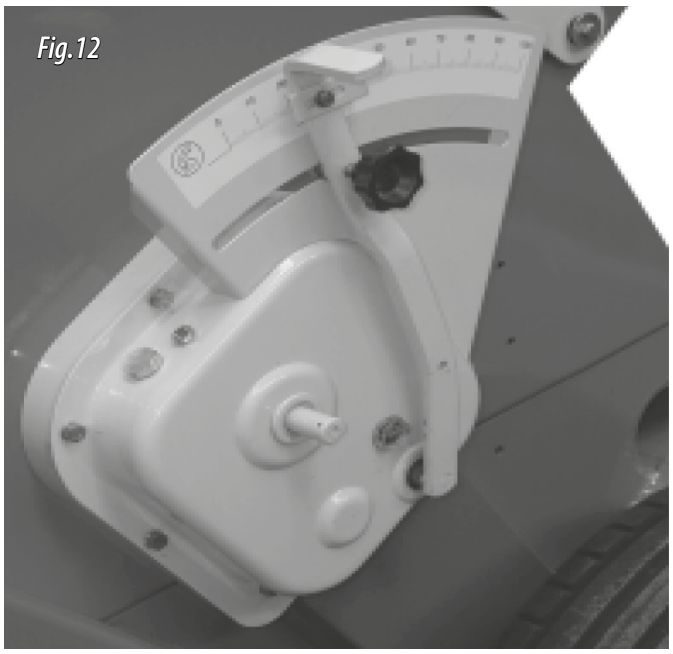
Fig.12

Finally, select the seed speed variator , place the lever on the sector from 0 to 100 and fix again on the number selected (fig.12) . See the tables (pgs. 18-19).

5.4 SEED CONTROL

Once the dispensers position is correct, the mobile bottom opening and the variator lever, it is very important and necessaty to test the seed dose.
FIRST: slide the distribution bar (1, fig. 13) along its rails by releasing the clamps (2, fig. 13) just in the correct position in order to place the plate.

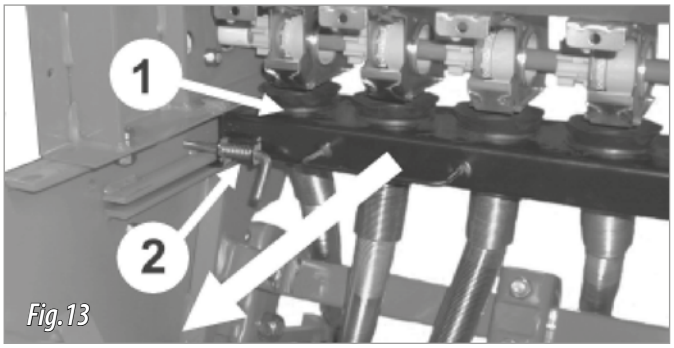

Fig.13

SECOND: slide the plate (3, fig. 14) from the transport position (4, fig. 14) under the dispensers. Machine TRI-294/R-ESP does not fitted with the plate. In this case you must use a plastic film under the dispensers to collect the seed.

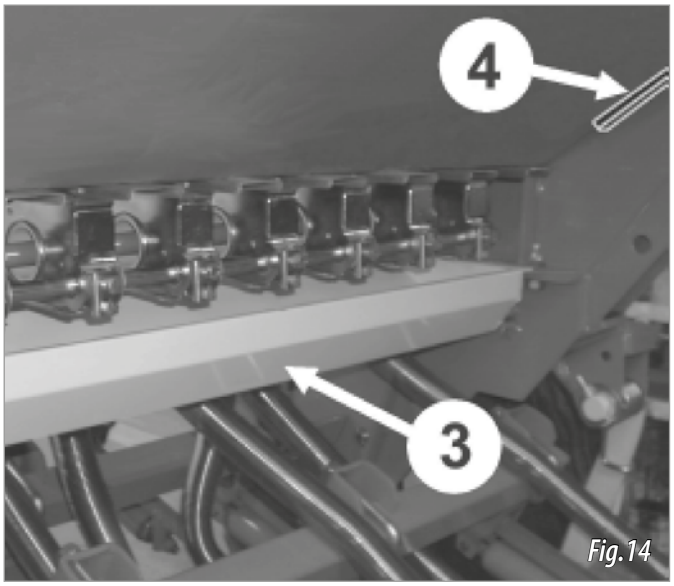

Fig.14

THIRD: place the shaft lever (1, fig. 15) in its place (2, fig. 15) on the right wheel and give some clockwise turns to the driving wheels, until some seed is delivered. Collect up the seed and return it to the hopper. The machine is ready for the real test. If your machine is TRI-294/R-ESP type, you will have to turn manually.

MACHINE TYPE	WHEELS 10.0/75-15,3
600	18,3 turns

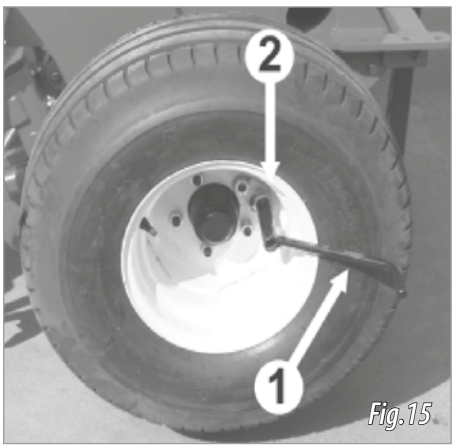

Fig.15

Give the turns indicated in the table above, aproximately on turn per second. The number of turns may vary depending on the soil conditions, the wheel manufacturer or the tyre pressure.
It is very important to do a land test as you have in the 5.5 part of this booklet.

After, collect and weight up the delivered seed in the plate or in the plastic film. Multiplying the result by 40 we obtain the kgs per hectare that the machine will distribute.

To realise these operations, it is very important that the machine is coupled to the tractor and slightly lifted (the wheels must turn freely), and it is also recommended to fill only half-hopper in order to make possible the wheel turning.

If the seed has an excess of preservation powder it may result in a flow decrease. So, it is recommendable to do a second dose test after having sow three or four hoppers.

BE CAREFUL WITH THE WHEEL.
YOU COULD DAMAGE WITH THE WHEEL SCRAPER.

5.5 LAND TEST

If it seems that there are significant differences between the dose test and the actual dispensed dose, due to an irregular or soft terrain, a field test can be performed.

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

MACHINE TYPE	DISTANCE (M)
600	41,7

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

With theses operations we will obtain the turns number for the seed test. If we do the test with this turn number, we are going to obtain the kgs per hectare delivered by the seed drill.

5.6 COMBINED DISTRIBUTION

Combined dispensers are one part by stainles steel and another part in Delrin.

Seed distribution roller is the same than the seed drill dispenser (see 5.2) and the fertilizer dispenser has constant step, fitted on hexagonal axle, to make easy to dismantle, without tools.

The fertilizer mobile bottom its a detachable stainless steel cover, this allows fertilizer roller cleaning (fig. 16).

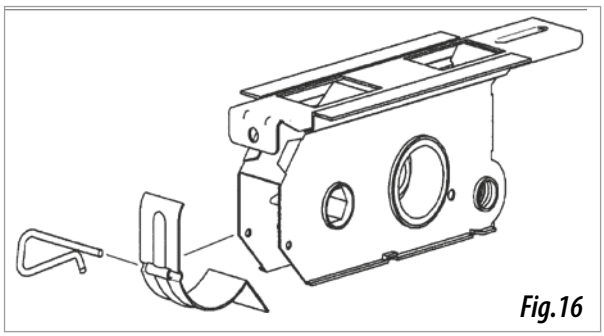

Fig.16

5.7 COMBINED HOPPERS

Combined hopper has two compartments: back compartment for seed (1, fig. 17) and the front compartment for fertilizer (2, fig. 17). The fertilizer compartment has a mesh cover (3, fig. 17) in order to avoid strange bodies, like stones, damaging the dosage mechanism.

Each compartment is fitted with its own flow control device.

The fertilizer compartment has a folding device (4, fig. 17) to avoid the fertilizer overflowing between the hopper and the cover.

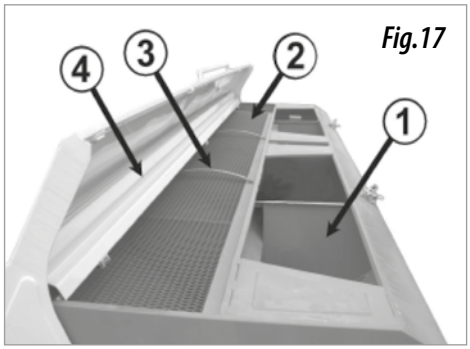

Fig.17

5.8 COMBINED DOSAGE

On the combined machines, dosage and seed control is the same to the seed drills.

The fertilizer dosage has to be done by means of the fertilizer variator placed on the left side of the machine (fig. 18), positioning the lever on the graded scale from 0 to 50 and fixing it on the number selected in the dosage tables (page 42).

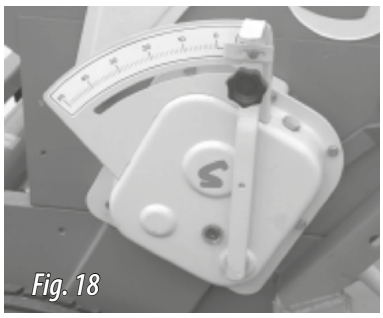

Fig. 18

These tables are for guidance only. The fertilizer density can vary depending on manufacture process. So, we recomend to carry out a fertilizer dose test likewise that of the seed:

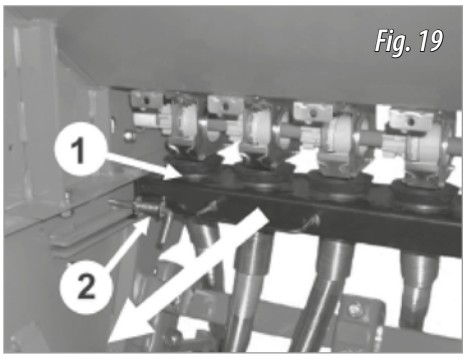

Fig. 19

FIRST: slide the distribution bar (1, fig. 19) along its rails releasing the clamps (2, fig. 19), in the working position in order to place the plate.

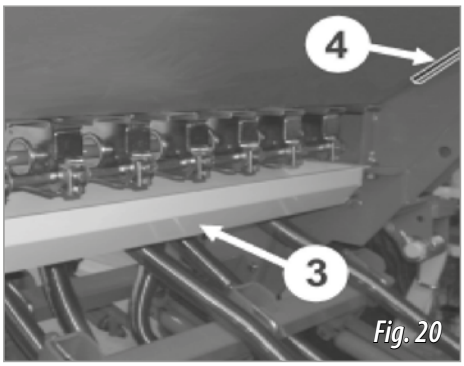

Fig. 20

SECOND: slide the plate (3, fig. 20) from the transport position (4, fig. 20) and place it under the dispensers.

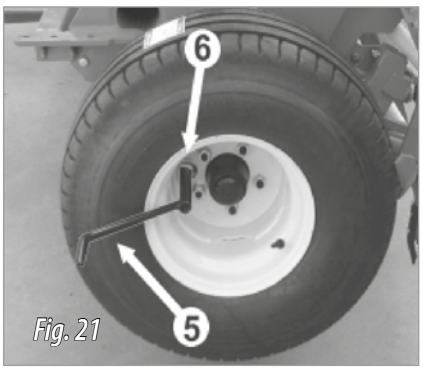

Fig. 21

THIRD: place the lever (5, fig. 21) in its place (6, fig. 21) on the left wheels and five some clockwise turns to the driving wheel, until some seed is delivered. Collect up the fertilizer and return it to the hopper and and give the turns as follows:

MACHINE TYPE	WHEELS 10.0/75-15,3
600	18,3 turns

The fertilizer collected, multiplied by 40, are the fertilizer kgs per hectare that the machine will distribute with the lever in the sector choosed. It is very important to do a precision test with the fertilizer, to verify the fiability level of the table. (pgs. 20).

BEWARE OF GETTING INJURIES FROM THE SCRAPER WHEN TURNING THE WHEEL.

OPTIONALLY, COMBINED MACHINES CAN BE DELIVERED WITH ONE OR TWO SEED AND FERTILIZER TUBES.

IN THE DOUBLE TUBE OPTION AND WITH WET WEATHER, IT IS VERY IMPORTANT TO CLEAN DE FERTILIZER COMPARTMENT OF THE NOZZLE, IN ORDER TO AVOID THE BLOCKAGE DANGER.

IT IS IMPORTANT TO CLEAN WITH PLENTY OF WATER NOZZLES, PIPES AND COULTERS FOR PREVENTING RUST.

5.9.2 DISCS

Disc coulters:
The pressure on the soil can be adjusted using three spindles, one for each folding part and another for the centre of the machine.
Turn the spindle clockwise to increase the sowing depth.
Turn the spindle anticlockwise to decrease the sowing depth.
There is an optional equipment which consists of a wheel to adjust the sowing depth.

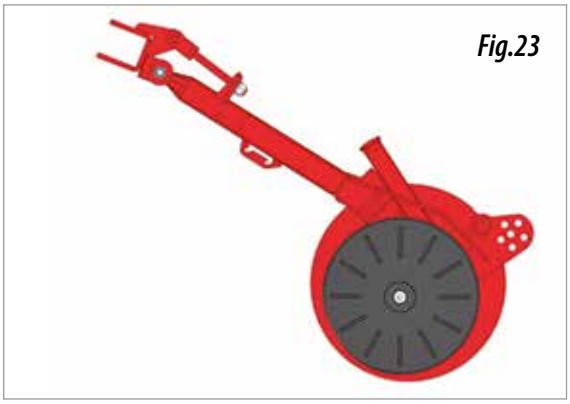
Fig.23

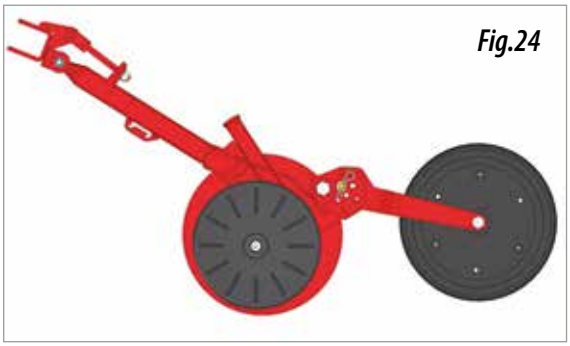
Fig.24

5.9 ARMS ADJUSTMENT

5.9.1 TINE COULTER

Fixed tine coulters:

These tine coulters have a non-adjustable depth, but their pressure can be adjusted by using a nut placed in the lower part of the spring (A, Fig. 22). Sowing depth will be determined by the adjustable central ratchets.

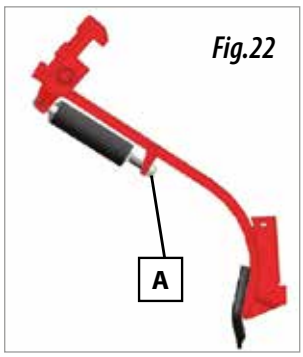

Fig.22

5.10 LEVELING AND DEPTH CONTROL

We can adjust the arms depth by a central bolt (1, fig. 25). Before, we inform you about the way to adjust the arms.

The machine has to work with the hopper in a flat position. The oscillating arrow has to coincide with the mark (2, fig. 25). We can adjust the position with the tractor hydraulic elevator.

Fig. 25

5.11 WHEEL SCRAPERS

We can adjust the scrapers by a bolt placed in the superior part of the arm.

Some times, when the machine is lifted to the tractor, the wheels are turning because of its fitting with bearings, and the seed goes on falling.

To avoid this, we can adjust the scraper bolt in such a way that touch lightly the wheel. This small brake is enough to avoid the wheels turning.

BLOCKING: in wet and clayei land it can be interesting to block the scrapers, blocking the spring joint.
We can place a bolt in the borer coincidence of the scrapers and its support.

5.12HARROW WITH FLEXIBLE TINES

The seed drill is supplied with a parallelogramic spring harrow. The springs are double-toothed (3, fig.26) in order to cover the furrow with the taken out soil.

Adjusting the upper bolts of both arms, the working pressure is (1, fig. 26) increased or decreased. Adjusting the lower bolts (2, fig.26), modifies working depth.

The parallelogramic articulation achieves and excellent adaptation of the double-toothed springs to the terrain unevennes, vertically and horizontally.

Always you must order original SOLA tines, they have had an strict quality control.

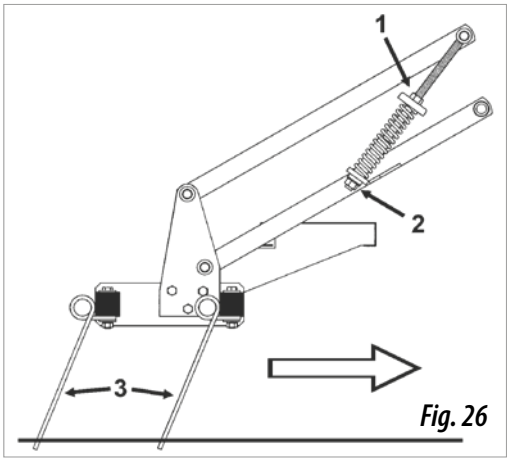

Fig. 26

IT IS FORBIDDEN TO RIDE ON THE HARROW WHEN THE MACHINE IS WORKING.

6. OPTIONAL EQUIPMENT

6.1 TRACK ERASERS

Track erasers are the best and effective otion to erase the tractor tracks. We can adjust the four arms in height and length depending of vehicle width.

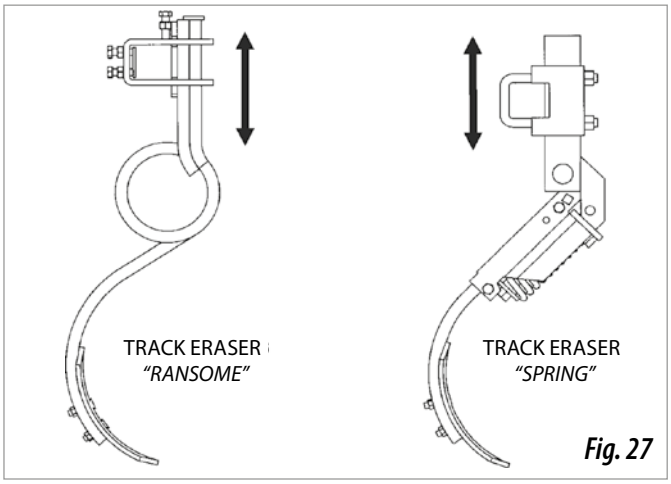

Fig. 27

6.2 HYDRAULIC DISC MARKERS

Place the markers by three bolts on the platen placed in the machine lateral. The working cylinder must be connect to a double effect device in order to control the arms position. When one arm is in vertical position, the other is in working position.

The cylinders have a throttle inside in order to slow down the track markers lift. Verify, before to working, that the track marker goes fine.

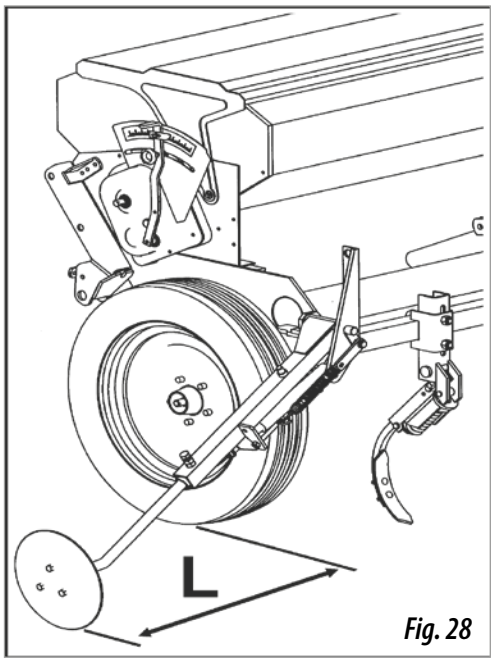

Fig. 28

Track markers arms are extensible in order to adjust them and the disc can be adjusted in order to obtain the correct position.
For the hydraulic action, we can obtain a supplementary springs in order to adjust the disc pressure on the land.
To calculate the distance between the disc and the wheel exterior part (L, fig. 28) we can apply the following formula:

$$L = \text{seed drill working width} - \frac{\text{front line tractor width} + \text{machine total width}}{2}$$

PRESSURE OIL CAN BE PENETRATE IN THE SKIN. DANGER OF SERIOUS DAMAGES. KEEP THE TUBES, PIPES, IN GOOD CONDITIONS.

NEVER PLACE IN THE FOLDING RACE OF THE MARKERS.

To circulate with the machine by the road, it is very important circulate with the markers in vertical position, fixed with the clamp to avoid their descent during the transport (fig. 29).

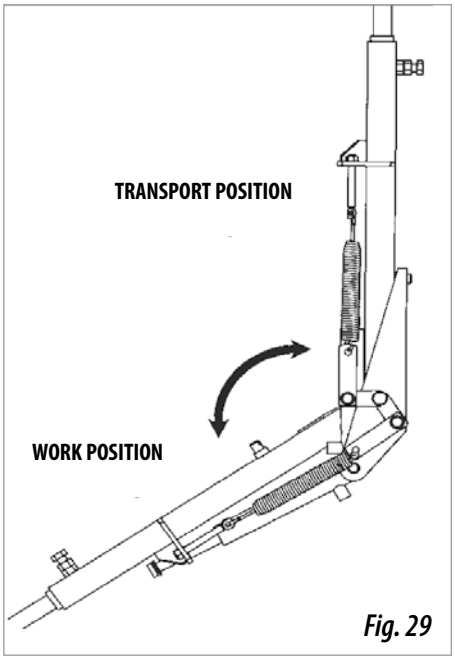

Fig. 29

PAY ATTENTION WITH HYDRAULIC TUBES.

IT IS NOT CONVENIENT TO EXCEED WITH THE SPRING PRESSURE AND VERIFY THE DISC POSITION TO AVOIDDAMAGES.

6.3 VARIATOR HYDRAULIC CONTROL

Both variators can be fitted with hydraulic controls for the distance work.

The control is fitted with a simple effect hydraulic cylinder with return spring, that works the variator lever on the positions «closed» (circuit with pressure) and «sowing» (circuit without pressure). This one is the seed or fertilizer dose that we have selected placing a stop (5, fig. 30) in the scale.

The cylinder (1, fig. 30) is fitted in the variator lever (2, fig. 30) by a bolt (3, fig. 30) and in the side of the machine with a support (4, fig. 30). The cylinder goes with a small belt to connect to a tractor pressure exit of 1/2''.

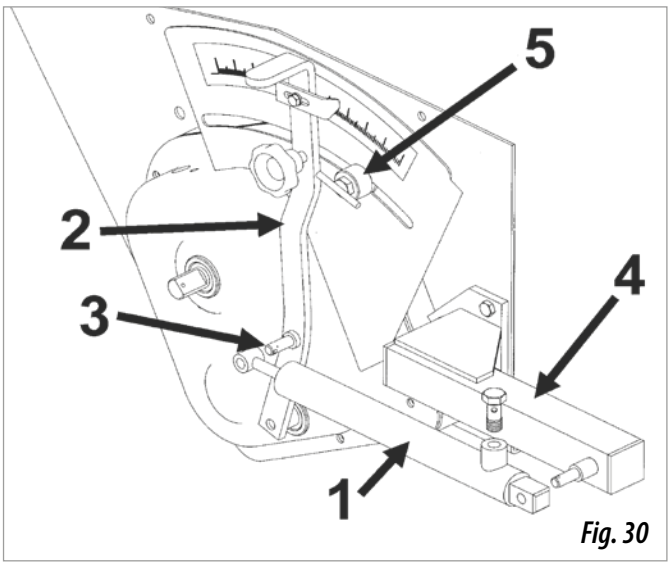

Fig. 30

PRESSURE OIL CAN PENETRATE IN THE SKIN AND TO CAUSE DANGEROUS DAMAGES. PAY ATTENTION WITH TUBES AND PIPES.

7. MAINTENANCE

7.1 GREASING

Grease regularly the following parts: Wheel axles, removing the pressure tap. Calcic dense grease (1, fig 31).
Wide-narrow switching roller. Calcic dense grease. (2, fig. 32)

Fig. 31

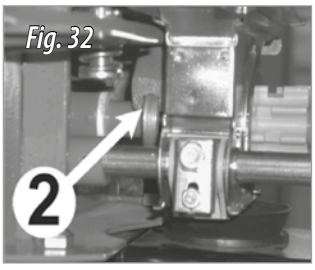

Fig. 32

Arms pressure central spindle. Calcic dense grease (3, fig. 33).

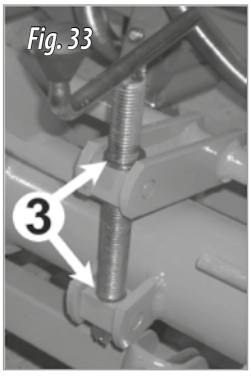

Fig. 33

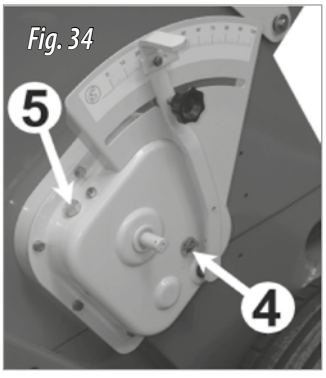

Fig. 34

Verify variator oil level through the spyhole (4, fig. 34) and if necessary remove the plug and refill with SAE 30 oil (5, fig. 34)

DO NOT GREASE THE DISPENSERS.

7.2 TYRE PRESSURE

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

Tyre 10.0/75-15,3 12 PR --- 6,1 kg/cm^2

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. 35), is supplied with the machine.

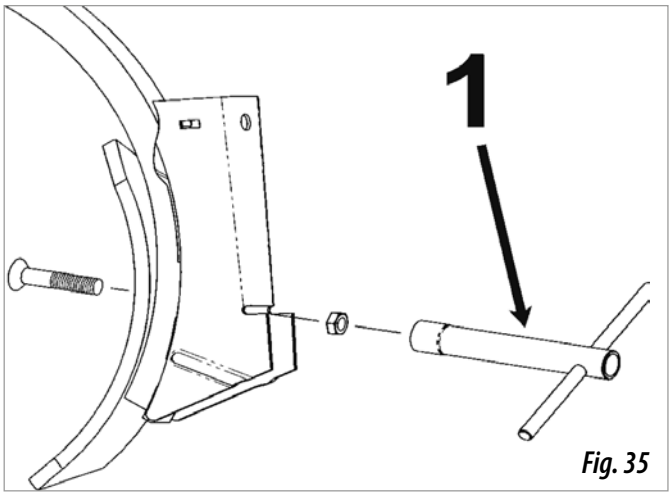

Fig. 35

7.4 ANTIOXIDE CONTROL (COMBINED MACHINE)

Once the sowing season is finished, antioxide maintenance must be carried out as follows:

a) Dismantle the pipes, the nozzles and dispenser stainless-steel covers. Clean them thoroughly.

b) Wash with water jet the whole machine, specially inside the hopper and the dispensers (with the covers removed).Turn the left wheel so that the fertilizer rollers can be completly washed.

c) Give a coat of paint to those parts with oxidation signs, specially those made of metal sheet.

d) Verify the general greasing.

7.5 PROBLEMS SOLUTION

Sometimes and working with the machine, you can have some problems. Find as follows the problems more usual problems.

Problems with distribution system:

- Verify there are not strange elements into the distributors.
- Verify the distributors exit trap-doors. Trap-doors must be totally open.
- Verify the trap-doors are in the correct position.
- Verify the distribution rollers. They can be damaged.
- Avoid to work in very closed circles: it could produce a bad seed
- distribution.

The dose is not correct (it is inferior).

- Please, follow the booklet instructions to adjust the dose.
- Pay attention with the pressure wheels, wheel sliding on the land, etc.
- If the driving wheel do not touch the soil, verify the tractor hydraulic arms are well adjusted.
- Verify the conection fastener between the variator and the distributor axle.
- Wheel scrapers can brake the drive wheel.
- Verify the transmission device: bushing tooth, chain and variator pinion.
- After doing all the checking and the problem exists, please ask your SOLÀ dealer. Do not try to repair the variator.

8. DOSAGE TABLES

THE QUANTITIES YOU HAVE FOUND IN THE TABLES ARE FOR GUIDANCE ONLY. THE FLOW CAN VARY DUE TO PRESERVATION POWDER, SEED SIZE, DENSITY AND HUMIDITY.

TO DO A PRECISION SOWING, PLEASE FOLLOW THE PROCESS DESCRIBED IN SECTIONS 5.4 AND 5.5 YOU CAN FOUND IN THIS MANUAL.

AS A GENERAL RULE, SMALL GRAIN NEEDS LESS OPENING THAN THE BIG, ROUND GRAIN NEEDS LESS OPENING THAN LENGTH AND LIGHT GRAIN NEEDS MORE OPENING THAN THE HEAVY.

8.1 SEED DOSAGE TABLE (KG/HA) MACHINE 600/48

SEEDS		WHEAT	BARLEY	TRITICALE	PEAS	BEANS	RAPE	SAINFOIN	VESCE	RAY-GRAS
DISPENSER POSITION		WIDE	WIDE	WIDE	WIDE	WIDE	NARROW	WIDE	WIDE	NARROW
ADJUST LEVER	14					75,1	3,6	22,6	71,0	
	16					90,5	4,9	27,8	86,4	
	18					109	5,8	31,9	104	
	20	84,3	65,8	62,7	42,2	130	6,8	37,0	121	
	22	93,6	75,1	69,9	48,3	144	8,1	41,1	139	
	24	103	82,3	77,1	51,4	159	9,1	47,3	153	
	26	112	90,5	83,3	57,6	180	10,2	51,4	169	9,7
	28	121	99	91,5	62,7	200	10,4	57,6	190	10,6
	30	132	110	89,5	68,9	216	13,2	63,8	210	11,8
	32	142	118	110	72,0	233	14,4	72,0	220	13,1
	34	151	126	119	77,1	251	15,9	47,3	243	14,3
	36	161	136	131	82,3	268	17,5	88,4		15,4
	38	170	143	139	86,4		19,2	94,6		17,0
	40	178	150	147	90,5		21,3	99		17,5
	45	197	167	162	97		23,2	110		19,0
	50	219	185	178	103		26,2			20,6
	55	240	204	194	109					22,6
	60	261	223	213	117					24,7
	65	284	240	230	144					29,8
	70	305	258	247	155					33,9
	75	327	278	264	165					43,2
	80	349	294	282						
	85	374	312	299						
	90	402	327	316						
	95	415	346	333						
	100	432	362	352						
ARMS DISTANCE (CM)		**12**	**12**	**12**	**24**	**12**	**24**	**12**	**12**	**12**
MOBILE BOTTOM LEVER POSITION		**3**	**3**	**3**	**5**	**4**	**1**	**3**	**2**	**1**
1000 GRAINS OPERATIVE WEIGHT		**40 GR**	**46 GR**	**30 GR**	**293 GR**	**530 GR**	**-**	**19 GR**	**44 GR**	**-**

SEEDS		LUCERNE	SPINACH	LINEN	OATS
DISPENSER POSITION		NARROW	NARROW	WIDE	WIDE
ADJUST LEVER	14	13,0	5,5	36,0	22,1
	16	15,7	6,6	43,2	26,1
	18	19,0	8,3	50,4	29,8
	20	21,3	9,9	57,6	33,9
	22	24,5	11,6	64,8	38,1
	24	26,7	13,2	72,0	42,2
	26	29,5	14,6	79,2	46,3
	28	32,9	16,4	86,4	50,4
	30	35,8	18,0	93,6	54,1
	32	38,8	19,5	101	58,0
	34	42,2	21,2	108	61,7
	36	45,3	22,6	115	65,8
	38	49,4	23,7	130	69,9
	40	54,5	28,8	148	74,0
	45	60,7	31,9	166	84,3
	50	65,8	37,0	184	94,0
	55	69,9	43,2	202	104
	60	75,1			114
	65				124
	70				134
	75				144
	80				154
	85				164
	90				174
	95				176
	100				179
ARMS DISTANCE (CM)		12	12	12	12
MOBILE BOTTOM LEVER POSITION		1	1	1	3
1000 GRAINS OPERATIVE WEIGHT		-	12 GR	5,6 GR	24 GR

8.2 DOSAGE TABLE. FERTILIZER

FERTILIZER DOSAGE (KG/HA)

SECTOR Nº	MACHINE	
	600/42	600/48
0	0	0
2	37,8	43,2
5	93,6	107
7	131	150
10	187	214
12	225	257
15	281	321
17	319	364
20	375	428
22	412	471
25	469	536
27	506	578
30	562	643
32	600	685
35	656	750
37	694	793
40	750	857
42	772	882
45	805	920
47	827	945
50	860	983

The combined machine only admits granulated fertilizers.

WE SUGGEST TO USE HIGH CONCENTRATION MIXTURE FERTILIZER. OTHERWISE, THE FERTILIZER HOPPER CAPACITY WOULD NOT BE SYNCHRONIZED WITH THAT OF THE SEED HOPPER.

DATE	NOTES

DATE	NOTES

MAQUINARIA AGRÍCOLA SOLÁ, S.L.
Ctra. de Igualada, s/n. 08280 **CALAF** (Barcelona) Spain
Tel. (0034) 93 868 00 60 - Fax (0034) 93 868 00 55