



ARGO

Trailed pneumatic seed drill



STARTING MANUAL

MAINTENANCE AND DOSAGE

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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.



Certified quality system

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Specifications are subject to change or modification without notice.
The pictures included do not necessary show the standard version.

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1- INTRODUCTION

It is essential to read and follow the instructions and recommendations in this manual before operating **the seed drill or precision planter ARGO**. Careful reading enables maximum operator efficiency, prevents accidents and damage, and increases the planter'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, micro granular fertilizer and micro granular pesticide.



MAQUINARIA AGRICOLA SOLÀ RESERVES THE RIGHT TO CHANGE THE ILLUSTRATIONS, TECHNICAL DATA AND TECHNICAL CHARACTERISTICS AT ITS DISCRETION.

2. SAFETY INSTRUCTIONS

2.1 SAFETY SYMBOLS

En este manual encontrará tres tipos de símbolos de seguridad y de peligro:



TO WORK MORE EASILY WITH THE PLANTER.



TO PREVENT DAMAGE TO THE PLANTER 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.



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



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.**



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.**



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



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



Never stand under the sowing equipment or swivel area of the machine's extension tine coulters. **Risk of serious physical injury.**



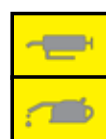
Coupling point for loading and unloading the machine by crane.



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



Do not exceed maximum load



The parts signaled with this pictogram should be kept in good condition and greased.

2.2 GENERAL SAFETY INSTRUCTIONS



- 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.



- 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.



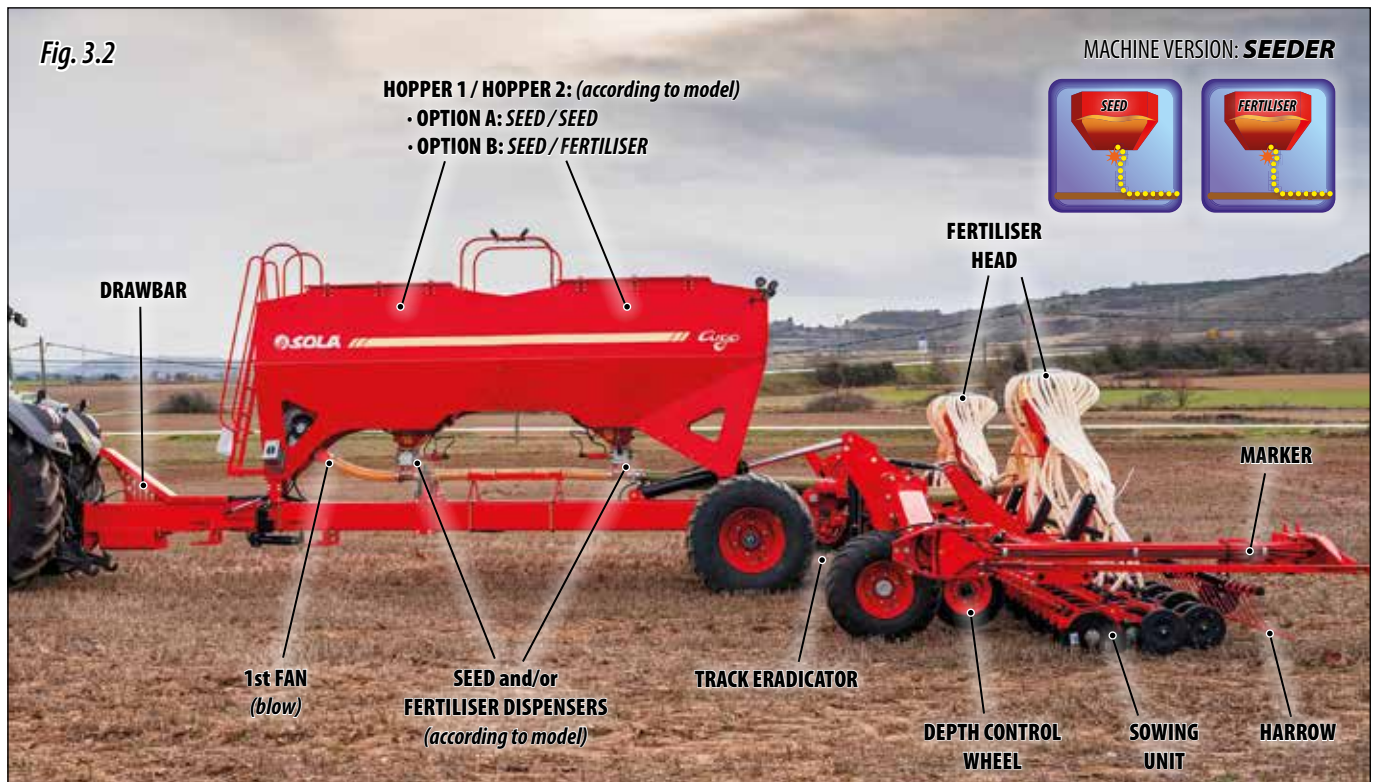
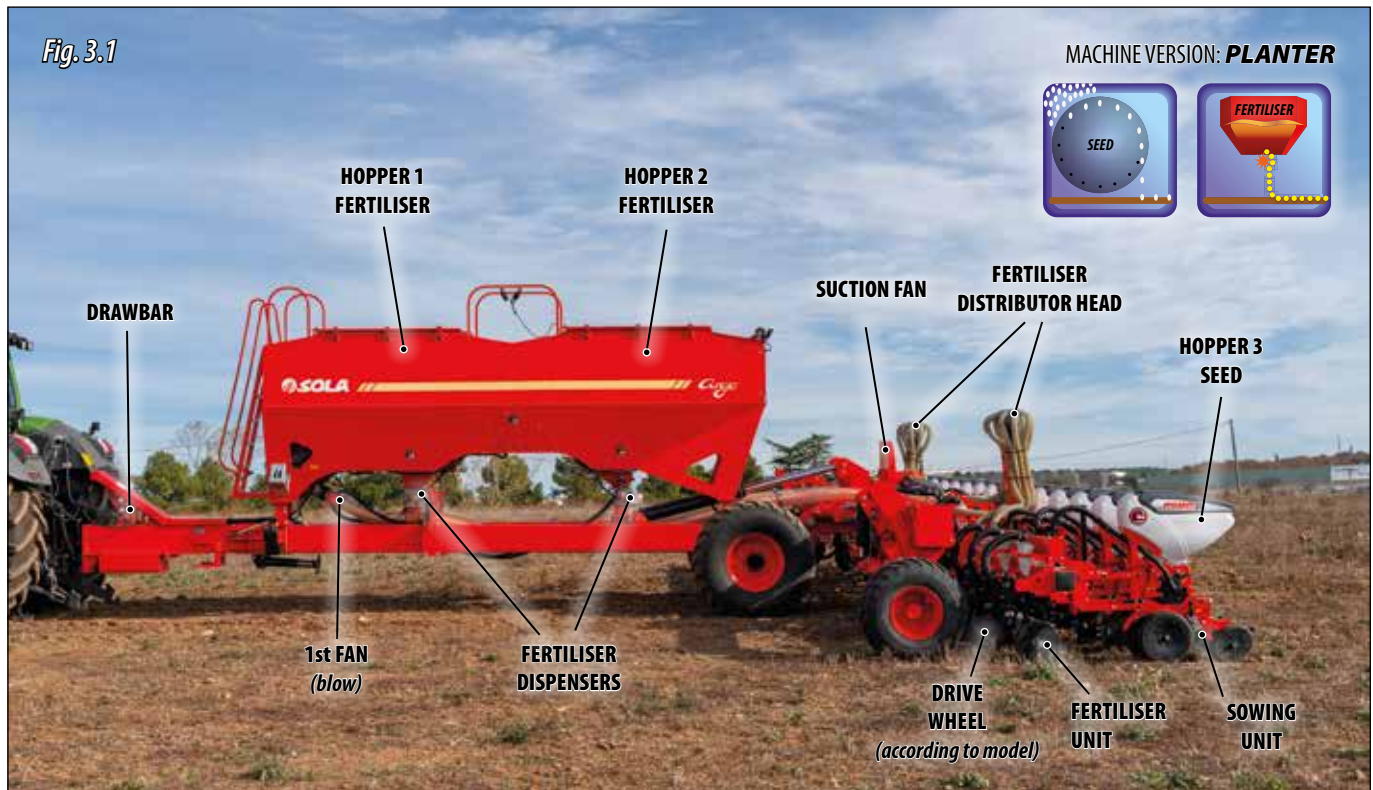
WHEN THE PLANTER IS DELIVERED, IT SHOULD BE IMMEDIATELY CHECKED TO DETECT POSSIBLE DAMAGES DURING TRANSPORTATION OR MISSING PIECES. ONLY THE IMMEDIATE REPORTING OF THIS TO THE DELIVERER WILL RESULT IN COMPENSATION.

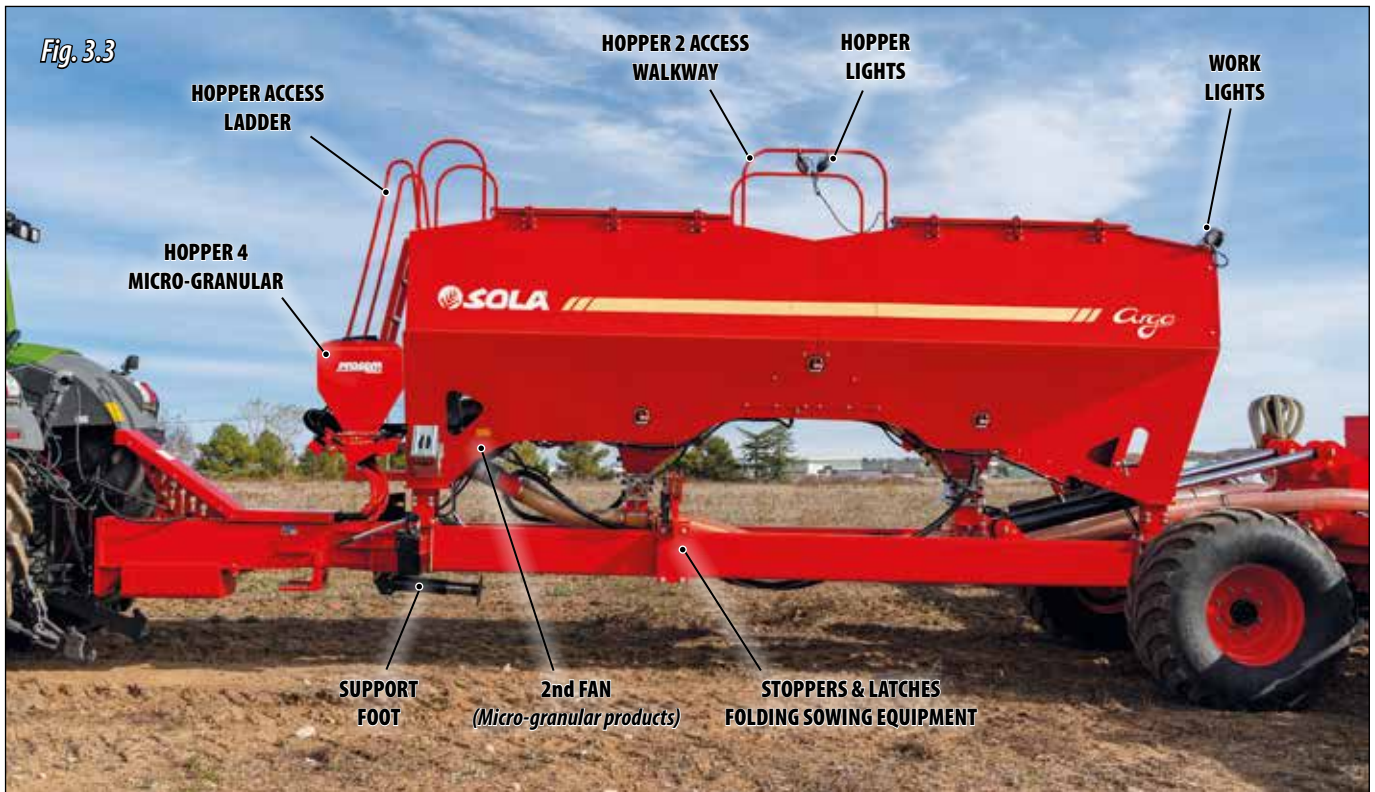


LOADING AND UNLOADING THE MACHINE MUST BE PERFORMED, IF POSSIBLE, USING A BRIDGE CRANE.

3. GENERAL DESCRIPTION

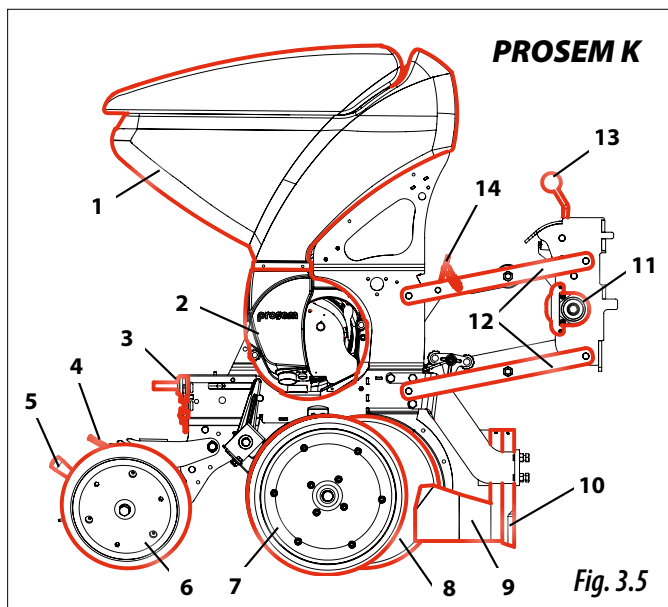
3.1 GENERAL OVERVIEW





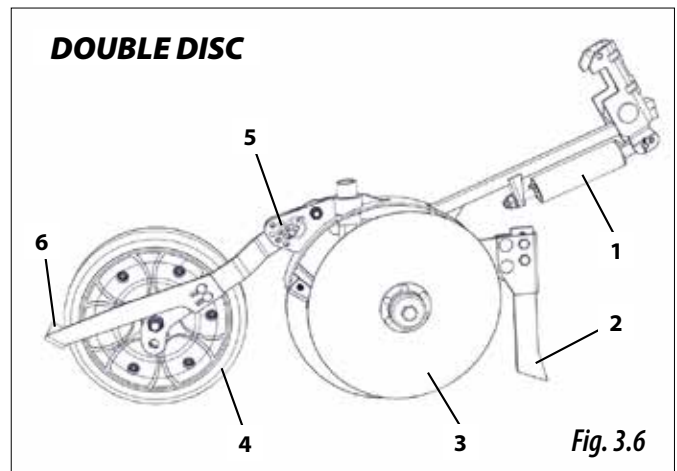
3.1.1 PLANTER SOWING UNIT

- 1- Seed hopper.
- 2- Metering box provided with a selector to adjust the seed distribution.
- 3- Planting depth controller.
- 4- Lever to adjust the pressure that the furrow closing wheels exert onto the ground.
- 5- Lever to adjust the angle which affects the bearing of the furrow closing wheels on the ground.
- 6- Furrow closing wheels : they cover the furrow where the seed has been placed.
- 7- Planting depth control wheels.
- 8- Double disc furrow opener or seed discs: it forms the furrow in which the seed will be placed.
- 9- Clod remover: prevents the clods from being in the way of the planting depth control wheels.
- 10- Blade: helps to break the superficial earth crust.
- 11- Transmission group: transfers the main axle's motion to the metering box in order to turn the seed disc.
- 12- Parallelogram: allows the metering units to move vertically to adapt to the terrain's irregularities.
- 13- Lever to adjust the unit's pressure: it adjusts the load pressure exerted by the double-disc opener (8) onto the ground.
- 14- Coupling mechanism: it allows to couple the unit in raised position in order to exclude it.



3.1.2 SEEDER SOWING UNIT

- 1- Metering unit's pressure spring: it adjusts the load pressure exerted by the double-disc opener (3) onto the ground.
- 2- Blade: helps to break the superficial earth crust.
- 3- Double disc furrow opener or seed discs: it forms the furrow in which the seed will be placed.
- 4- Depth control wheel.
- 5- Depth controller.
- 6- Adjustable scraper.



3.2 TECHNICAL CHARACTERISTICS (PLANTER)

Value	Unit	Value
Number of rows	Quantity	16
Row spacing	cm	70-75
Working Width	m	11.2 - 12
Total Width on working position (without markers)	m	12.2
Total Width on working position (with markers)	m	12.91 (closed markers) / 17.75 (one open marker)
Working Length	m	10.95
Working Height	m	3.7
Fertilizer hopper loading Height	m	3.15
Transport Width	m	3.95
Transport Length	m	8.53
Transport Height	m	4.395
Internal Distance between wheels	cm	169.5
External Distance between wheels	cm	280.5
Wheels	Quantity x Dimension	2 x 650/60-R22.5 or 2 x 560/60-R22.5
Fertilizer hopper capacity	Quantity x Capacity L	2 x 3,100
Fertilizer drive	Electrical / Mechanical	Electrical
Micro hopper capacity	Quantity x Capacity L	2 x 185
Micro Drive	Electrical / Mechanical	Electrical
Seed hopper capacity	Quantity x Capacity L	16 x 50
Metering unit drive for seed	Electrical / Mechanical	Electrical / Mechanical
Markers	Machine Centre / Tractor Wheel	Tractor Wheel
Base weight (minimum)	kg	8,320
Hydraulic Connections	Quantity and use SA = Single-Acting DA = Double-Acting	1 DA, 4 SA + 1 free return (ELEKTRA with micro) 1 DA, 3 SA + 1 free return (ELEKTRA without micro or mechanical with micro)
Oil Flow requirement (minimum)	L x application	140 l/min ELEKTRA with micro 120 l/min ELEKTRA without micro or mechanical with micro 100 l/min mechanical without micro
Power requirement (minimum)	HP	240
Connection pin with tractor (diameter)	mm	50
Maximum fertilizer dosage at 8 km/h	Kg/Ha	300
Maximum micro fertilizer dosage at 8 km/h	Kg/Ha	40

3.3 TECHNICAL CHARACTERISTICS (SEEDER)

Value	Unit	Value
Number of rows	Quantity	76
Row spacing	cm	15.8
Working Width	m	12
Total Width on working position (without markers)	m	11.95
Total Width on working position (with markers)	m	12.91 (closed markers) / 17.75 (one open marker)
Working Length	m	10.97
Working Height	m	3.7
Fertilizer hopper loading Height	m	3.15
Transport Width	m	3.66
Transport Length	m	8.53
Transport Height	m	4.395
Internal Distance between wheels	cm	169.5
External Distance between wheels	cm	280.5
Wheels	Quantity x Dimension	2 x 650/60-R22.5 or 2 x 560/60-R22.5
Seed/Fertilizer hopper capacity	Quantity x Capacity L	2 x 3,100
Seed/Fertilizer drive	Electrical / Mechanical	Electrical
Markers	Machine Centre / Tractor Wheel	Tractor Wheel
Base weight (minimum)	kg	8,320
Hydraulic Connections	Quantity and use SA = Single-Acting DA = Double-Acting	1 DA, 3 SA + 1 free return
Oil Flow requirement (minimum)	L	100 l/min
Power requirement (minimum)	HP	240
Connection pin with tractor (diameter)	mm	50
Maximum seed dosage a 10 km/h	Kg/Ha	400
Maximum seed/fertilizer dosage a 10 km/h	Kg/Ha	200/200

3.4 IDENTIFICATION OF THE MACHINE

All machines are supplied with a NAMEPLATE on the drawbar, detailing:

- 1- Manufacturer's name and address.
- 2- Model number of the machine.
- 3- Machine type.
- 4- Serial number.
- 5- CE Marking and year of manufacture (to last digits).



Fig. 3.7

3.5 USE ACCORDING TO DESIGN

The **ARGO** planter has been manufactured specifically for sowing cereals and other grain seeds and spreading fertiliser (according to model).

The machine has been designed to be trailed by a farm tractor.

If any other use of the machine results in it being damaged, the manufacturer accepts no responsibility for this.

You must comply with all legal provisions regarding safety on the machines, road safety and occupational health and safety.

Any modifications made by the user will invalidate the manufacturer's warranty for any resulting damage that may occur.

Avoid using wet seeds and fertilisers. Using these may clog or break the components.



MAQUINARIA AGRÍCOLA SOLÀ RESERVES THE RIGHT TO CERTIFY ITS MACHINES IN THE MARKETS THAT IT DEEMS NECESSARY.



DEPENDING ON THE CONDITIONS OF USE DEFINED BY THE MACHINE'S END USER AND ANY OPTIONAL EQUIPMENT INCLUDED, DURING TRANSPORTATION THE MACHINE MAY NOT COMPLY WITH THE CURRENT REGULATIONS FOR HIGHWAYS AND PUBLIC ROADS. COMPLYING WITH THE ROAD TRAFFIC REGULATIONS IS THE SOLE RESPONSIBILITY OF THE END USER OF THE MACHINE. MAQUINARIA AGRÍCOLA SOLÀ WILL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR THE CONSEQUENCES OF A VIOLATION OF THE CURRENT ROAD TRAFFIC REGULATIONS IN THE COUNTRY WHERE ITS MACHINES ARE SENT.

4. ESSENTIAL SOWING CONCEPTS

4.1 TERRAIN

The better the soil condition, the better the sowing quality. Work is more difficult on big clods or uneven furrows. Although machines resist harsh conditions, if the seedbed does not satisfy appropriate conditions then the sowing quality will suffer.

4.2 THE SEED

It is essential to use high-quality, clean and uniform seeds.

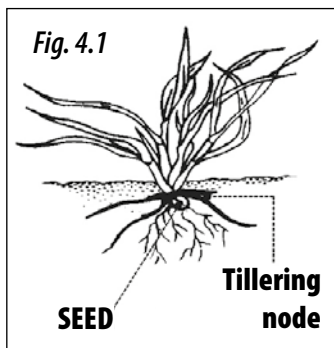
4.3 SEED PLANTING DEPTH

The seed planting depth has consequences for tillering, as well as for the plant's strength and its ability to resist frostbite or drought. The parent shoot grows from 1 to 2 cm under the ground, whatever the depth of the seed.

Planting deeper does not necessarily mean getting deeper roots. Only a few roots grow from the lower part of the seed. Most of them grow from a parent shoot close to ground level.

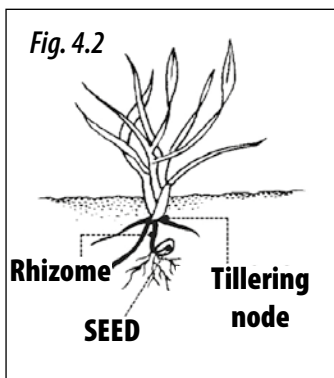
Normal Planting Depth: from 2 to 4 cm

- Thick stem, short rhizome and resistant to frostbite.
- Multiple tillering providing from 3 to 6 shoots and a lot of blades, from 6 to 10.
- Deep and thick roots, approximately 5 cm in width and 10-12 cm in depth.
- With less grains per sowing square metre, more ears are obtained.



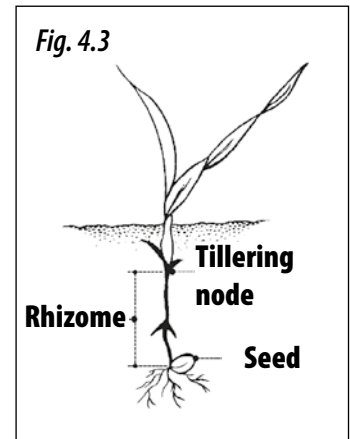
Deeper Planting: from 5 to 6 cm

- Fine stem, rhizome exposed to frostbite.
- Late and weak tillering, 1 or zero shoots and only a few blades, 3-4 approx.
- Medium quality roots of approximately 3 cm in width and 5 cm in depth.
- More grains per sowing square metre are required to obtain the same number of ears as in the previous case.



Very deep planting: from 8 to 10 cm

- Very fine stem. No tillering and only one blade.
- Seed runs out of supplies by growing a long rhizome which frostbite can easily cut.
- The plant takes weak roots, approximately 1 cm in width and 3 cm in depth.
- Twice the number of grains per sowing metre are required to obtain the same number of ears as in the first case.



IN VERY COLD PLACES, REPEATED FROSTBITE CAN HAVE A HONEYCOMB EFFECT ON THE GROUND'S MOST SUPERFICIAL LAYER. IN THIS CASE THE PLANT'S VERY FIRST ROOTS CAN LOOSEN AND THE PLANT WILL DIE. SLIGHTLY DEEPER PLANTING IS RECOMMENDED AND IF POSSIBLE, THE USE OF ROLLERS TO COMPACT THE EARTH TO BETTER PROTECT THE SEEDS.



WHEN STARTING THE MACHINE, FURROWS WILL NOT CONTAIN ANY SEEDS FOR A METRE. WHEN STOPPING THE MACHINE, SEEDS WHICH WERE PREVIOUSLY INSIDE THE SEED HOSES, SLIDE FROM THE MACHINE AND END UP PILED ON THE GROUND. TAKE THIS INTO ACCOUNT WHEN STOPPING AND STARTING THE MACHINE IN ORDER TO ACHIEVE MORE ACCURACY.



ALWAYS WORK AT A UNIFORM SPEED AS SUDDEN ACCELERATING AND SLOWING DOWN WILL CAUSE AN IRREGULAR SEEDS DISTRIBUTION.



THE RECOMMENDED PLANTING DEPTH VARIES DEPENDING ON THE TYPE OF CROP, SO WE RECOMMEND THAT THE FARMER GETS PROFESSIONAL ADVICE FROM EXPERTS OR SPECIALISTS IN THIS AREA.

5. STARTING

Before working with the planter, the following points should be taken into account:

- Check that all the components of the planter are correctly lubricated. Grease periodically the mechanical elements.
- Check the tyre pressure.
- In the case that the planter is equipped with an automatic transmission gearbox, check the oil level.
- Check that the ducts of the hydraulic system of the planter are in good condition.
- Check that the ducts of the suction system are in good condition.
- Adjust the height of the front hitch according to the tractor being used.
- Check the tightening torque of the wheel studs.

After coupling the planter to the tractor:

- Check the planter is correctly coupled to the tractor.
- Before starting the planter, become familiar with all its parts and adjustments.
- Start the planter when the hopper is empty in order to free the pipes from condensation water or impurities.
- Adjust the planter and all its components to the type of terrain to be planted on.

5.1 COUPLING TO THE TRACTOR

The **ARGO** planter features a ring-type hitch or ball hitch.



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



THESE OPERATIONS REQUIRE THE UTMOST ATTENTION TO PREVENT PHYSICAL INJURIES TO THE PERSON OPERATING THE MACHINE.

For the coupling maneuver, follow these steps:

- 1-** Connect the planter's rotating ring or ball hitch to the tractor, at the coupling point for trailers (Fig. 5.1).
- 2-** Raise the machine's support foot.



Fig. 5.1

- 3-** Connect the following plugs from the hydraulic system to the tractor's hydraulic connections



THE HYDRAULIC CONNECTIONS NECESSARY FOR THE MACHINE ARE DETAILED IN SECTION 5.3 HYDRAULIC CONNECTIONS.

- 4- Connect the 7-pin electrical plug to the tractor for the indicator lights and work lights.
- 5- Connect the ISOBUS cable to the tractor's ISOBUS socket.
- 6- Connect the 3-pin cable.



BEFORE RUNNING WITH THE MACHINE, PLEASE CHECK THAT IT IS CORRECTLY COUPLED TO THE TRACTOR.



TO UNCOUPLE THE MACHINE FROM THE TRACTOR, PERFORM THE FORMER STEPS IN THE REVERSE ORDER.

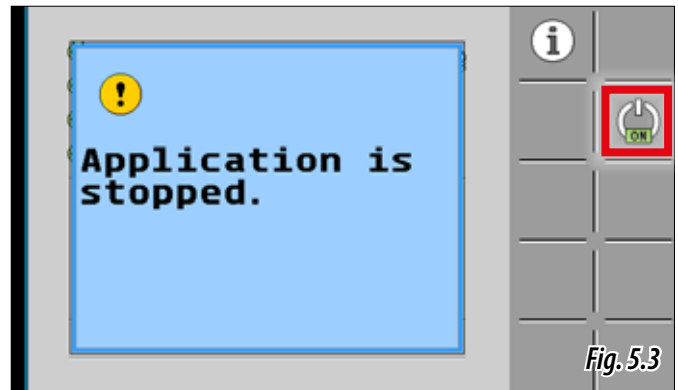


IMPORTANT: WHEN UNCOUPLING THE MACHINE FROM THE TRACTOR, TAKE CARE NOT TO LEAVE ANY HYDRAULIC OR ELECTRICAL CIRCUIT CONNECTED TO THE TRACTOR.



IMPORTANT: IN THE EVENT OF A FAULT, ALWAYS CHECK THE ELECTRICAL CONNECTIONS.

- 7- With the application off (APP OFF), unfold the chassis and distributor heads (Fig. 5.3). To do this, operate the chassis's hydraulics that are marked in yellow.

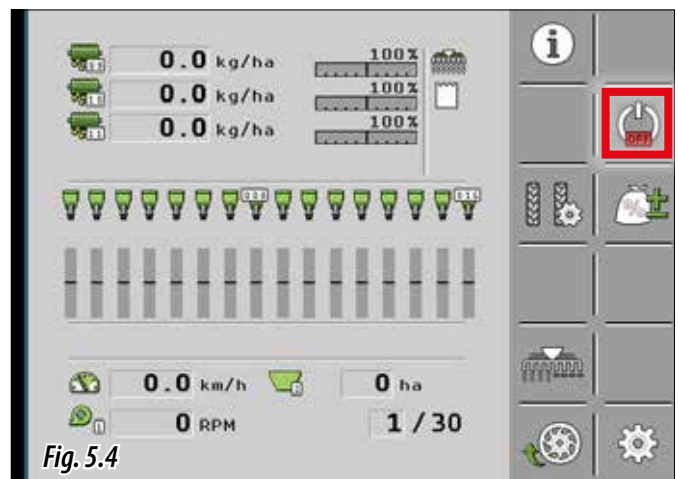


IMPORTANT: THE DISTRIBUTOR HEADS MUST BE IN A FULLY UPRIGHT POSITION. OTHERWISE, CONTINUE DELIVERING A FLOW TO THE HYDRAULIC CIRCUIT.



IMPORTANT: PUT THE SOWING UNIT'S HYDRAULIC CIRCUIT IN THE FLOAT POSITION.

- 8- With the application on (APP ON) (Fig. 5.4), unfold the marker (according to model); to do this, operate the markers' hydraulics that are marked in yellow. To change markers, apply pressure to fold up one marker and then apply pressure again to unfold the opposite marker.



5.2 ELECTRICAL CONNECTIONS

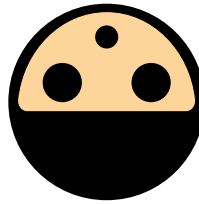
The machine has electrical connections for:

- INDICATOR LIGHTS.
- ISOBUS CONNECTION.
- HYDRAULIC CONTROL AND WORK LIGHTS.



IMPORTANT: CONNECT ALL OF THE CABLES; OTHERWISE THE MACHINE WILL NOT WORK.

5.2.3 HYDRAULIC CONTROL AND WORK LIGHTS



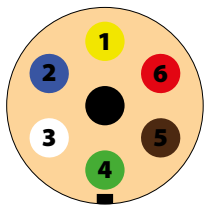
The machine is powered via the 3-pin connector (in accordance with standard DIN 9680).



IMPORTANT: IF THIS CABLE IS NOT CONNECTED, IT WILL NOT BE POSSIBLE TO COMPLETE ANY MOVEMENT WITH THE CHASSIS OR MARKERS.

5.2.1 INDICATOR LIGHTS

All models have a 7-pin connector for indicator lights.
7-pin connector diagram and table (according to ISO 1724):

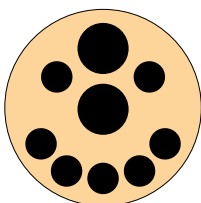


Pin no.	Standard	FUNCTION
1	L	Left indicator light
2	54G	Fog light
3	31	Earth
4	R	Right indicator light
5	58R	Right position lamp
6	54	Brake
7	58L	Left position lamp

To turn the work or hopper lights on or off, follow these steps:



5.2.2 ISOBUS



The machine must have the 9-pin connector (according to ISO 11783) to allow the machine to connect to the tractor's ISOBUS system.



WHEN TRANSPORTING THE MACHINE ON PUBLIC ROADS, MAKE SURE THAT THE WORK LIGHTS ARE SWITCHED OFF.

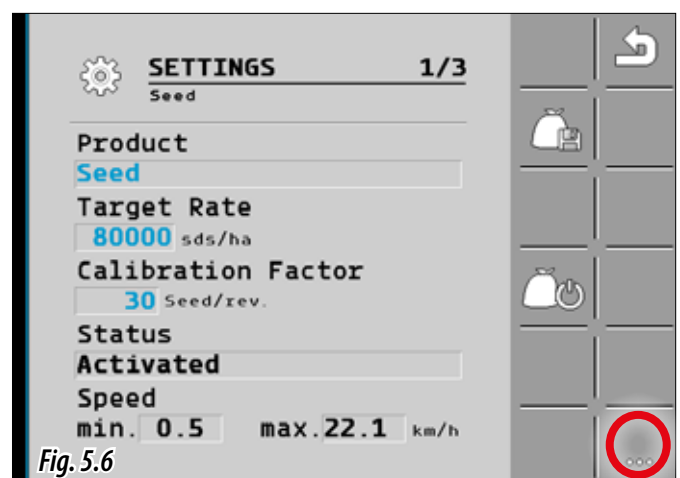




Fig. 5.7

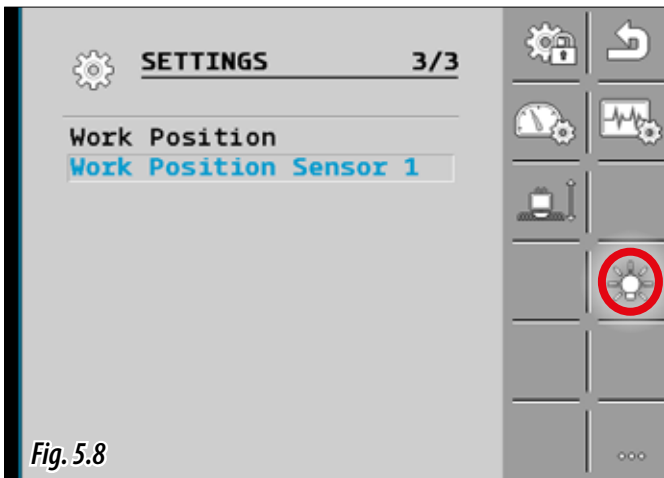


Fig. 5.8

Turn on the desired light; work lights (green) and/or hopper lights (yellow)

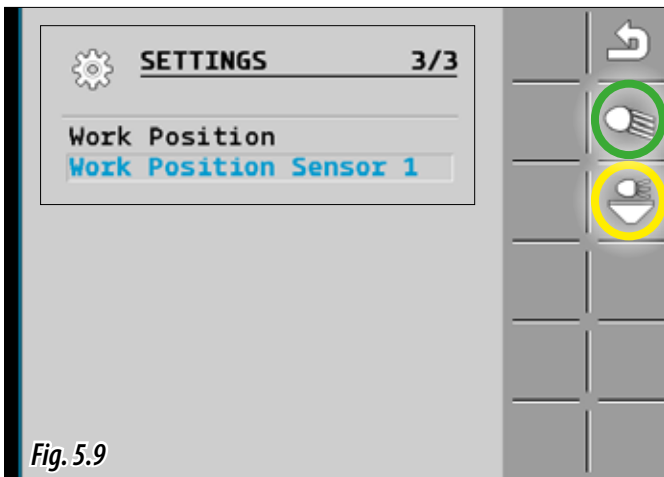


Fig. 5.9

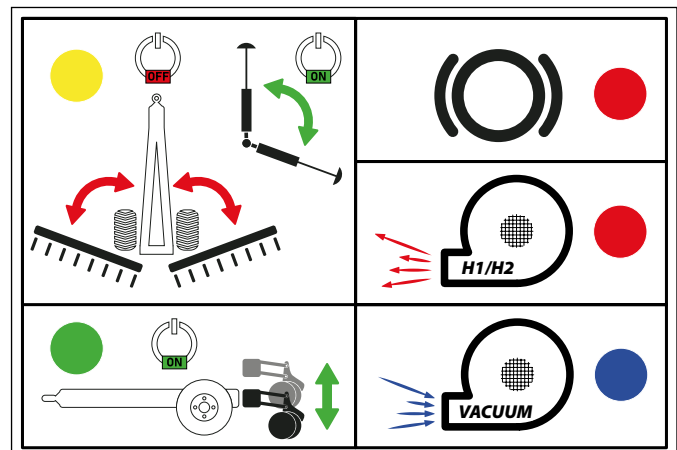
5.3 HYDRAULIC CONNECTIONS

The machine requires hydraulic connections to:

- FOLD/UNFOLD AND ROTATE THE SOWING WINGS AND FOLD/UNFOLD THE MARKERS (according to model). A double outlet. Maximum 80 l/min.
- LOWER AND RAISE THE SOWING EQUIPMENT. A single outlet.
- HYDRAULIC BLOW FAN FOR THE PNEUMATIC CONVEYING OF THE MAIN HOPPERS (1 & 2); HOPPERS FOR MICRO-GRANULAR PRODUCTS (according to model); AND POWER GENERATION (according to model). A single outlet.
- HYDRAULIC SUCTION FAN (according to model). A single outlet.
- HYDRAULIC SERVICE BRAKE. A single outlet.
- FREE RETURN FOR ALL SINGLE OUTLETS.

The different hydraulic circuits can be distinguished by colours, as shown on the table below:

CAP COLOUR	DESCRIPTION
YELLOW	For FOLDING/UNFOLDING the chassis (APP OFF) For FOLDING/UNFOLDING markers (APP ON)
GREEN	To RAISE/LOWER the sowing equipment
RED	Blow fan OPERATION
BLUE	Suction fan OPERATION
RED	Hydraulic circuit for the service brake
RED	For the FREE RETURN





IMPORTANT: THE MAXIMUM FLOW RATE FOR THE HYDRAULIC CIRCUITS WITH YELLOW AND GREEN CAPS MUST NOT EXCEED 80 L/min.



ALWAYS PERFORM MAINTENANCE TASKS ON THE MACHINE WITH THE HYDRAULIC CONNECTIONS DISCONNECTED.



WHEN CLOSING OR OPENING THE FOLDABLE PARTS AND MARKERS, MAKE SURE THAT THERE IS NOBODY NEAR TO THE MACHINE OR ANY FOREIGN OBJECTS IN THE PATH OF MOVING PARTS.



IF THE MACHINE DOES NOT RESPOND WHEN HYDRAULIC PRESSURE IS BEING DELIVERED, CHECK THAT THE HYDRAULIC AND ELECTRICAL CONNECTORS ARE PROPERLY CONNECTED TO THE TRACTOR'S DISTRIBUTOR AND THAT THE HYDRAULIC CIRCUITS' SHUT-OFF VALVES ARE OPEN.



KEEP THE HYDRAULIC PIPES IN A GOOD CONDITION. PRESSURISED OIL CAN PENETRATE THE SKIN AND CAUSE VERY SERIOUS INJURIES.



THE HYDRAULIC CONNECTORS SUPPLIED BY THE MANUFACTURER MUST BE USED.

5.4 TRANSPORT POSITION

With the machine hitched to the tractor and the hydraulic circuits connected to it, follow these steps:

- 1- Check that all of the seed hoppers are closed properly (according to model) (Fig. 5.10).



Fig. 5.10

- 2- Close the valve of the seed distributors (according to model); to do this loosen the knob, turn the lever to its lowest position and tighten the knob to fix it there. Repeat this process for all sowing units (Fig. 5.11).



Fig. 5.11

- 3- Place all of the sowing unit's levers in the transport position (in red, Fig. 5.12) (according to model).



Fig. 5.12

- 4- Fold up the markers (according to model). To do this, the application must be on (APP ON).
- 5- Fold up the distributor heads and chassis. To do this, the application must off (APP OFF).



IMPORTANT: MAKE SURE THAT THE DISTRIBUTOR HEADS ARE FULLY FOLDED UP BEFORE ROTATING AND FOLDING UP THE CHASSIS.

- 6- When the chassis is folded, continue delivering hydraulic pressure for a further 5 seconds.



IMPORTANT: BEFORE TRANSPORTING THE MACHINE ON PUBLIC HIGHWAYS OR ROADS, MAKE SURE THAT THE LATCHES ARE CLOSED (FIG. 5.13).



Fig. 5.13



IMPORTANT: BEFORE TRANSPORTING THE MACHINE ALONG ANY TYPE OF ROAD, MAKE SURE THAT THE SERVICE BRAKES ARE IN GOOD WORKING ORDER, BOTH ON THE TRACTOR AND ON THE MACHINE.



IMPORTANT: BEFORE FOLDING THE MACHINE, MAKE SURE THAT THE SOWING UNITS ARE IN THE WORKING POSITION AND NOT DISABLED.

5.5 FILLING AND EMPTYING THE HOPPERS

The machine has several hoppers, depending on the model and its configuration:

PLANTER version:

- SEED HOPPERS ON THE SOWING UNITS.
- CENTRAL HOPPERS FOR MICRO-GRANULAR FERTILISER.
- CENTRAL HOPPERS FOR MICRO-GRANULAR PRODUCTS.

SEEDER version:

- CENTRAL HOPPERS FOR SEEDS and/or MICRO-GRANULAR FERTILISER.
- CENTRAL HOPPERS FOR MICRO-GRANULAR PRODUCTS.

In order to safely and quickly fill the hoppers, the best way is using a WORM DRIVE. A hydraulic crane can also be used to raise the BIG BAG above the hopper in order to fill it. Check that the whole bag volume fits into the hopper. To secure the BIG BAG to the crane, follow the instructions provided by the its manufacturer.



IMPORTANT: BEFORE FILLING THE HOPPERS, FIRST CHECK THAT NO FOREIGN OBJECTS HAVE BEEN LEFT INSIDE.



IMPORTANT: BEFORE FILLING THE HOPPER, MAKE SURE THAT THE VALVES AND DRAIN OUTLET ARE PROPERLY CLOSED.



CHECK THAT THE PLANTER IS EMPTY, CLEAN AND DRY.



DO NOT DEPOSIT EXTERNAL ELEMENTS INSIDE THE HOPPERS. BEFORE FILLING IT CHECK THAT IT CONTAINS NO OBJECT AND THE PRODUCT OUTLET IS NOT BLOCKED.



IMPORTANT: FOR LOADING AND EMPTYING THE HOPPER, THE OPERATOR MUST USE APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) (DUST MASK, GLASSES AND GLOVES).

5.5.1 SEED HOPPERS (SEE PLANTER)

To **FILL** the planter's sowing units with seeds, open the hopper cover's quick release latch (Fig. 5.14).



FILL ONLY THE HOPPERS OF THE METERING UNITS WHICH ARE TO BE USED.



BEFORE FILLING THE SEED HOPPERS, MAKE SURE THAT THE SEED DISC INSTALLED ON THE DISTRIBUTOR OF EACH SOWING UNIT IS SUITABLE FOR THE SEED BEING PLANTED AND THE DISTANCE BETWEEN THE SEEDS.

To **EMPTY** the metering units' hoppers, follow these steps:

- 1- Manually turn the emptying gate to its open position (A, Fig. 5.15).
- 2- Once the hopper has been emptied, return the emptying gate to its closed position (B, Fig. 5.15).



5.5.2 CENTRAL HOPPERS

To **FILL** the hopper, follow these steps:



IMPORTANT: COMPLETE THIS PROCESS WITH THE FANS OFF.

- 1- Access the hoppers via the access ladder.
- 2- Release the lock on the cover (Fig. 5.16).



- 3- Turn the cover lock's lever (Fig. 5.17) and open the cover (Fig. 5.18).



- 4- Access the second hopper via the walkway (Fig. 5.19). Repeat the above steps to open the cover.



Fig. 5.19



IMPORTANT: BEFORE STARTING TO FILL THE HOPPER WITH PRODUCT, MAKE SURE THAT THE DRAIN OUTLETS ARE PROPERLY CLOSED AND THE DISPENSER VALVE IS BLOCKING THE MATERIAL FROM ENTERING THE DISPENSER.

- 5- Fill the hoppers with product.
- 6- When the hoppers have been filled, perform the above steps in reverse order to close the lids.

To **EMPTY** the hopper, follow these steps:

- 1- Place a sack or container below the drain outlets.
- 2- Open the drain outlets. To do this, loosen the knobs (A, (Fig. 5.20)) and move the drain outlet. When the outlet moves, the hopper will start to empty.



Fig. 5.20

- 3- Close the drain outlets and tighten the knobs (A, Fig. 5.20) when the material stops falling.
- 4- Empty the product dispensers; to do this, place a sack or container below the dispensers (Fig. 5.21).
- 5- Remove the R-clip (Fig. 5.22).
- 6- Remove the knobs (Fig. 5.23).

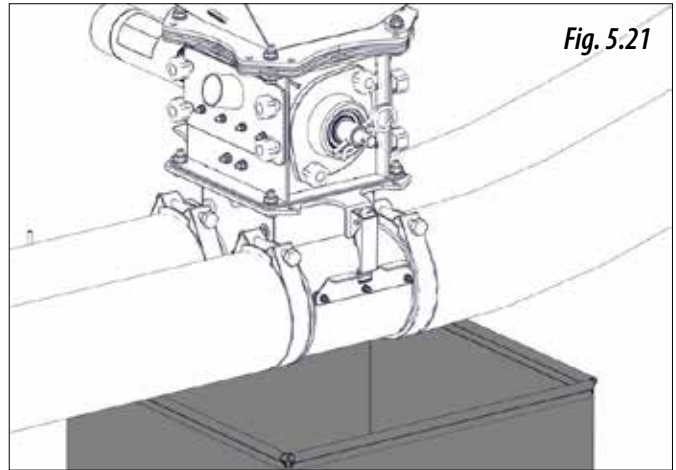


Fig. 5.21

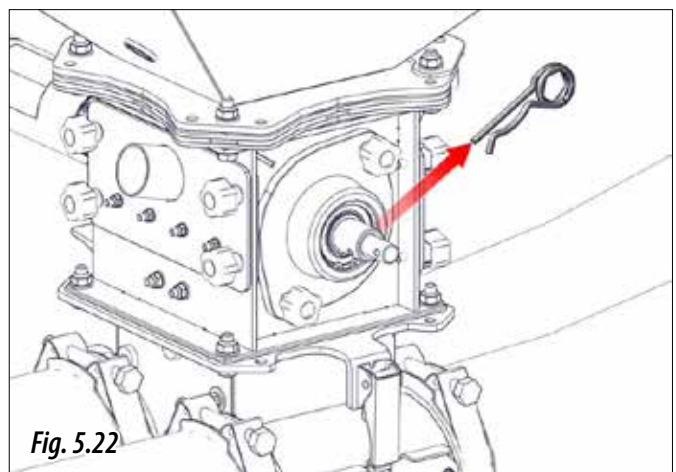


Fig. 5.22

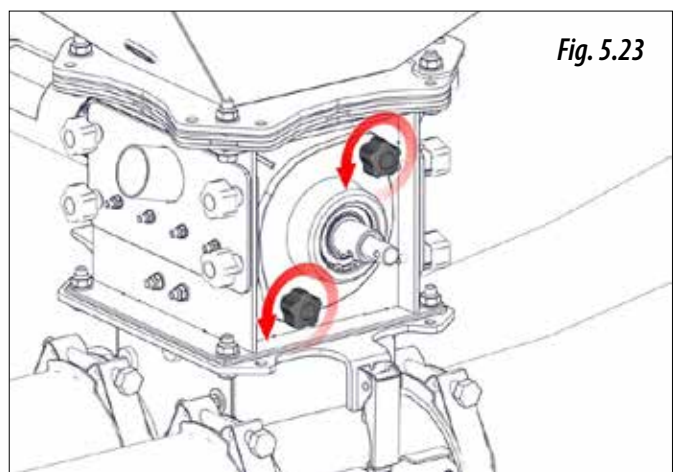


Fig. 5.23

7- Remove the side support (Fig. 5.24) and remove the roller (Fig. 5.25). Then any material that has accumulated in the dispenser will start to empty out.



CLEAN THE DISPENSER WITH A BRUSH AND/OR PRESSURISED AIR. NEVER CLEAN IT WITH WATER.

8- Open the latches, one on either side of the dispenser (Fig. 5.26).

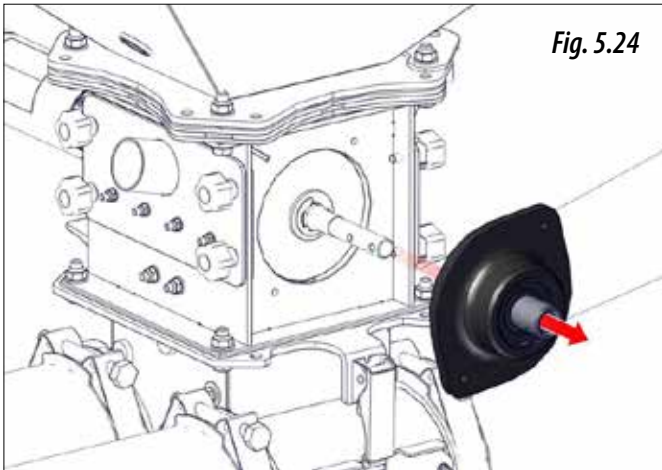


Fig. 5.24

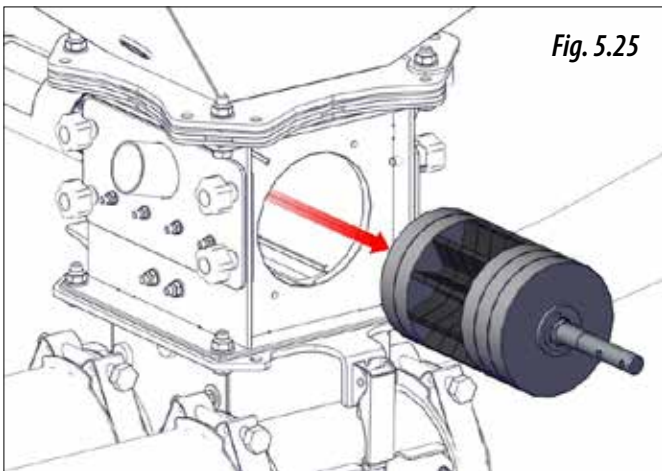


Fig. 5.25

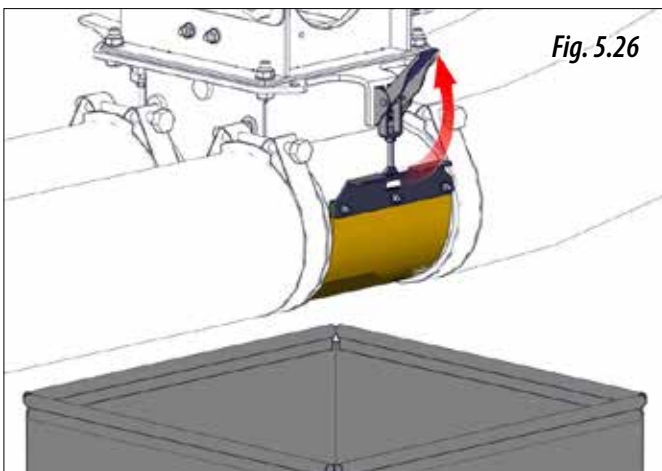


Fig. 5.26

9- Repeat the above steps to clean the second dispenser.

10- Reassemble the dispensers by following the above steps in reverse order.

11- Close the valves above the dispensers; to do this, remove the knobs (Fig. 5.27).

12- Turn the valve (Fig. 5.28) and fully insert it into the slot on the dispenser (Fig. 5.29 and Fig. 5.30).

13- Install and tighten the knobs to secure the valve (Fig. 5.31)

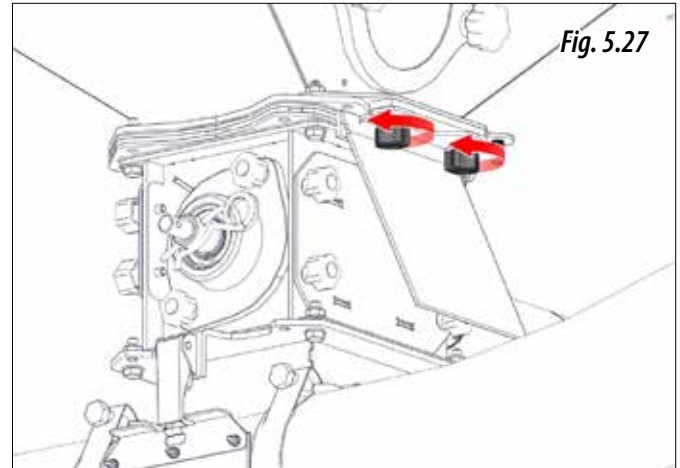


Fig. 5.27

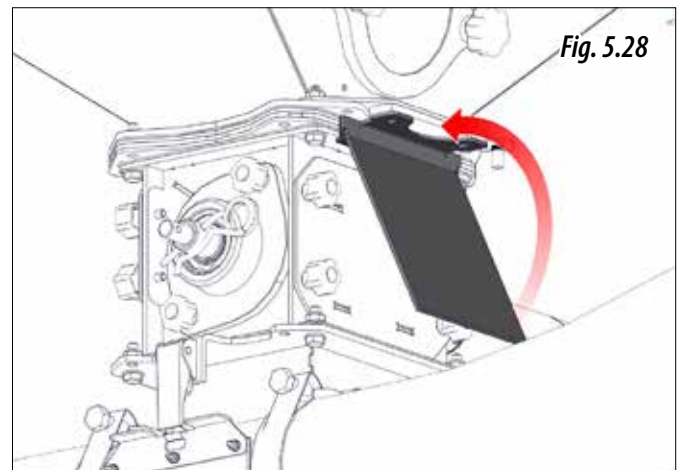


Fig. 5.28

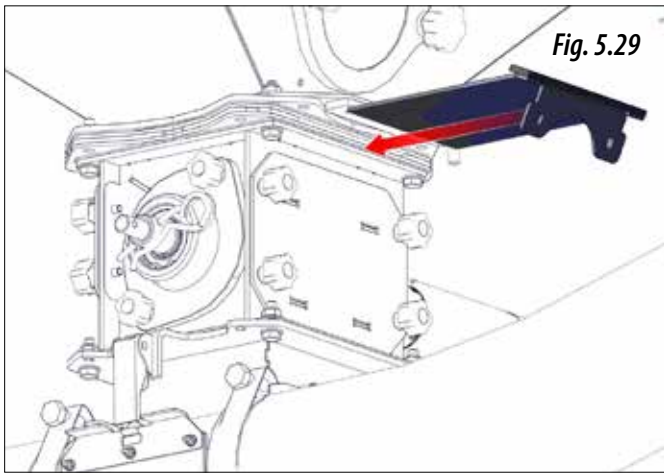


Fig. 5.29

5.5.3 CENTRAL HOPPERS FOR MICRO-GRANULAR PRODUCTS

To **LOAD** microgranular or insecticide products the operator must make sure that there are no leftover products in the hoppers, if there are the hopper must be emptied and cleaned before proceeding to fill it.



AFTER USING MICROGRANULAR AND/OR INSECTICIDE EQUIPMENT, EMPTY AND CLEAN THE HOPPERS ON A DAILY BASIS (SEE SECTION 10.3 CLEANING THE SEED DRILLS). IF THIS IS NOT CARRIED OUT THE MACHINE COULD BE DAMAGED.

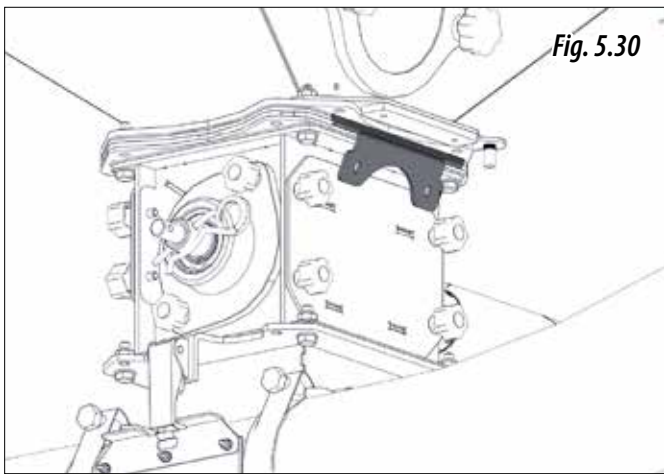


Fig. 5.30



IMPORTANT: AFTER FILLING THE HOPPER, CLOSE THE LID PROPERLY. OTHERWISE THE HOPPER WILL LOSE PRESSURE, MAKING IT NECESSARY TO INCREASE THE SPEED OF THE FAN, REDUCING THE DISPENSING CAPACITY.

To **EMPTY** the microgranular or insecticide hoppers:



IMPORTANT: COMPLETE THIS PROCESS WITH THE FANS OFF.

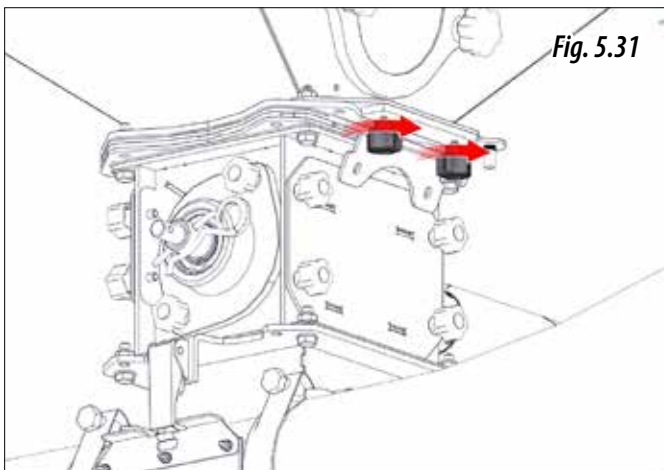


Fig. 5.31

1- Remove the EMPTYING GATE, to do this the two knobs must be removed (A, Fig. 5.32).

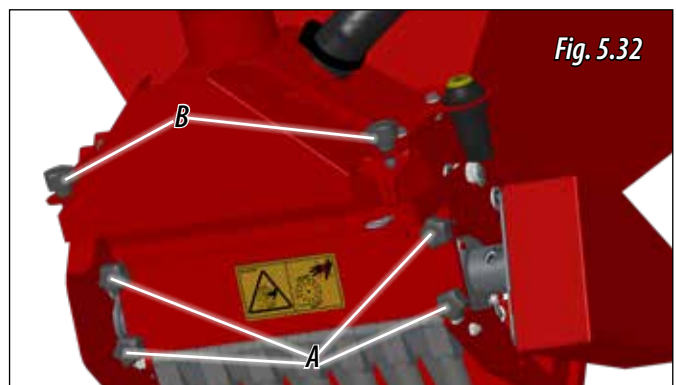
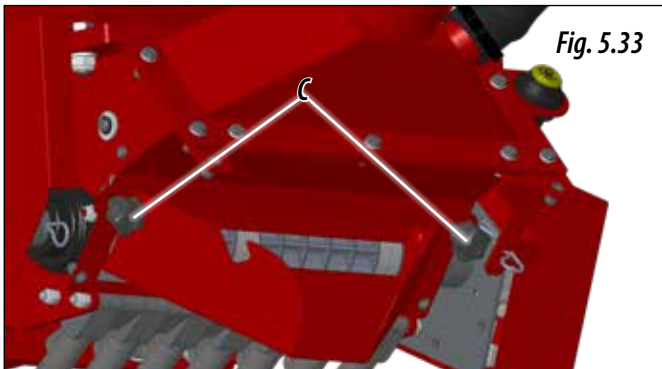
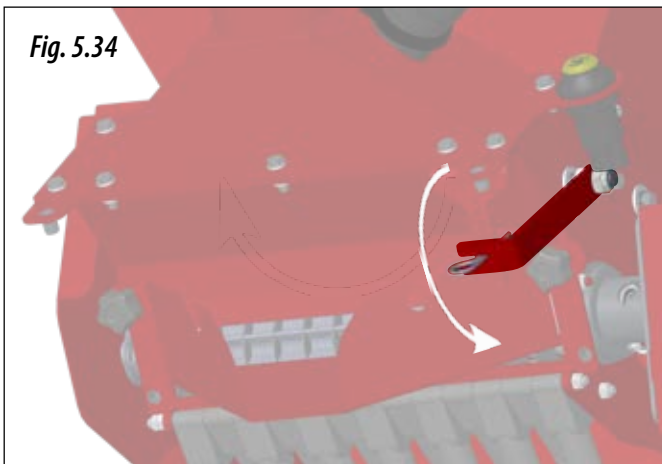


Fig. 5.32

- 2- Remove the EMPTYING CONE knobs (B, Fig. 5.32) and put the cone in position for emptying, fixing the cone with the knobs (C, 5.33).



- 3- Place a sack or a container beneath the drop point of the cone to collect the excess material from the hopper.
- 4- Take the pin out (Fig. 5.34) to free the GRANULOMETRY LEVER. Pull the lever down until the hopper is emptied.



- 5- Turn the roller, for this purpose, make a FALSE calibration test but without modifying any previous values loaded on the monitor (see section 8.2.2 CALIBRATION TEST).
- 6- Once the hopper is empty, return the lever to the previous position and fix it with the pin.



DO NOT ATTACH ANY TYPE OF CONTAINER OR BAG TO THE CONE FOR EMPTYING.

5.6 SUPPORT FEET

The machine is equipped with a main support foot for the trolley (see section 5.6.1 MAIN SUPPORT FOOT) and other support feet for the sowing units, according to the model (see section 5.6.2 SOWING EQUIPMENT SUPPORT FEET).



RAISE THE SUPPORT FEET BEFORE WORKING WITH THE MACHINE. DAMAGE MAY BE CAUSED IF THE SUPPORT FEET ARE LOWERED DURING WORK.



ADJUST THE SUPPORT FEET WITH THE MACHINE HITCHED TO THE TRACTOR.

5.6.1 MAIN SUPPORT FOOT

The front support foot is located on the hopper drawbar. To **LOWER** the support foot you must:

- 1- Hold the support foot and release the locks to unlock the position of the foot (Fig. 5.35).
- 2- Lower the support foot until the locks are engaged.
- 3- Adjust the height of the foot by moving the lever (Fig. 5.36).

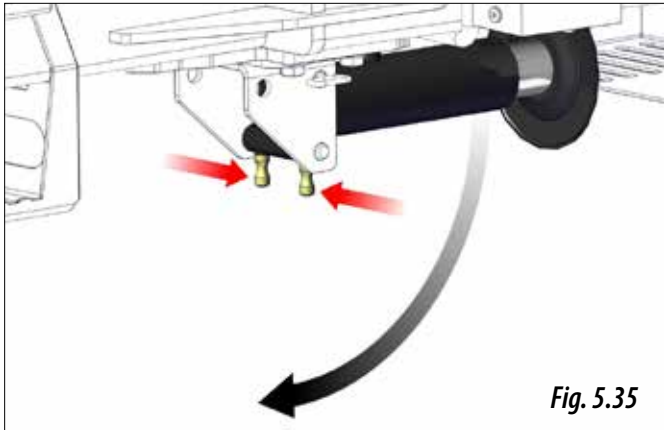


Fig. 5.35

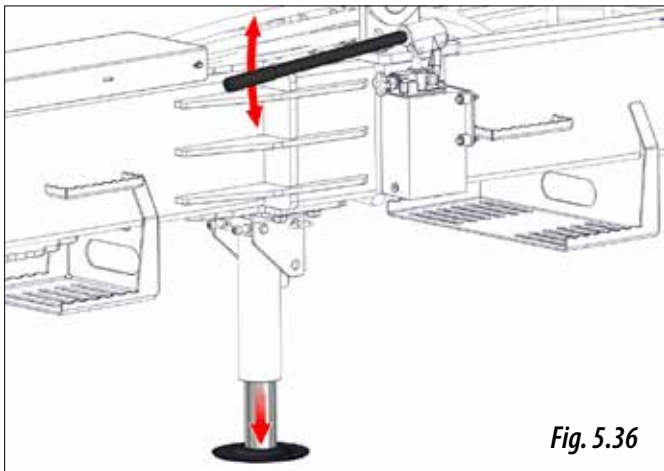


Fig. 5.36



IMPORTANT: BEFORE LOWERING THE SUPPORT FOOT, MAKE SURE THAT THE HYDRAULIC HAND PUMP'S KNOB IS PROPERLY CLOSED (FIG. 5.37).

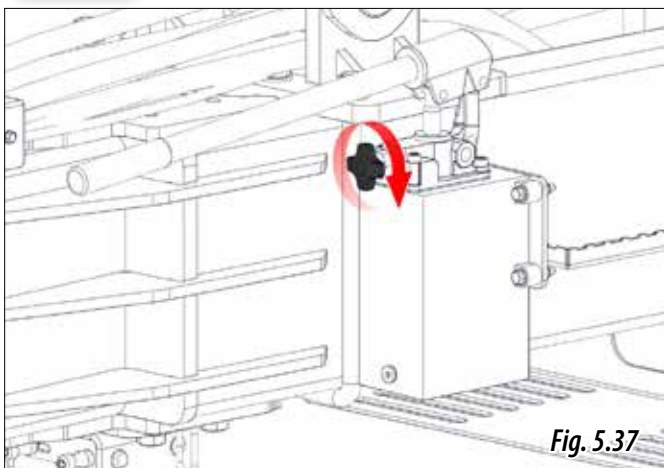


Fig. 5.37

To **RAISE** the support foot you must:



IMPORTANT: WITH THE MACHINE HITCHED TO THE TRACTOR.

- 1- Loosen the hand pump's knob (Fig. 5.38) to raise the telescopic foot. When the foot is raised, tighten the knob again.
- 2- Release the locks (Fig. 5.39) and raise the support foot until the locks are engaged again.

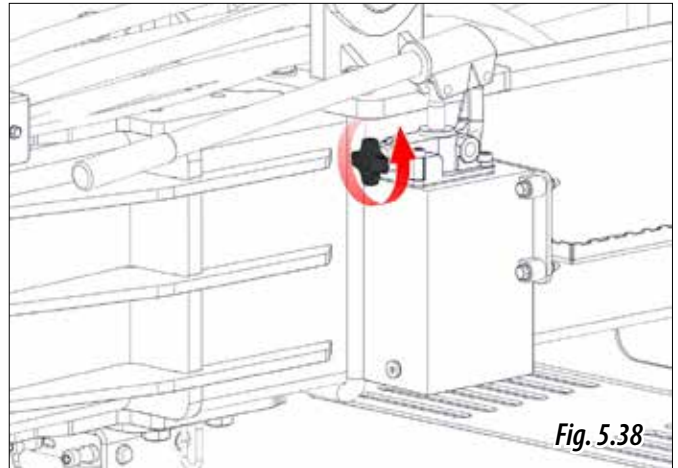


Fig. 5.38

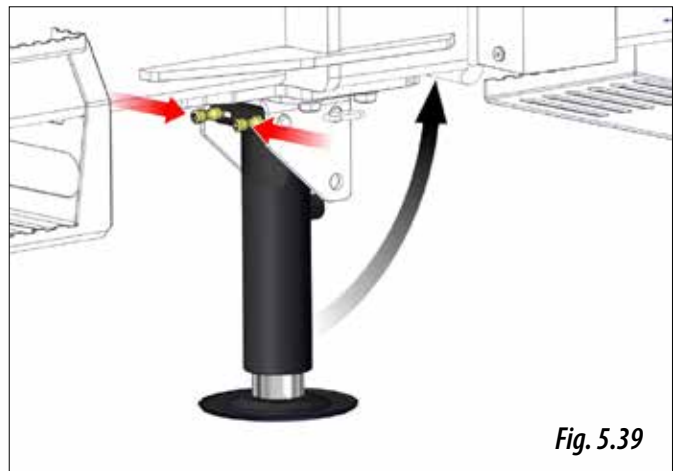


Fig. 5.39

5.6.2 SOWING EQUIPMENT SUPPORT FEET

5.7 PARKING

The support feet are located on the sowing equipment. To **RAISE** or **LOWER** the support feet you must:

- 1- Raise the sowing units.
- 2- Remove the clip and pin (Fig. 5.40) to release the foot.
- 3- Move the support foot to the desired position (Fig. 5.41).
- 4- Install the pin and clip (Fig. 5.42).

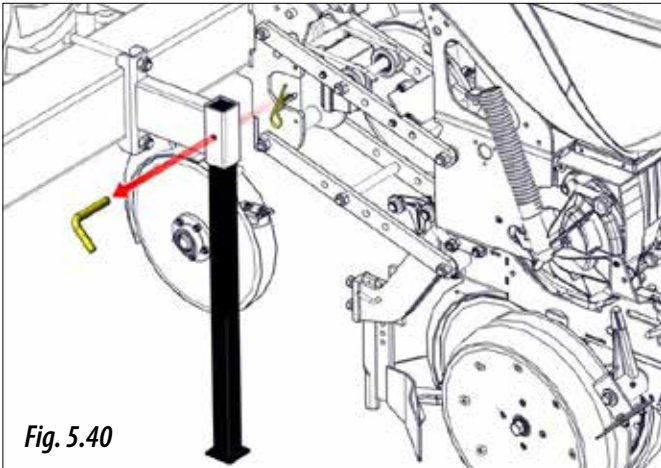


Fig. 5.40

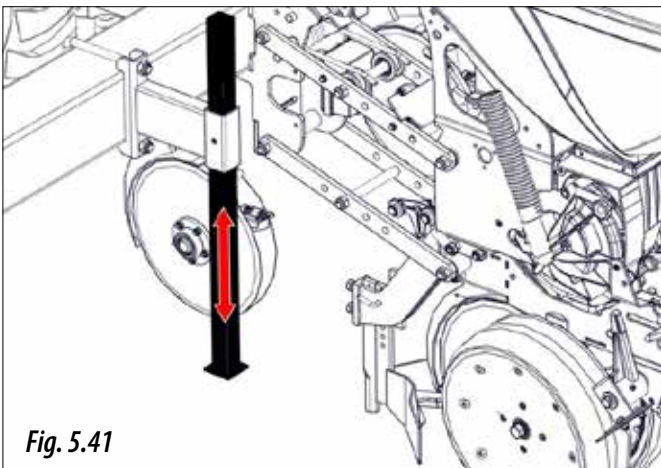


Fig. 5.41

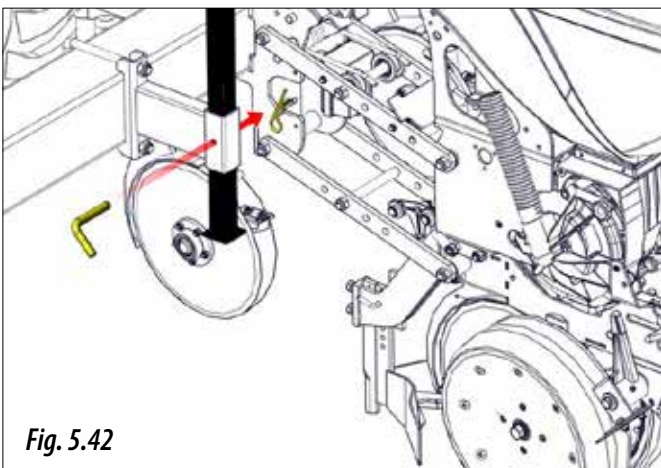


Fig. 5.42



Fig. 5.43



Fig. 5.44



IMPORTANT: IF THE PLANTER IS NOT UNHITCHED FROM THE TRACTOR AND THEY ARE BOTH PARKED ON A SLOPE, YOU MUST ALSO INSTALL CHOCKS.



IMPORTANT: RAISE ALL OF THE REAR SUPPORT FEET WITH THE SOWING EQUIPMENT RAISED ABOVE THE GROUND. ALL OF THE SUPPORT FEET MUST BE RAISED IN WORKING CONDITIONS.

5.8 AFTER WORKING WITH THE MACHINE

- Completely drain all of the seeds and fertiliser from the hoppers.
- Clean the machine with pressurised air, especially the tanks in which chemicals have been used.
- Check that all of the machine's components are in a good condition. Replace any components that need to be replaced due to wear and tear.
- Remove any particles that may cause corrosion. If necessary, protect those areas with paint, varnish or lubricants.
- Grease and lubricate the parts specified below: chains and transmission gears.

6. PLANTER MODEL ADJUSTMENTS

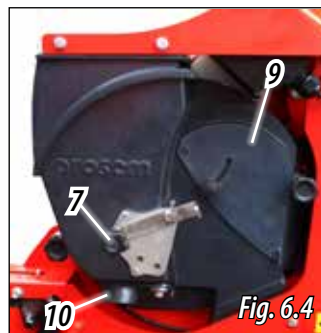
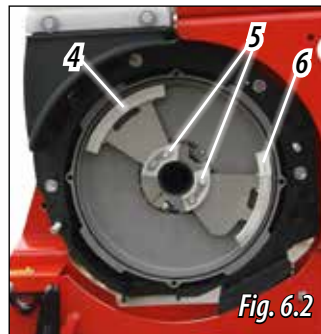
This chapter shows the adjustments to be performed to the planter **ARGO PROSEM** in order to adjust it to the type of seed and terrain properties.

Values shown in this manual could be different depending on the terrain conditions, weather factors or the condition of the machine.

Single-seed dosing system in the metering units has been designed to select the seeds individually, so that they are placed in the furrow keeping a distance between seeds set previously by the user.

Main parts of the metering box:

1. Seed selector: selects a single seed for each seed disc's hole (Fig. 6.1).
2. Seed disc: distributes the seeds (Fig. 6.1).
3. Seed ejector: helps the seed to fall in the right direction (Fig. 6.1).
4. Counter-selector slide: prevents the selector from breaking its tip because of a seed (Fig. 6.2).
5. Central slides (Fig. 6.2).
6. Seed falling slide: it turns off the suction when the seed needs to be detached from the seed disc (Fig. 6.2).
7. The distributor's seed inlet lever controls the amount of seed entering the distributor (Fig. 6.4).
8. Brushes: they clean seed residue from the seed disc (Fig. 6.3).



9. Inspection gate: it allows you to see inside the metering box when the machine is running to perform the required adjustments (Fig. 6.4).

10. Emptying gate: it empties the seed hopper (Fig. 6.4).

11. Seed selector adjuster (Fig. 6.5).



You must use the most suitable seed disc (2, Fig. 6.1) for each type of seed, as the size of the seed, distance between plants, etc. require specific discs with a specific number of holes to control the distances at which the seeds are deposited; additionally, there must be sufficient space between the holes for a single seed to be placed in each hole on the disc.



IMPORTANT: TO PLANT VERY SMALL OR VERY LARGE SEEDS, YOU MUST INSTALL OPTIONAL EQUIPMENT ON THE SOWING UNITS' DISTRIBUTORS. CONTACT YOUR DEALER FOR ADVICE IN SUCH CASES.

Type of SEED DISCS depending on the type of seed:



BEFORE STARTING TO SOW, CHECK THAT THE TYPE OF SEED DISCS ASSEMBLED IN THE METERING BOXES MATCHES THE TYPE OF SEED TO BE USED.



IF THE CASE OF USING NON-MANUAL SPECIFIED SEEDS IN THE SEED DISCS, TAKE INTO ACCOUNT THAT WHEN THE HOLE IS BIGGER THAN EACH SEED, THESE SEEDS MAY BE ABSORBED BY THE SUCTION SYSTEM AND THEREFORE WILL NOT REACH THE FURROW BED.

TYPE OF SEED	Nº OF HOLES	HOLE'S DIAMETRE (mm)															
		0.8	1	1.1	1.2	1.5	2	2.5	3	3.5	4	4.25	4.3	4.5	5	5.5	6.5
SUNFLOWER	10				●		●	●									
	20				●	●	●	●									
	30							●									
CORN	10													●			
	20												●	●			
	30										●	●		●	●		
	40										●			●			
SORGHUM	70						●		●								
	100						●										
COTTON	70								●	●							
	100			●					●	●							
RAPE	40			●													
	70			●													
	100			●													
	120			●			●										
SUGAR BEET	20						●										
	30						●								●		
	40						●										
BEANS	20																●
	70								●								
FABES (ASTURIAN BEANS)	20																●
BROAD BEAN	30																●
TOMATO	30	●	●	●													
	70		●														
LEEK	40									●							
GREEN BEANS	40													●		●	
CHICK PEAS	40															●	
	50													●		●	
	60													●			
	70											●			●		
FRIJOLE (MEXICAN BEAN)	50							●					●	●			
ROUND GREEN BEANS	60	●															
CAULIFLOWER	70	●															
SOYA BEANS	60											●					
	70										●	●					
	80										●		●				
	90										●						
	100										●						
	120												●				
140												●					
CARROTS	70	●															
PUMPKIN	10													●			

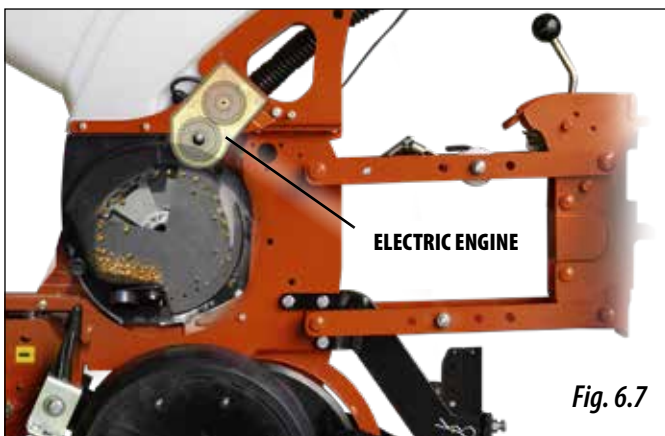
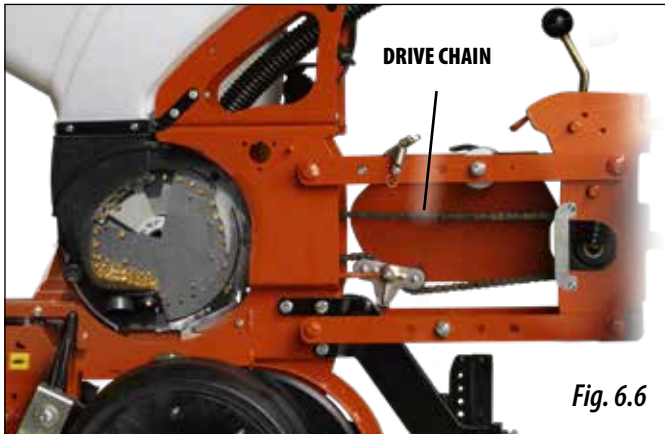
● Standard seed disc

● Optional seed disc

6.1 PLANTING DISTANCE BETWEEN SEEDS

Depending on the model of the machine, the sowing units may have:

- 1- MECHANICAL TRANSMISSION (Fig. 6.1).
- 2- ISOBUS ELECTRICAL TRANSMISSION (Fig. 6.2).



6.1.1 MECHANICAL TRANSMISSION

To adjust planting distance in each row and therefore the plant population per hectare to be planted, the transmission ratio of the machine needs to be adjusted. For this purpose, the machine is provided with two gearbox.

The total plant population (number of plants per hectare) depends on the machine's row spacing and the planting distance, see the following tables.

TABLE OF SEEDS PER HECTARE													
Row spacing (cm)	35	37.5	40	45	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE												
2.0	1,428,600	1,333,300	1,250,000	1,111,100	1,000,000	909,100	833,300	769,200	714,300	666,700	625,000	555,600	526,300
2.3	1,242,200	1,159,400	1,087,000	966,200	869,600	790,500	724,600	668,900	621,100	579,700	543,500	483,100	457,700
2.4	1,190,500	1,111,100	1,041,700	925,900	833,300	757,600	694,400	641,000	595,200	555,600	520,800	463,000	438,600
2.6	1,098,900	1,025,600	961,500	854,700	769,200	699,300	641,000	591,700	549,500	512,800	480,800	427,400	404,900
2.7	1,058,200	987,700	925,900	823,000	740,700	673,400	617,300	569,800	529,100	493,800	463,000	411,500	389,900
2.8	1,020,400	952,400	892,900	793,700	714,300	649,400	595,200	549,500	510,200	476,200	446,400	396,800	375,900
3.0	952,400	888,900	833,300	740,700	666,700	606,100	555,600	512,800	476,200	444,400	416,700	370,400	350,900
3.2	892,900	833,300	781,300	694,400	625,000	568,200	520,800	480,800	446,400	416,700	390,600	347,200	328,900
3.3	865,800	808,100	757,600	673,400	606,100	551,000	505,100	466,200	432,900	404,000	378,800	336,700	319,000
3.4	840,300	784,300	735,300	653,600	588,200	534,800	490,200	452,500	420,200	392,200	367,600	326,800	309,600
3.5	816,300	761,900	714,300	634,900	571,400	519,500	476,200	439,600	408,200	381,000	357,100	317,500	300,800
3.6	793,700	740,700	694,400	617,300	555,600	505,100	463,000	427,400	396,800	370,400	347,200	308,600	292,400
3.7	772,200	720,700	675,700	600,600	540,500	491,400	450,500	415,800	386,100	360,400	337,800	300,300	284,500
3.8	751,900	701,800	657,900	584,800	526,300	478,500	438,600	404,900	375,900	350,900	328,900	292,400	277,000
3.9	732,600	683,800	641,000	569,800	512,800	466,200	427,400	394,500	366,300	341,900	320,500	284,900	269,900
4.0	714,300	666,700	625,000	555,600	500,000	454,500	416,700	384,600	357,100	333,300	312,500	277,800	263,200
4.1	696,900	650,400	609,800	542,000	487,800	443,500	406,500	375,200	348,400	325,200	304,900	271,000	256,700
4.2	680,300	634,900	595,200	529,100	476,200	432,900	396,800	366,300	340,100	317,500	297,600	264,600	250,600
4.3	664,500	620,200	581,400	516,800	465,100	422,800	387,600	357,800	332,200	310,100	290,700	258,400	244,800
4.5	634,900	592,600	555,600	493,800	444,400	404,000	370,400	341,900	317,500	296,300	277,800	246,900	233,900
4.6	621,100	579,700	543,500	483,100	434,800	395,300	362,300	334,400	310,600	289,900	271,700	241,500	228,800
4.7	607,900	567,400	531,900	472,800	425,500	386,800	354,600	327,300	304,000	283,700	266,000	236,400	224,000
4.8	595,200	555,600	520,800	463,000	416,700	378,800	347,200	320,500	297,600	277,800	260,400	231,500	219,300
4.9	583,100	544,200	510,200	453,500	408,200	371,100	340,100	314,000	291,500	272,100	255,100	226,800	214,800
5.0	571,400	533,300	500,000	444,400	400,000	363,600	333,300	307,700	285,700	266,700	250,000	222,200	210,500
5.1	560,200	522,900	490,200	435,700	392,200	356,500	326,800	301,700	280,100	261,400	245,100	217,900	206,400
5.2	549,500	512,800	480,800	427,400	384,600	349,700	320,500	295,900	274,700	256,400	240,400	213,700	202,400
5.3	539,100	503,100	471,700	419,300	377,400	343,100	314,500	290,300	269,500	251,600	235,800	209,600	198,600
5.4	529,100	493,800	463,000	411,500	370,400	336,700	308,600	284,900	264,600	246,900	231,500	205,800	194,900
5.5	519,500	484,800	454,500	404,000	363,600	330,600	303,000	279,700	259,700	242,400	227,300	202,000	191,400
5.6	510,200	476,200	446,400	396,800	357,100	324,700	297,600	274,700	255,100	238,100	223,200	198,400	188,000
5.7	501,300	467,800	438,600	389,900	350,900	319,000	292,400	269,900	250,600	233,900	219,300	194,900	184,700
5.8	492,600	459,800	431,000	383,100	344,800	313,500	287,400	265,300	246,300	229,900	215,500	191,600	181,500
5.9	484,300	452,000	423,700	376,600	339,000	308,200	282,500	260,800	242,100	226,000	211,900	188,300	178,400
6.0	476,200	444,400	416,700	370,400	333,300	303,000	277,800	256,400	238,100	222,200	208,300	185,200	175,400
6.1	468,400	437,200	409,800	364,300	327,900	298,100	273,200	252,200	234,200	218,600	204,900	182,100	172,600

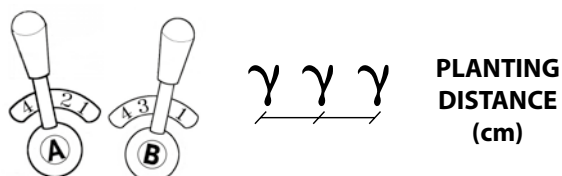
TABLE OF SEEDS PER HECTARE													
Row spacing (cm)	35	37.5	40	45	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE												
6.2	460,800	430,100	403,200	358,400	322,600	293,300	268,800	248,100	230,400	215,100	201,600	179,200	169,800
6.3	453,500	423,300	396,800	352,700	317,500	288,600	264,600	244,200	226,800	211,600	198,400	176,400	167,100
6.4	446,400	416,700	390,600	347,200	312,500	284,100	260,400	240,400	223,200	208,300	195,300	173,600	164,500
6.5	439,600	410,300	384,600	341,900	307,700	279,700	256,400	236,700	219,800	205,100	192,300	170,900	161,900
6.6	432,900	404,000	378,800	336,700	303,000	275,500	252,500	233,100	216,500	202,000	189,400	168,400	159,500
6.7	426,400	398,000	373,100	331,700	298,500	271,400	248,800	229,600	213,200	199,000	186,600	165,800	157,100
6.8	420,200	392,200	367,600	326,800	294,100	267,400	245,100	226,200	210,100	196,100	183,800	163,400	154,800
6.9	414,100	386,500	362,300	322,100	289,900	263,500	241,500	223,000	207,000	193,200	181,200	161,000	152,600
7.0	408,200	381,000	357,100	317,500	285,700	259,700	238,100	219,800	204,100	190,500	178,600	158,700	150,400
7.1	402,400	375,600	352,100	313,000	281,700	256,100	234,700	216,700	201,200	187,800	176,100	156,500	148,300
7.2	396,800	370,400	347,200	308,600	277,800	252,500	231,500	213,700	198,400	185,200	173,600	154,300	146,200
7.3	391,400	365,300	342,500	304,400	274,000	249,100	228,300	210,700	195,700	182,600	171,200	152,200	144,200
7.4	386,100	360,400	337,800	300,300	270,300	245,700	225,200	207,900	193,100	180,200	168,900	150,200	142,200
7.5	381,000	355,600	333,300	296,300	266,700	242,400	222,200	205,100	190,500	177,800	166,700	148,100	140,400
7.6	375,900	350,900	328,900	292,400	263,200	239,200	219,300	202,400	188,000	175,400	164,500	146,200	138,500
7.8	366,300	341,900	320,500	284,900	256,400	233,100	213,700	197,200	183,200	170,900	160,300	142,500	135,000
7.9	361,700	337,600	316,500	281,300	253,200	230,100	211,000	194,700	180,800	168,800	158,200	140,600	133,200
8.0	357,100	333,300	312,500	277,800	250,000	227,300	208,300	192,300	178,600	166,700	156,300	138,900	131,600
8.1	352,700	329,200	308,600	274,300	246,900	224,500	205,800	189,900	176,400	164,600	154,300	137,200	130,000
8.2	348,400	325,200	304,900	271,000	243,900	221,700	203,300	187,600	174,200	162,600	152,400	135,500	128,400
8.3	344,200	321,300	301,200	267,700	241,000	219,100	200,800	185,400	172,100	160,600	150,600	133,900	126,800
8.5	336,100	313,700	294,100	261,400	235,300	213,900	196,100	181,000	168,100	156,900	147,100	130,700	123,800
8.6	332,200	310,100	290,700	258,400	232,600	211,400	193,800	178,900	166,100	155,000	145,300	129,200	122,400
8.7	328,400	306,500	287,400	255,400	229,900	209,000	191,600	176,800	164,200	153,300	143,700	127,700	121,000
8.9	321,000	299,600	280,900	249,700	224,700	204,300	187,300	172,900	160,500	149,800	140,400	124,800	118,300
9.0	317,500	296,300	277,800	246,900	222,200	202,000	185,200	170,900	158,700	148,100	138,900	123,500	117,000
9.1	314,000	293,000	274,700	244,200	219,800	199,800	183,200	169,100	157,000	146,500	137,400	122,100	115,700
9.2	310,600	289,900	271,700	241,500	217,400	197,600	181,200	167,200	155,300	144,900	135,900	120,800	114,400
9.3	307,200	286,700	268,800	238,900	215,100	195,500	179,200	165,400	153,600	143,400	134,400	119,500	113,200
9.4	304,000	283,700	266,000	236,400	212,800	193,400	177,300	163,700	152,000	141,800	133,000	118,200	112,000
9.5	300,800	280,700	263,200	233,900	210,500	191,400	175,400	161,900	150,400	140,400	131,600	117,000	110,800
9.7	294,600	274,900	257,700	229,100	206,200	187,400	171,800	158,600	147,300	137,500	128,900	114,500	108,500
9.9	288,600	269,400	252,500	224,500	202,000	183,700	168,400	155,400	144,300	134,700	126,300	112,200	106,300
10.0	285,700	266,700	250,000	222,200	200,000	181,800	166,700	153,800	142,900	133,300	125,000	111,100	105,300
10.2	280,100	261,400	245,100	217,900	196,100	178,300	163,400	150,800	140,100	130,700	122,500	108,900	103,200
10.3	277,400	258,900	242,700	215,700	194,200	176,500	161,800	149,400	138,700	129,400	121,400	107,900	102,200

TABLE OF SEEDS PER HECTARE													
Row spacing (cm)	35	37.5	40	45	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE												
10.4	274,700	256,400	240,400	213,700	192,300	174,800	160,300	147,900	137,400	128,200	120,200	106,800	101,200
10.5	272,100	254,000	238,100	211,600	190,500	173,200	158,700	146,500	136,100	127,000	119,000	105,800	100,300
10.6	269,500	251,600	235,800	209,600	188,700	171,500	157,200	145,100	134,800	125,800	117,900	104,800	99,300
10.7	267,000	249,200	233,600	207,700	186,900	169,900	155,800	143,800	133,500	124,600	116,800	103,800	98,400
10.8	264,600	246,900	231,500	205,800	185,200	168,400	154,300	142,500	132,300	123,500	115,700	102,900	97,500
10.9	262,100	244,600	229,400	203,900	183,500	166,800	152,900	141,100	131,100	122,300	114,700	101,900	96,600
11.0	259,700	242,400	227,300	202,000	181,800	165,300	151,500	139,900	129,900	121,200	113,600	101,000	95,700
11.1	257,400	240,200	225,200	200,200	180,200	163,800	150,200	138,600	128,700	120,100	112,600	100,100	94,800
11.4	250,600	233,900	219,300	194,900	175,400	159,500	146,200	135,000	125,300	117,000	109,600	97,500	92,300
11.6	246,300	229,900	215,500	191,600	172,400	156,700	143,700	132,600	123,200	114,900	107,800	95,800	90,700
11.7	244,200	227,900	213,700	189,900	170,900	155,400	142,500	131,500	122,100	114,000	106,800	95,000	90,000
11.8	242,100	226,000	211,900	188,300	169,500	154,100	141,200	130,400	121,100	113,000	105,900	94,200	89,200
12.0	238,100	222,200	208,300	185,200	166,700	151,500	138,900	128,200	119,000	111,100	104,200	92,600	87,700
12.1	236,100	220,400	206,600	183,700	165,300	150,300	137,700	127,100	118,100	110,200	103,300	91,800	87,000
12.2	234,200	218,600	204,900	182,100	163,900	149,000	136,600	126,100	117,100	109,300	102,500	91,100	86,300
12.4	230,400	215,100	201,600	179,200	161,300	146,600	134,400	124,100	115,200	107,500	100,800	89,600	84,900
12.5	228,600	213,300	200,000	177,800	160,000	145,500	133,300	123,100	114,300	106,700	100,000	88,900	84,200
12.7	225,000	210,000	196,900	175,000	157,500	143,200	131,200	121,100	112,500	105,000	98,400	87,500	82,900
12.9	221,500	206,700	193,800	172,300	155,000	140,900	129,200	119,300	110,700	103,400	96,900	86,100	81,600
13.0	219,800	205,100	192,300	170,900	153,800	139,900	128,200	118,300	109,900	102,600	96,200	85,500	81,000
13.2	216,500	202,000	189,400	168,400	151,500	137,700	126,300	116,600	108,200	101,000	94,700	84,200	79,700
13.4	213,200	199,000	186,600	165,800	149,300	135,700	124,400	114,800	106,600	99,500	93,300	82,900	78,600
13.6	210,100	196,100	183,800	163,400	147,100	133,700	122,500	113,100	105,000	98,000	91,900	81,700	77,400
13.8	207,000	193,200	181,200	161,000	144,900	131,800	120,800	111,500	103,500	96,600	90,600	80,500	76,300
13.9	205,500	191,800	179,900	159,900	143,900	130,800	119,900	110,700	102,800	95,900	89,900	79,900	75,700
14.1	202,600	189,100	177,300	157,600	141,800	128,900	118,200	109,100	101,300	94,600	88,700	78,800	74,700
14.3	199,800	186,500	174,800	155,400	139,900	127,100	116,600	107,600	99,900	93,200	87,400	77,700	73,600
14.4	198,400	185,200	173,600	154,300	138,900	126,300	115,700	106,800	99,200	92,600	86,800	77,200	73,100
14.5	197,000	183,900	172,400	153,300	137,900	125,400	114,900	106,100	98,500	92,000	86,200	76,600	72,600
14.6	195,700	182,600	171,200	152,200	137,000	124,500	114,200	105,400	97,800	91,300	85,600	76,100	72,100
14.7	194,400	181,400	170,100	151,200	136,100	123,700	113,400	104,700	97,200	90,700	85,000	75,600	71,600
14.9	191,800	179,000	167,800	149,100	134,200	122,000	111,900	103,300	95,900	89,500	83,900	74,600	70,600
15.0	190,500	177,800	166,700	148,100	133,300	121,200	111,100	102,600	95,200	88,900	83,300	74,100	70,200
15.6	183,200	170,900	160,300	142,500	128,200	116,600	106,800	98,600	91,600	85,500	80,100	71,200	67,500
15.7	182,000	169,900	159,200	141,500	127,400	115,800	106,200	98,000	91,000	84,900	79,600	70,800	67,000
16.1	177,500	165,600	155,300	138,000	124,200	112,900	103,500	95,600	88,700	82,800	77,600	69,000	65,400

TABLE OF SEEDS PER HECTARE													
Row spacing (cm)	35	37.5	40	45	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE												
16.2	176,400	164,600	154,300	137,200	123,500	112,200	102,900	95,000	88,200	82,300	77,200	68,600	65,000
16.3	175,300	163,600	153,400	136,300	122,700	111,500	102,200	94,400	87,600	81,800	76,700	68,200	64,600
16.5	173,200	161,600	151,500	134,700	121,200	110,200	101,000	93,200	86,600	80,800	75,800	67,300	63,800
17.1	167,100	155,900	146,200	130,000	117,000	106,300	97,500	90,000	83,500	78,000	73,100	65,000	61,600
17.4	164,200	153,300	143,700	127,700	114,900	104,500	95,800	88,400	82,100	76,600	71,800	63,900	60,500
18.0	158,700	148,100	138,900	123,500	111,100	101,000	92,600	85,500	79,400	74,100	69,400	61,700	58,500
18.1	157,900	147,300	138,100	122,800	110,500	100,500	92,100	85,000	78,900	73,700	69,100	61,400	58,200
18.2	157,000	146,500	137,400	122,100	109,900	99,900	91,600	84,500	78,500	73,300	68,700	61,100	57,800
18.3	156,100	145,700	136,600	121,400	109,300	99,400	91,100	84,100	78,100	72,900	68,300	60,700	57,500
18.6	153,600	143,400	134,400	119,500	107,500	97,800	89,600	82,700	76,800	71,700	67,200	59,700	56,600
19.0	150,400	140,400	131,600	117,000	105,300	95,700	87,700	81,000	75,200	70,200	65,800	58,500	55,400
19.3	148,000	138,200	129,500	115,100	103,600	94,200	86,400	79,700	74,000	69,100	64,800	57,600	54,500
19.4	147,300	137,500	128,900	114,500	103,100	93,700	85,900	79,300	73,600	68,700	64,400	57,300	54,300
20.0	142,900	133,300	125,000	111,100	100,000	90,900	83,300	76,900	71,400	66,700	62,500	55,600	52,600
20.4	140,100	130,700	122,500	108,900	98,000	89,100	81,700	75,400	70,000	65,400	61,300	54,500	51,600
20.8	137,400	128,200	120,200	106,800	96,200	87,400	80,100	74,000	68,700	64,100	60,100	53,400	50,600
21.1	135,400	126,400	118,500	105,300	94,800	86,200	79,000	72,900	67,700	63,200	59,200	52,700	49,900
21.4	133,500	124,600	116,800	103,800	93,500	85,000	77,900	71,900	66,800	62,300	58,400	51,900	49,200
21.7	131,700	122,900	115,200	102,400	92,200	83,800	76,800	70,900	65,800	61,400	57,600	51,200	48,500
21.9	130,500	121,800	114,200	101,500	91,300	83,000	76,100	70,200	65,200	60,900	57,100	50,700	48,100
22.3	128,100	119,600	112,100	99,700	89,700	81,500	74,700	69,000	64,100	59,800	56,100	49,800	47,200
23.1	123,700	115,400	108,200	96,200	86,600	78,700	72,200	66,600	61,800	57,700	54,100	48,100	45,600
23.5	121,600	113,500	106,400	94,600	85,100	77,400	70,900	65,500	60,800	56,700	53,200	47,300	44,800
23.6	121,100	113,000	105,900	94,200	84,700	77,000	70,600	65,200	60,500	56,500	53,000	47,100	44,600
24.0	119,000	111,100	104,200	92,600	83,300	75,800	69,400	64,100	59,500	55,600	52,100	46,300	43,900
24.3	117,600	109,700	102,900	91,400	82,300	74,800	68,600	63,300	58,800	54,900	51,400	45,700	43,300
24.4	117,100	109,300	102,500	91,100	82,000	74,500	68,300	63,100	58,500	54,600	51,200	45,500	43,100
24.7	115,700	108,000	101,200	90,000	81,000	73,600	67,500	62,300	57,800	54,000	50,600	45,000	42,600
25.7	111,200	103,800	97,300	86,500	77,800	70,700	64,900	59,900	55,600	51,900	48,600	43,200	41,000
26.1	109,500	102,200	95,800	85,100	76,600	69,700	63,900	58,900	54,700	51,100	47,900	42,600	40,300
27.1	105,400	98,400	92,300	82,000	73,800	67,100	61,500	56,800	52,700	49,200	46,100	41,000	38,800
27.5	103,900	97,000	90,900	80,800	72,700	66,100	60,600	55,900	51,900	48,500	45,500	40,400	38,300
27.9	102,400	95,600	89,600	79,600	71,700	65,200	59,700	55,100	51,200	47,800	44,800	39,800	37,700
29.0	98,500	92,000	86,200	76,600	69,000	62,700	57,500	53,100	49,300	46,000	43,100	38,300	36,300
29.1	98,200	91,600	85,900	76,400	68,700	62,500	57,300	52,900	49,100	45,800	43,000	38,200	36,200
30.0	95,200	88,900	83,300	74,100	66,700	60,600	55,600	51,300	47,600	44,400	41,700	37,000	35,100

TABLE OF SEEDS PER HECTARE													
Row spacing (cm)	35	37.5	40	45	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE												
31.2	91,600	85,500	80,100	71,200	64,100	58,300	53,400	49,300	45,800	42,700	40,100	35,600	33,700
31.4	91,000	84,900	79,600	70,800	63,700	57,900	53,100	49,000	45,500	42,500	39,800	35,400	33,500
32.1	89,000	83,100	77,900	69,200	62,300	56,600	51,900	47,900	44,500	41,500	38,900	34,600	32,800
32.4	88,200	82,300	77,200	68,600	61,700	56,100	51,400	47,500	44,100	41,200	38,600	34,300	32,500
32.6	87,600	81,800	76,700	68,200	61,300	55,800	51,100	47,200	43,800	40,900	38,300	34,100	32,300
32.9	86,800	81,100	76,000	67,500	60,800	55,300	50,700	46,800	43,400	40,500	38,000	33,800	32,000
34.2	83,500	78,000	73,100	65,000	58,500	53,200	48,700	45,000	41,800	39,000	36,500	32,500	30,800
34.7	82,300	76,800	72,000	64,000	57,600	52,400	48,000	44,300	41,200	38,400	36,000	32,000	30,300
36.0	79,400	74,100	69,400	61,700	55,600	50,500	46,300	42,700	39,700	37,000	34,700	30,900	29,200
36.1	79,100	73,900	69,300	61,600	55,400	50,400	46,200	42,600	39,600	36,900	34,600	30,800	29,200
36.4	78,500	73,300	68,700	61,100	54,900	50,000	45,800	42,300	39,200	36,600	34,300	30,500	28,900
36.6	78,100	72,900	68,300	60,700	54,600	49,700	45,500	42,000	39,000	36,400	34,200	30,400	28,800
37.1	77,000	71,900	67,400	59,900	53,900	49,000	44,900	41,500	38,500	35,900	33,700	29,900	28,400
38.0	75,200	70,200	65,800	58,500	52,600	47,800	43,900	40,500	37,600	35,100	32,900	29,200	27,700
40.1	71,300	66,500	62,300	55,400	49,900	45,300	41,600	38,400	35,600	33,300	31,200	27,700	26,300
40.7	70,200	65,500	61,400	54,600	49,100	44,700	41,000	37,800	35,100	32,800	30,700	27,300	25,900
42.3	67,500	63,000	59,100	52,500	47,300	43,000	39,400	36,400	33,800	31,500	29,600	26,300	24,900
42.9	66,600	62,200	58,300	51,800	46,600	42,400	38,900	35,900	33,300	31,100	29,100	25,900	24,500
44.6	64,100	59,800	56,100	49,800	44,800	40,800	37,400	34,500	32,000	29,900	28,000	24,900	23,600
47.0	60,800	56,700	53,200	47,300	42,600	38,700	35,500	32,700	30,400	28,400	26,600	23,600	22,400
48.6	58,800	54,900	51,400	45,700	41,200	37,400	34,300	31,700	29,400	27,400	25,700	22,900	21,700
49.5	57,700	53,900	50,500	44,900	40,400	36,700	33,700	31,100	28,900	26,900	25,300	22,400	21,300
51.4	55,600	51,900	48,600	43,200	38,900	35,400	32,400	29,900	27,800	25,900	24,300	21,600	20,500
52.2	54,700	51,100	47,900	42,600	38,300	34,800	31,900	29,500	27,400	25,500	23,900	21,300	20,200
54.3	52,600	49,100	46,000	40,900	36,800	33,500	30,700	28,300	26,300	24,600	23,000	20,500	19,400
55.0	51,900	48,500	45,500	40,400	36,400	33,100	30,300	28,000	26,000	24,200	22,700	20,200	19,100
58.0	49,300	46,000	43,100	38,300	34,500	31,300	28,700	26,500	24,600	23,000	21,600	19,200	18,100
58.3	49,000	45,700	42,900	38,100	34,300	31,200	28,600	26,400	24,500	22,900	21,400	19,100	18,100
60.0	47,600	44,400	41,700	37,000	33,300	30,300	27,800	25,600	23,800	22,200	20,800	18,500	17,500
62.4	45,800	42,700	40,100	35,600	32,100	29,100	26,700	24,700	22,900	21,400	20,000	17,800	16,900
65.1	43,900	41,000	38,400	34,100	30,700	27,900	25,600	23,600	21,900	20,500	19,200	17,100	16,200
65.8	43,400	40,500	38,000	33,800	30,400	27,600	25,300	23,400	21,700	20,300	19,000	16,900	16,000
69.4	41,200	38,400	36,000	32,000	28,800	26,200	24,000	22,200	20,600	19,200	18,000	16,000	15,200
72.0	39,700	37,000	34,700	30,900	27,800	25,300	23,100	21,400	19,800	18,500	17,400	15,400	14,600
73.3	39,000	36,400	34,100	30,300	27,300	24,800	22,700	21,000	19,500	18,200	17,100	15,200	14,400

This table shows the distances in centimetres that can be applied between seeds according to the number of holes in the seed disc installed on the distributors and the position of the gear levers.



POS.		NUMBER OF HOLES ON THE SEED DISC													
A	B	5	10	20	30	40	50	60	70	80	90	100	110	120	140
1	1	64.8	32.4	16.2	10.8	8.1	6.5	5.4	4.6	4.1	3.6	3.2	2.9	2.7	2.3
1	2	68.3	34.2	17.1	11.4	8.5	6.8	5.7	4.9	4.3	3.8	3.4	3.1	2.8	2.4
1	3	72.1	36.1	18.0	12.0	9.0	7.2	6.0	5.2	4.5	4.0	3.6	3.3	3.0	2.6
1	4	76.1	38.0	19.0	12.7	9.5	7.6	6.3	5.4	4.8	4.2	3.8	3.5	3.2	2.7
2	1	80.1	40.1	20.0	13.4	10.0	8.0	6.7	5.7	5.0	4.5	4.0	3.6	3.3	2.9
2	2	84.5	42.3	21.1	14.1	10.6	8.5	7.0	6.0	5.3	4.7	4.2	3.8	3.5	3.0
2	3	89.1	44.6	22.3	14.9	11.1	8.9	7.4	6.4	5.6	5.0	4.5	4.1	3.7	3.2
2	4	94.0	47.0	23.5	15.7	11.8	9.4	7.8	6.7	5.9	5.2	4.7	4.3	3.9	3.4
3	1	98.9	49.5	24.7	16.5	12.4	9.9	8.2	7.1	6.2	5.5	4.9	4.5	4.1	3.5
3	2	104.3	52.2	26.1	17.4	13.0	10.4	8.7	7.5	6.5	5.8	5.2	4.7	4.3	3.7
3	3	110.1	55.0	27.5	18.3	13.8	11.0	9.2	7.9	6.9	6.1	5.5	5.0	4.6	3.9
3	4	116.1	58.0	29.0	19.3	14.5	11.6	9.7	8.3	7.3	6.4	5.8	5.3	4.8	4.1
4	1	124.8	62.4	31.2	20.8	15.6	12.5	10.4	8.9	7.8	6.9	6.2	5.7	5.2	4.5
4	2	131.7	65.8	32.9	21.9	16.5	13.2	11.0	9.4	8.2	7.3	6.6	6.0	5.5	4.7
4	3	138.9	69.4	34.7	23.1	17.4	13.9	11.6	9.9	8.7	7.7	6.9	6.3	5.8	5.0
4	4	146.5	73.3	36.6	24.4	18.3	14.7	12.2	10.5	9.2	8.1	7.3	6.7	6.1	5.2



BEFORE MODIFYING THE TRANSMISSION RATIO, CHECK THAT THE POSITION OF THE LEVERS IN THE AUTOMATIC GEARBOX IS THE CORRECT ONE FOR THE NUMBER OF HOLES ON THE DISC AND FOR THE PLANTING DISTANCE.



THE PLANTING DISTANCE VALUES ARE THEORETICAL, DEPENDING ON THE CONDITIONS OF THE TERRAIN THEY MAY VARY SLIGHTLY. CARRY OUT A FIELD TEST BEFORE STARTING TO PLANT.

To change the transmission ratio, follow these steps:

- 1- Raise the sowing gear to prevent the drive wheels from coming into contact with the ground.
- 2- Place the lever "A" (fig. 6.8) in the correct position and turn the wheel (C, Fig. 6.8) in the forward direction until the gear clutches in. Alternatively, turn the drive wheel using your foot in the forward direction. Repeat this operation using the lever "B".
- 3- After modifying the transmission, turn the drive wheel in the forward direction and check if the gear output shaft rotates.



IF, AFTER 3 OR 4 WHEEL TURNS, THE GEAR HAS NOT CLUTCHED IN, POSSIBLY THE LEVER IS MISPLACED AND THE POSITION SHOULD BE CORRECTED.



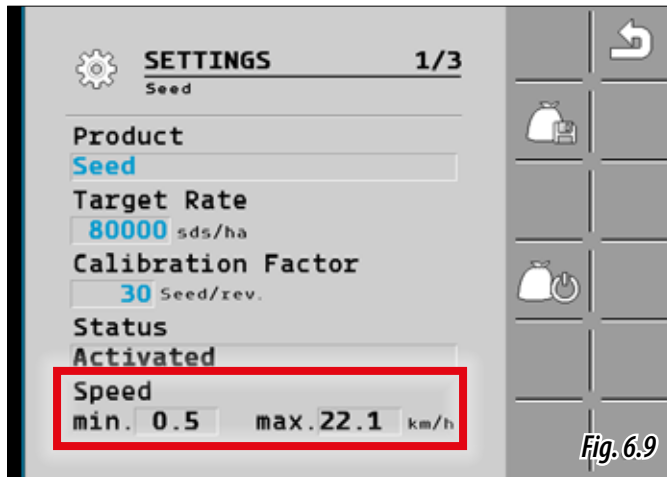
ADJUST THE TRANSMISSION ONLY WHEN THE MACHINE IS IN RAISED POSITION. CHECK THAT THE WHEELS THAT CONTROL THE METERING BOX'S TRANSMISSION ARE IN CONTACT WITH THE GROUND.

6.1.2 ELECTRICAL TRANSMISSION - ISOBUS

You must use the ISOBUS monitor to define the population per hectare being sown (see the ISOBUS manual).

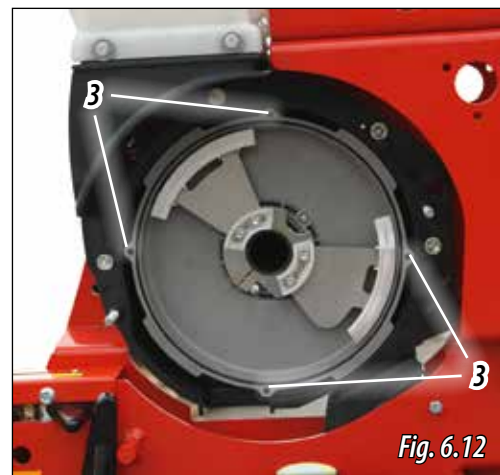
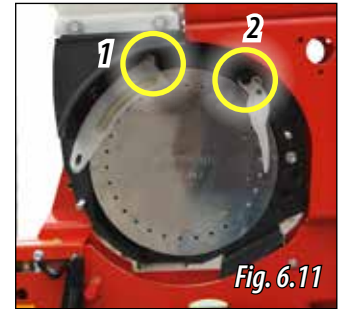
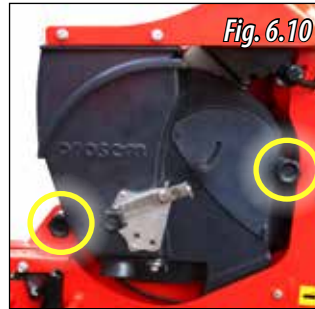


CHECK IF THE WORKING SPEED IS WITHIN THE SPEED RANGE ON THE MONITOR.



6.2 REPLACING SEED DISC

- 1- Loosen the two securing knobs to remove the lid from its original place (Fig. 6.10).
- 2- Pull the seed selector (1, Fig. 6.11) to remove it from the securing groove. Then loosen the knob of the seed ejector in order to remove it (2, Fig. 6.11).



- 3- The seed disc is secured magnetically. Use both hands to pull the disc to remove it. Once it has been removed, the vacuum chamber of the metering box will be visible (Fig. 6.12).
- 4- Place the selected seed disc.



IMPORTANT: INSERT THE DISC'S TRAILER SHAFTS INTO THE HOLES OF THE DISTRIBUTOR'S VACUUM CHAMBER (3, FIG. 6.12)

- 5- Place both the seed selector and the seed ejector back. Use the knob to fix the seed ejector.
- 6- Place the lid back and fix it using the two knobs.

To choose the seed disc that you are going to use, see the seeds per hectare tables for models with mechanical transmission; and for models with electrical transmission and ISOBUS, make sure that the working speed is within the speed range on the monitor.

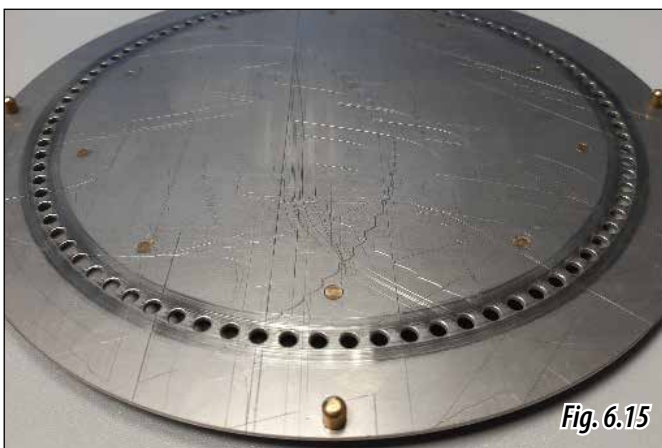


USE ALWAYS THE SUITABLE SEED DISCS FOR EACH TYPE OF SEED.

6.3 FACTORS THAT AFFECT SEED QUALITY

The following adjustments affect directly on the quality of the seed dosing:

1. The selector's position in relation to the disc's holes. It is important to adjust the selector's position depending on the type of seed to be distributed (see section 6.3.1. ADJUSTING THE SELECTOR).
2. The seed ejector's position in relation to the disc's holes. In order to achieve a better seed dosing, the metering box PROSEM is provided with a seed ejector slide (see 6.3.2 ADJUSTING THE SEED EJECTOR).
3. The suction power needs to be adjusted to the weight of the seeds to be planted (see section 6.4 SUCTION SYSTEM – FAN).
4. Distributor seed inlet: the opening must be adjusted according to the type of seed (see section 6.3.3 DISTRIBUTOR SEED INLET).
5. Enough pressure must be delivered to the sowing units to ensure optimal stability and prevent any jolting during work (see section 6.8 UNIT PRESSURE ON THE GROUND).
6. Check for wear on the distributor's components, especially the runners, the ejector and other plastic components (Fig. 6.13 and 6.14). Make sure that the seed disc is not worn or dented (Fig 6.15). Make sure that the seed drop tube is in a perfect condition.
7. Conditions and the condition of the ground.
8. The seeds being used must be dry and regular in shape and size.
9. For even and precise sowing, we recommend working at low speeds.



6.3.1 ADJUSTING THE SELECTOR

The selector's lever can be adjusted from 0 to 10. When the lever is placed at a higher number, the selector is being moved away from the hole and, therefore, the suction power is increased. This causes a tendency towards the emergence of doubles. On the other side, when the lever is placed at a lower number, the selector is being moved closer to the hole and, therefore, the suction power is reduced. This causes a tendency towards the lack of seeds in the disc's hole.

Recommended selector's positions depending on the type of seed to be planted using **standard seed discs**.

TYPE OF SEED	SELECTOR VALUE	
	MINIMUM	MAXIMUM
Sorghum	3.1	3.5
Sunflower	3.0	4.5
Non-pelleted beet	2.6	3.4
Rape	2.8	3.6
Corn	3.5	4.5
Baby corn	3.0	4.0
Soya / peas	4.0	6.0
Pelleted beet	3.1	4.0
Cotton	3.0	4.5
Beans	4.6	5.4
Chickpeas	4.5	7.5
Broad beans*	10.0	10.0

(*) If this is not sufficient, remove the selector



THE SELECTOR'S POSITIONS INDICATED ABOVE ARE APPROXIMATIVE; IT IS ESSENTIAL TO PERFORM TESTS AT THE BEGINNING AND DURING THE SOWING SEASON.

To check that the selector's position is the right one, follow these steps:

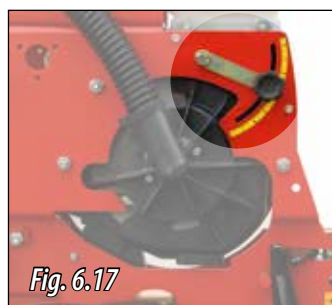
1. Raise the machine from the ground.
2. Use the FAN to pressurize the pneumatic system until the pressure is appropriate (see section 6.4 SUCTION SYSTEM – FAN).

3. Manually turn a drive wheel in the direction of travel or, in the case of models with ISOBUS, rotate the distributors at a simulated speed and then loosen the knob and open the inspection door (Fig. 6.16) to check the seed distribution in the seed disc.
4. Adjust the selector's lever position (Fig. 6.17) depending on the seed distribution inside the disc checked in the previous point. For a correct adjustment, see Fig. 6.18.



ADJUST THE SEED SELECTOR USING THE CORRECT SUCTION POWER LEVELS, AS SHOWN IN THE TABLE OF THE PREVIOUS PAGE (see section 6.4 Suction system – Fan).

5. Close the inspection gates of the metering boxes.



Lack of seed in the disc's holes. INCORRECT			Place the lever at a HIGHER number (for example from 2.8 to 3). If this is not enough, increase the suction pressure .
CORRECT position, one seed per hole			Secure the lever.
Double seeds enter the seed disc. INCORRECT			Place the lever at a LOWER number (for example from 2.8 to 2.6). If this is not enough, reduce the suction pressure .

Fig. 6.18



IMPORTANT: IN CASE THAT THE ADJUSTING VALUES ARE BIGGER OR SMALLER THAN THE ONES IN THE PREVIOUS TABLE AND THE LACK OF SEEDS IN THE DISC PERSISTS, REPLACE THE DISC BY ANOTHER ONE WITH BIGGER HOLES. IN CASE THE EMERGENCE OF DOUBLES PERSISTS, REPLACE THE DISC BY ANOTHER ONE WITH SMALLER HOLES.



THE SEED SELECTOR IS ADJUSTED USING THE LEVER PLACED OUTSIDE THE METERING BOX. FORTHIS REASON IT SHOULD NOT BE ADJUSTED MANUALLY WHEN HANDLING THE INSIDE OF THE METERING BOX. THE SEED SELECTOR SHOULD ONLY BE REMOVED TO PERFORM MAINTENANCE OR CLEANING OPERATIONS, OR TO REPLACE THE SEED DISC

6.3.2 ADJUSTING THE SEED EJECTOR



CAUTION: THE SEED EJECTOR SHOULD BE ADJUSTED BEFORE FILLING THE SEED HOPPER.

The seed ejector places every single seed in the same way on the seed disc's holes and ejects them when they reach the same place. Therefore, they are precisely placed into the furrow bed.

To adjust the seed ejector, follow these steps:

- 1- Remove the two securing knobs of the metering box's lid. (Fig. 6.19).
- 2- Remove the metering box's lid.
- 3- Loosen the slide's securing knob (Fig. 6.20).
- 4- Place the slide at the correct position. For the standard adjusting, place the slide tangent to the exterior of the disc's hole that coincide with the vacuum cut-off line. See the mark on the slide (in red, Fig. 6.21)

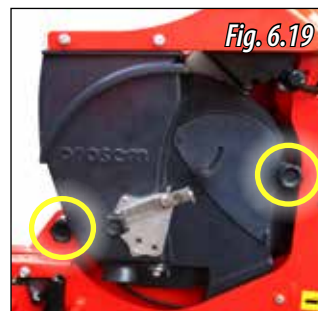


Fig. 6.21

Fig. 6.22

STANDARD POSITION



THE MARK ON THE SLIDE (IN RED, FIG. 6.21) INDICATES THE ADJUSTING POINT IN STEP 4.



WHEN PLANTING PILLED SEEDS, PLACE THE SLIDE SO THAT IT COVERS $\frac{1}{4}$ OF THE HOLE, AS SHOWN IN THE PICTURE (A, FIG. 6.22).



WHEN PLANTING VERY BIG SEEDS, MOVE THE SLIDE AWAY $\frac{1}{4}$ OF THE HOLE, AS SHOWN IN THE PICTURE (B, FIG. 6.22).

6.3.3 SEED'S INLET TO THE METERING BOX

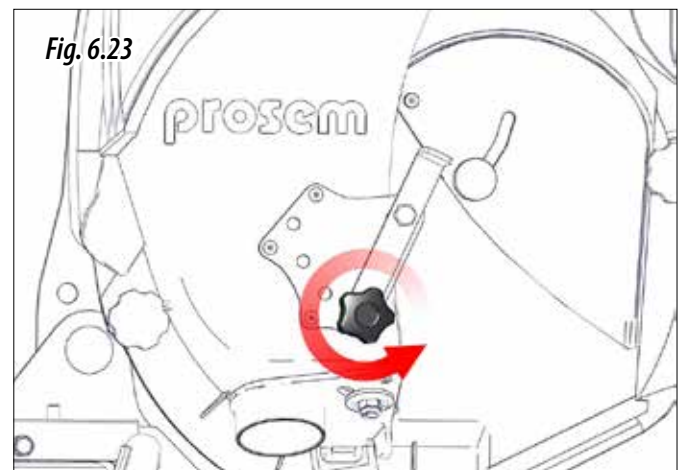
The seed level inside the distributor is controlled using the seed inlet lever located on the distributor cover.



IMPORTANT: THE SEED LEVEL INSIDE THE METERING BOX HAS TO BE THE CORRECT ONE FOR EACH TYPE OF SEED. IF THE LEVEL IS TOO HIGH OR TOO LOW, THE PLANTING DISTANCE IN THE SAME ROW WILL HAVE PRECISION MISTAKES.

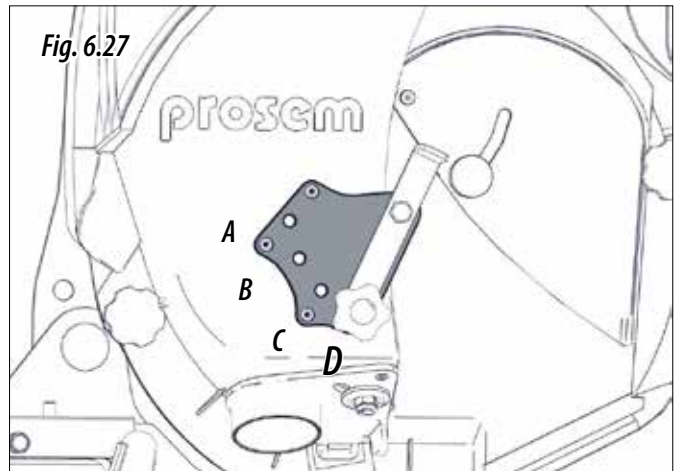
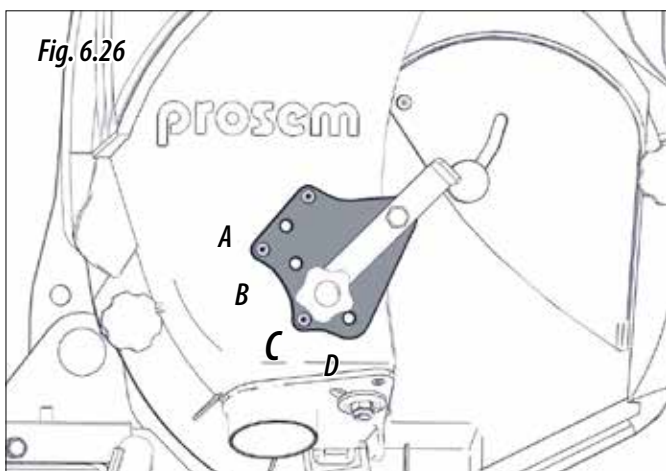
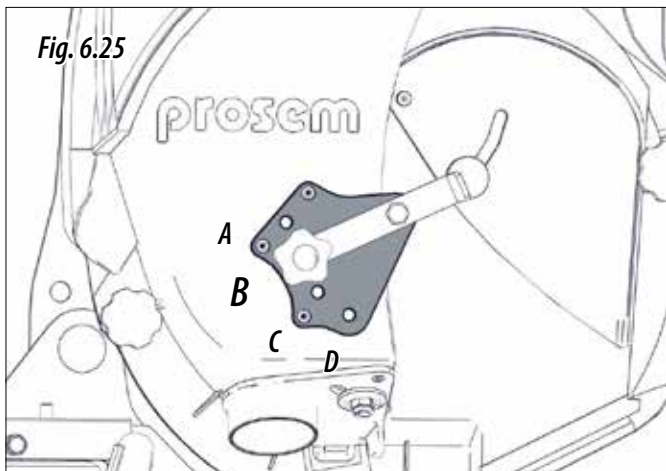
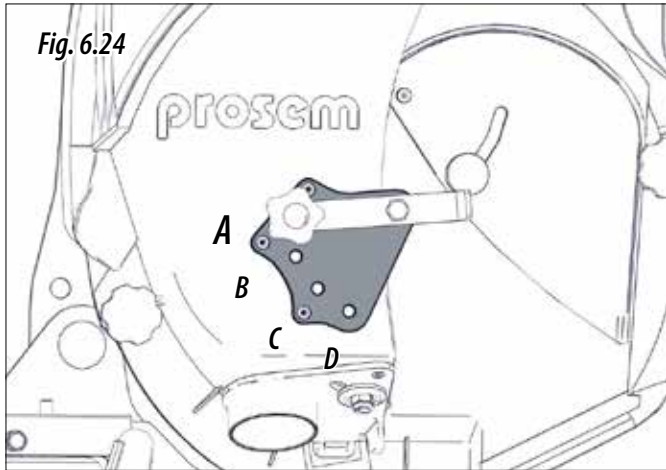
To adjust the opening of the seed entering gate, follow these steps:

1. Remove the metering box's lid by loosening the 2 securing knobs (Fig. 6.23).



2. In the inner part of the metering box's lid, turn the gate in the appropriate direction to open or close the seed flow. Place the gate in the correct position depending on the seed type:

- A- Big seeds (Fig. 6.24), for example corn, soya, chickpeas.
- B- Regular size seeds (Fig. 6.25), for example sunflower.
- C- Small seeds (Fig. 6.26), for example sugar beet, tomato, rape.
- D- **TRANSPORT** position (Fig. 6.27).



3. Tighten the knob to secure the lever.



WHEN USING PILLED SEEDS, FOR EXAMPLE SUGAR BEET, THE TURNING MOVEMENT OF THE SEED DISC ABOVE THE SEED COULD BREAK IT. FOR THIS REASON, IT IS RECOMMENDED TO HAVE THE SMALLEST NUMBER OF SEEDS IN CONTACT WITH THE DISC. FOR THIS PURPOSE, ADJUST THE GATE'S POSITION FOR SMALL SEEDS (FIG. 6.26).

6.4 SUCTION SYSTEM – FAN

The suction system works by means of a fan, which can create the vacuum inside the metering boxes.

The fan's suction power is measured using the vacuum gauge (Fig. 6.28). Depending on the type of seed, it is recommended to adjust the suction power using the next table:

TYPE OF SEED	SUCTION PRESSURE (cm H ₂ O / mbar)									
	20	30	40	50	60	70	80	90	100	
Sunflower										
Corn										
Baby corn										
Sorghum										
Cotton										
Rape										
Beet										
Beans										
Fabes (Asturian beans)										
Broad beans										
Tomato										
Leek										
Green Beans										
Chickpeas										
Frijoles-Mexican beans										
Round green beans										
Cauliflower										
Soya beans										
Carrots										

*The values on the suction pressure table are for standard seed discs and may vary according to the type of seed.



Fig. 6.28



KEEP THE AIR OUTLETS FREE OF OBSTACLES.



SUBMINISTRATE ENOUGH POWER TO THE PNEUMATIC SYSTEM UNTIL REACHING THE MINIMUM SUCTION POWER VALUES SPECIFIED IN THE TABLE. CHECK THE DEPRESSURE VALUES AFTER RUNNING THE FIRST 10 METRES.



IF THE PRESSURE LEVEL IS LOWER THAN THE ONE RECOMMENDED BY THE MANUFACTURER, THE SEED DISC'S HOLES COULD HAVE A LACK OF SEEDS. ON THE OTHER HAND, IF THE PRESSURE IS EXCESSIVE, DOUBLES COULD EMERGE OR THE DISTANCE BETWEEN SEEDS COULD BE IRREGULAR.

6.5 EXCLUDING A METERING UNIT

To exclude a metering unit so that it stops planting, follow these steps:

1- INDIVIDUAL EXCLUSION OF THE TRANSMISSION for each element.

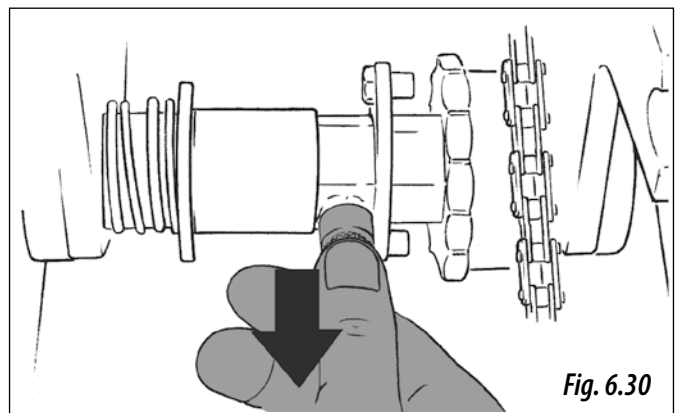
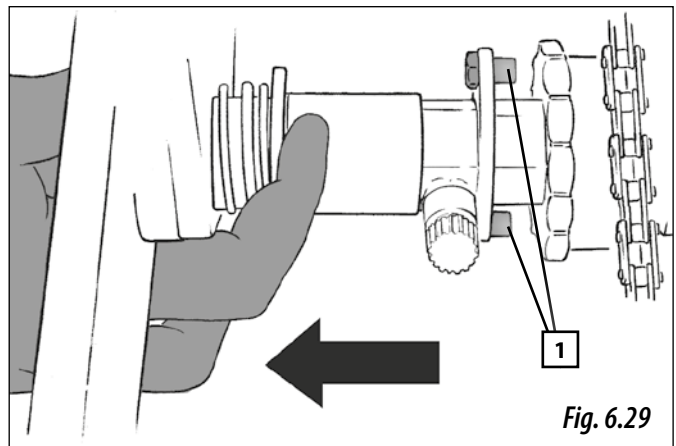
2- RAISE UP THE METERING UNIT.

6.5.1 EXCLUSION OF THE TRANSMISSION

To **ENGAGE/DISABLE THE TRANSMISSION** in models with **ELECTRICAL TRANSMISSION (ISOBUS)**, see the ISOBUS manual.

To **DISABLE THE TRANSMISSION** in models with **MECHANICAL TRANSMISSION**, you must:

1- Shift the clutch by pulling it until the knob gets fixed at the exclusion position (Fig. 6.29).



To **RECONNECT THE TRANSMISSION**:

- 1-** Pull the knob out slightly (Fig. 6.30) and the clutch will return to its transmission position.
- 2-** Check that the screws (Fig. 6.29) have engaged correctly. If not, move the clutch until they engage.

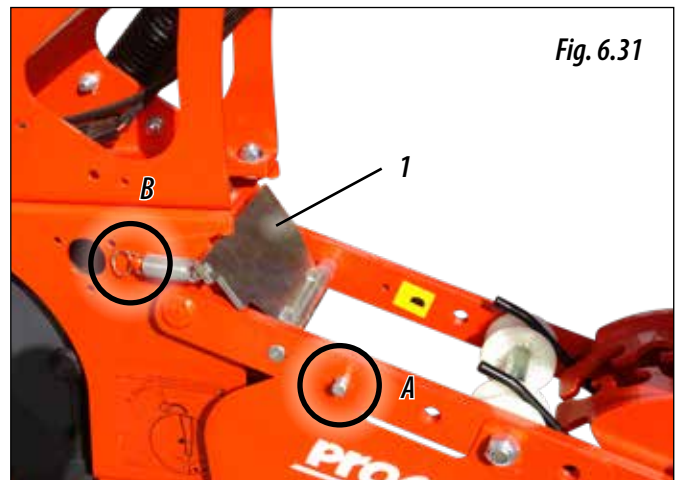


THIS OPERATION MUST ONLY BE PERFORMED WHEN THE PARKING BRAKE IS SET.

6.5.2 RAISING THE UNIT

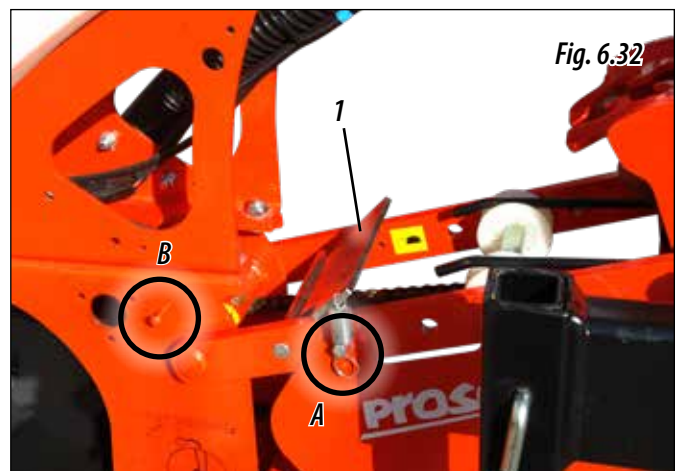
To **RAISE/EXCLUDE THE UNIT:**

- 1- When the planter is in a raised position, couple the SPRING to position B. After performing this operation, the lever (1) will move to the other end (Fig. 6.31).
- 2- Place a wooden block of about 20 cm high under the wheels. This is used for the depth control of each unit to be excluded.
- 3- Lower the planter onto the ground so that the units TO BE EXCLUDED become locked.



To **LOWER/INCLUDE THE UNIT:**

- 1- When the planter is in raised position, couple the SPRING to the position A.
- 2- Place a wood block of about 20 cm high under the wheels. This is used for the depth control of each unit to be included.
- 3- Lower the planter onto the ground in order to INCLUDE the unit (Fig. 6.32).



6.6 PLANTING DEPTH



PERFORM THIS OPERATION TO EACH METERING UNIT AND ONLY WITH THE MACHINE IN RAISED POSITION.



TO SET THE PLANTING DEPTH USE THE GRADUATED SCALE. EACH VALUE OF THE SCALE REFERS TO THE PLANTING DEPTH IN CENTIMETERS. FOR EXAMPLE, IF WE SET 5, PLANTING DEPTH WILL BE 5 CM. WE RECOMMEND NOT TO OVERPASS VALUES OVER 7. IN CASE IS NEEDED, THE "DEEP PLANTING KIT" MUST BE INSTALLED (ASK YOUR DEALER). DEPENDING ON THE FIELD CONDITIONS VALUES MENTIONED ABOVE CAN CHANGE. REAL DEPTH CONTROL TEST MUST BE CARRIED OUT ON THE FIELD BEFORE START PLANTING.



IMPORTANT: WHEN SETTING THE PLANTING DEPTH DO NOT OVERPASS 8 CM VALUE.

To adjust the planting depth of this metering unit, follow these steps:

- 1- Remove the pin (1, Fig. 6.33) to free the crank (2, Fig. 6.33).
- 2- Turn the crank to set the desired planting depth. For this purpose, use the depth indicator (3, Fig. 6.33).
- 3- Once the planting depth has been set, lower the crank (2, Fig. 6.33) and place the pin (1, Fig. 6.33) to fix the planting depth.

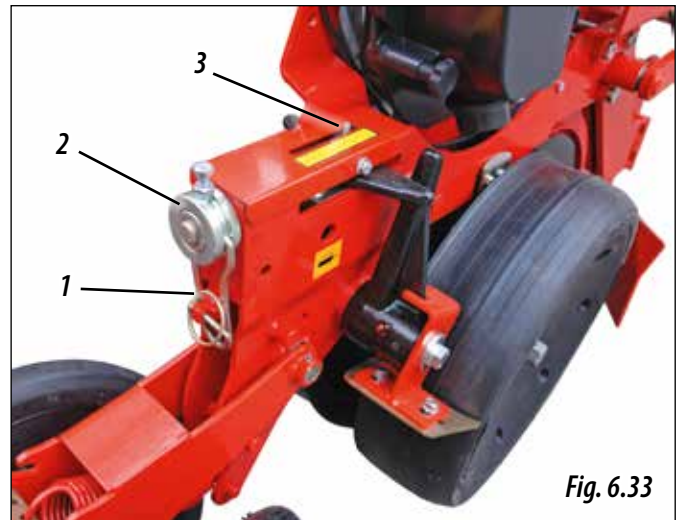


Fig. 6.33

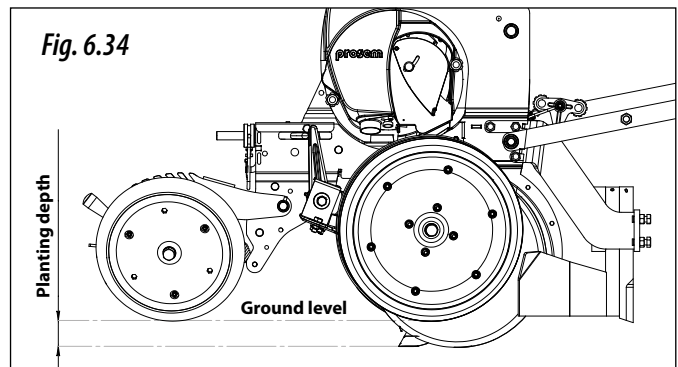
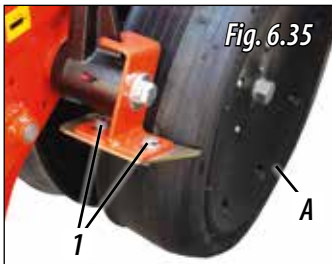


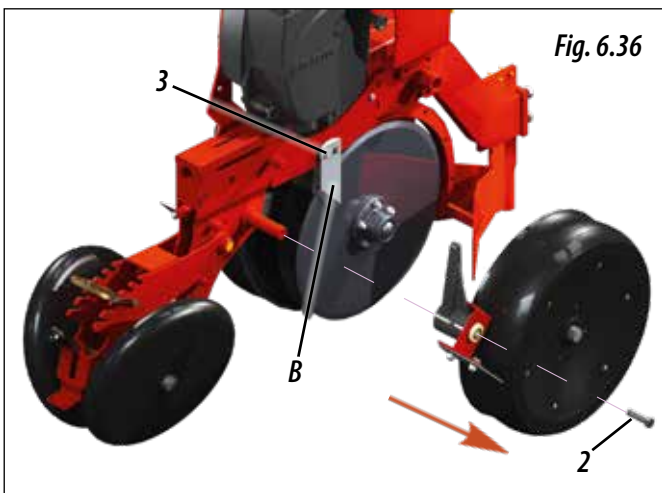
Fig. 6.34

6.7 SCRAPER PROSEM K

Metering unit PROSEM K is equipped with scrapers in:



- Depth adjustment wheels (A, Fig. 6.35).
- Seed discs (B, Fig. 6.36).



To adjust the scrapers of the depth adjustment wheels, operate on the screws (1, Fig. 6.35). They need to be adjusted to be at 3-4 mm away from the wheel.



THE SCRAPER MUST NEVER BE IN CONTACT WITH THE DEPTH CONTROL WHEELS.

Metering unit K is equipped with two seed discs. Each one has two scrapers, one exterior and one interior.

To adjust the seed disc's scrapers, follow these steps:

- 1- Take apart the depth adjustment wheel using the screw (2, Fig. 6.36).
- 2- Loosen the screws (3, Fig. 6.36).
- 3- Place the interior and the exterior scrapers so that they keep a distance of 2 millimeters from the seed disc, without being in contact with it.
- 4- Repeat the former steps to adjust the two scrapers of the seed disc placed on the other side of the metering unit.



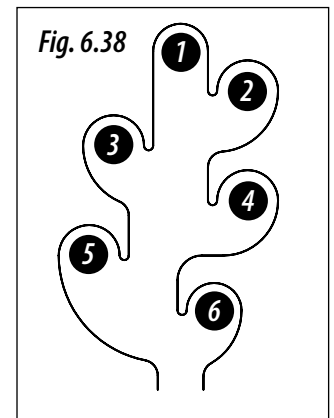
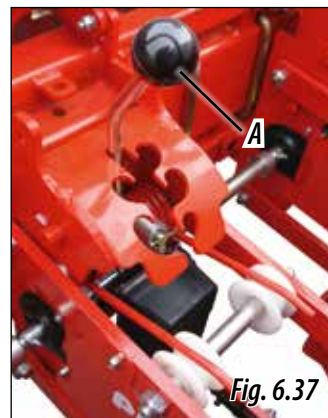
PERFORM THIS OPERATION WITH THE PLANTER IN RAISED POSITION.

6.8 PRESSURE OF THE METERING UNIT ONTO THE GROUND

The pressure device assembled in each metering unit allows to adapt the machine to several kinds of terrain.

The purpose of this device is to increase or decrease the pressure exerted by the unit on the ground, to alter its penetration capacity.

Operate on the lever (A, Fig. 6.37) to modify the pressure of the unit onto the ground. Depending on the lever's position, the pressure exerted by the metering unit will increase or reduce; The following table shows the pressure in Kg for each lever's position (Fig. 6.38).



WHEN CHANGING THE LEVER'S POSITION, HOLD AND MOVE IT TIGHTLY.

POSITION	PRESSURE (kg,)	
	MODEL K	MODEL P
1	103	85
2	109	91
3	115	97
4	123	105
5	131	113
6	139	121

6.9 CLOSING THE FURROWS

Adjusting the way the furrows are closed depends on the type of metering unit assembled on the planter (type K or P).

The function of the seed-covering device PROSEM K is to close and press the furrow created by the unit's seed discs.

The furrow closing wheels admit the following adjustments (Fig. 6.39):

- Working **WIDTH**, depending on the planting depth.
- **PRESSURE** exerted by the wheel onto the terrain.
- **BEARING ANGLE** of both wheels, unless using out-of-phase press wheels, since their bearing angle can not be adjusted.



Fig. 6.39



THE FURROW CLOSING WHEELS NEED TO BE CLEANED PERIODICALLY.



WHEN **THE TERRAIN'S SLOPE IS LATERAL** IN RELATION TO THE FORWARD DIRECTION OF THE MACHINE, IT IS RECOMMENDED TO USE PRESS WHEELS WITH SHORT CONNECTION ROD (FIG. 6.41). OTHERWISE, IF PRESS WHEELS WITH LONG CONNECTION ROD ARE USED (FIG. 6.40), THE SEEDS MAY NOT BE COVERED.



FOR **ROCKY GROUND**, OFFSET COMPACTION WHEELS SHOULD BE USED (FIG. 6.42), THESE ARE DESIGNED TO ENSURE THAT THE ROCKS IN THE FURROW BED DO NOT GET TRAPPED BETWEEN THE TWO WHEELS.



WHEN THE TERRAIN MEETS BOTH PREVIOUS CONDITIONS (**ROCKY TERRAIN WITH LATERAL SLOPE**), IT IS RECOMMENDED TO USE OUT-OF-PHASE PRESS WHEELS WITH SHORT CONNECTION ROD. (FIG. 6.43)

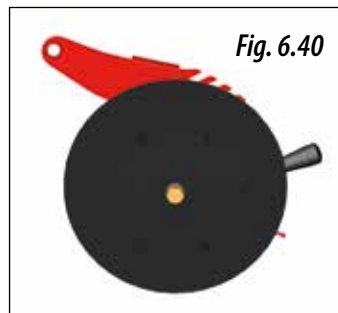


Fig. 6.40

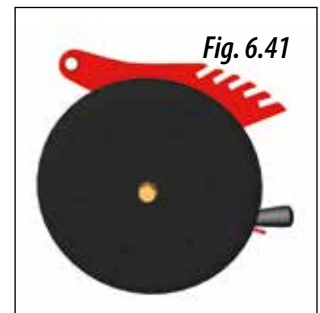


Fig. 6.41

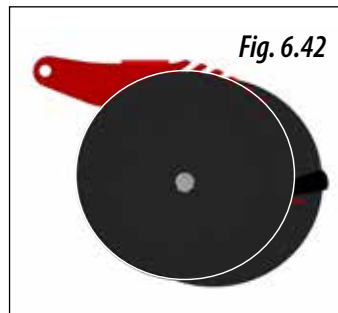


Fig. 6.42

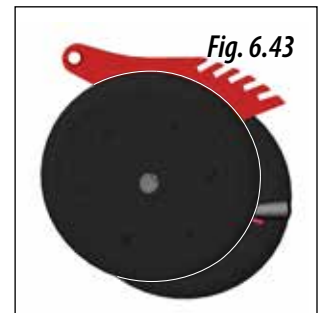


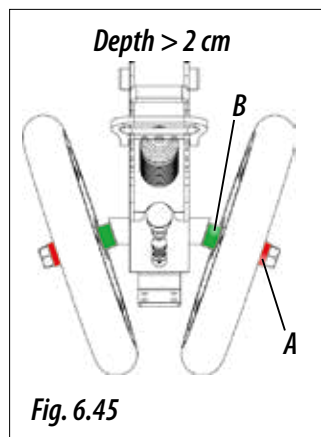
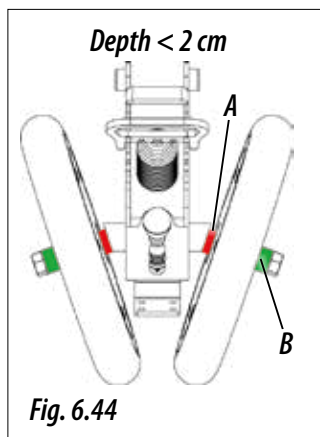
Fig. 6.43

6.9.1 WHEEL'S WORKING WIDTH

Depending on the planting depth, the working width of the furrow closing wheels needs to be adjusted so that they cover and compact the seed properly:

- **PLANTING DEPTH LESS THAN 2 CM** or when **THE FURROW STAYS OPEN:** the shaft sleeves A (narrow) and B (wide) need to be assembled as shown in picture 6.44.

- **PLANTING DEPTH MORE THAN 2 CM:** the shaft sleeves A (narrow) and B (wide) need to be assembled as shown in picture 6.45.



(*) This adjustment is valid for standard rubber press wheels of 1" and 2".

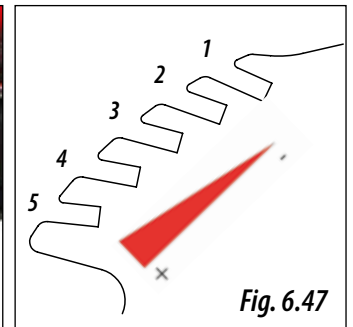


IMPORTANT: BE SPECIALLY CAREFUL WHEN DISASSEMBLING THE WHEELS, SINCE THE THREAD HAS A DIFFERENT DIRECTION DEPENDING ON THE SIDE TO PREVENT THE SCREW FROM LOOSENING DURING WORK.

6.9.2 PRESSURE ONTO THE SEED

To adjust the pressure exerted by the V-shaped press wheel, pull the fixing handle (1, Fig. 6.46) and place it at the suitable position for the type of terrain to be planted.

Next table shows the exerted pressure depending on the position of the fixing handle (Fig. 6.47):



POSITION	PRESSURE (kg _f)
1	18
2	20
3	22
4	26
5	28



ON TILLED TERRAINS, THE PRESSURE SHOULD BE REDUCED. ON THE OTHER HAND, ON NOT VERY TILLED TERRAINS, THE PRESSURE SHOULD BE INCREASED.



WHEN CHANGING THE POSITION OF THE FIXING HANDLE, PULL IT STRONGLY.

6.9.3 BEARING ANGLE

The wheel's bearing angle should be adjusted depending on the type of terrain to be planted.

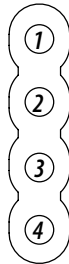
To change the bearing angle of the press wheels onto the terrain, it is necessary to push the position lever (Fig. 6.48) inwards and shift it to place it at the correct position. Check that the position lever is fixed at the desired position.



Fig. 6.48

Position lever's adjustments:

POSITION	ANGLE	WHEEL'S OPENING
1	2.8	OPEN
2	2.2	OPEN
3	-7.2	CLOSED
4	-12.2	CLOSED



6.10 OPENING COMPONENTS

The depth at which the opening components are buried depends on the planting depth of the metering unit which has the opening component assembled and the opening component's adjustment.



ADJUST THESE COMPONENTS ONLY AFTER ADJUSTING THE METERING UNIT'S PLANTING DEPTH.



WHEEL'S BEARING ANGLE IN THE TABLE IS SHOWN IN RELATION TO THE FORWARD DIRECTION (FIG. 6.49 AND 6.50).

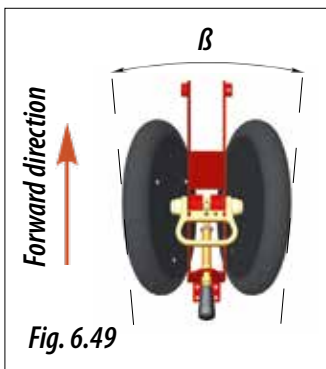


Fig. 6.49

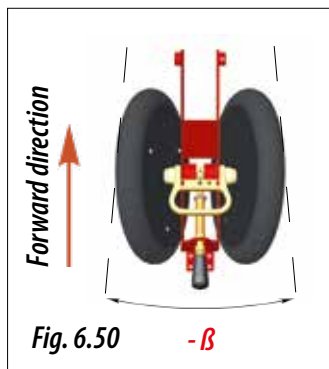


Fig. 6.50

6.10.1 ADJUSTING THE BLADE AND THE CLOD REMOVER

The depth at which the blade and the clod remover are going to be buried depends on the type of metering unit:



CAUTION: ADJUST THE BLADE SO THAT IT IS 1 OR 2 CM BELOW THE CLOD REMOVER.

- 1- Loosen the screws (1, Fig. 6.51) to free the blade and the clod remover.
- 2- Remove safety ring and securing bolt (2, Fig.6.51).
- 3- Place the blade and the clod remover at the desired height.
- 4- Adjust the screws and locknuts (1, Fig. 6.51) to secure each component.

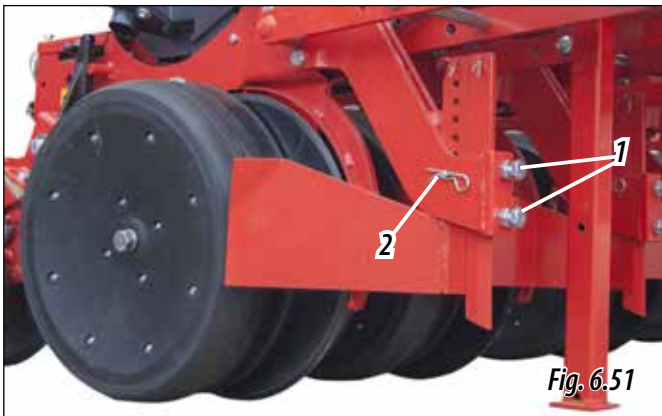


Fig. 6.51



CLOD REMOVERS CAN BE REPLACED BY DISC OPENERS OR FURROW-OPENER BLADES OR FURROW'S RESIDUE ROTARY CLEANERS.

6.10.2 ADJUSTING THE DISC FURROW OPENER IN UNIT PROSEM K (OPTIONAL)

To adjust the disc opener's working depth:

- 1- Remove the nut (1, Fig. 6.52), hold the disc with one hand and use the other one to remove the screw.
- 2- Place the disc at the desired position, A, B or C.
- 3- Place the screw at the same position as the disc and fix it using the nut.

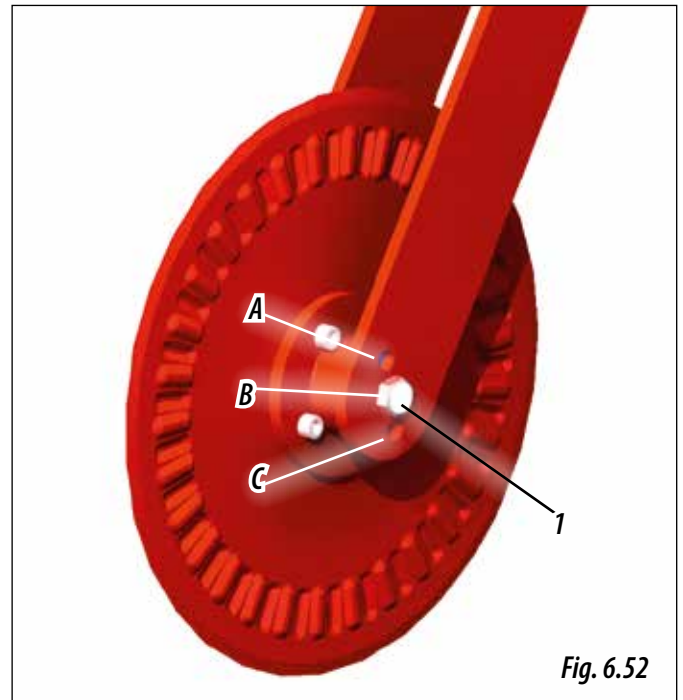


Fig. 6.52

DISC OPENER'S POSITION	DEPTH (cm)
A	0
B	2
C	4

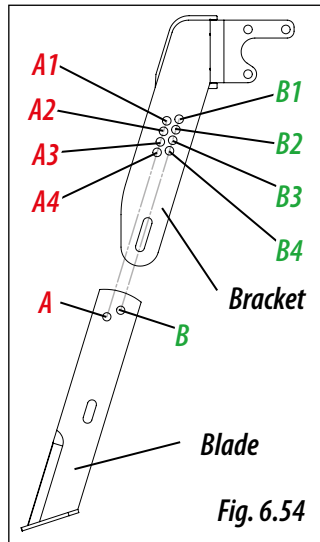
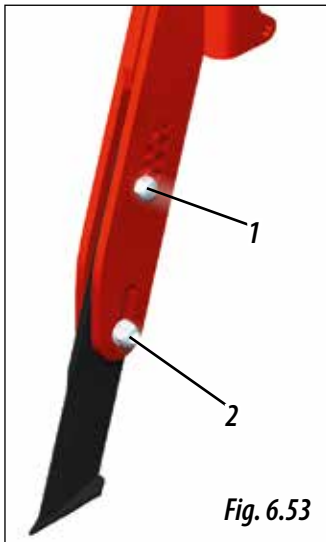


THE PENETRATION DEPTH MAY VARY DEPENDING ON THE WORKING CONDITIONS.

6.10.3 ADJUSTING THE FURROW-OPENER BLADE (OPCIONAL)

To adjust the blade's working depth:

- 1- Remove both the nut and the position screw (1, Fig. 6.53)
- 2- Loosen both the nut and the fixing screw (2, Fig. 6.53)
- 3- Place the blade at the desired height, adjust the height until one of the holes (A or B, Fig. 6.54) fits another one.



BLADE'S POSITION	SUPPORT'S POSITION	DEPTH (CM)
A	A1	0
B	B1	0.7
A	A2	1.4
B	B2	2.2
A	A3	2.9
B	B3	3.6
A	A4	4.3
B	B4	5



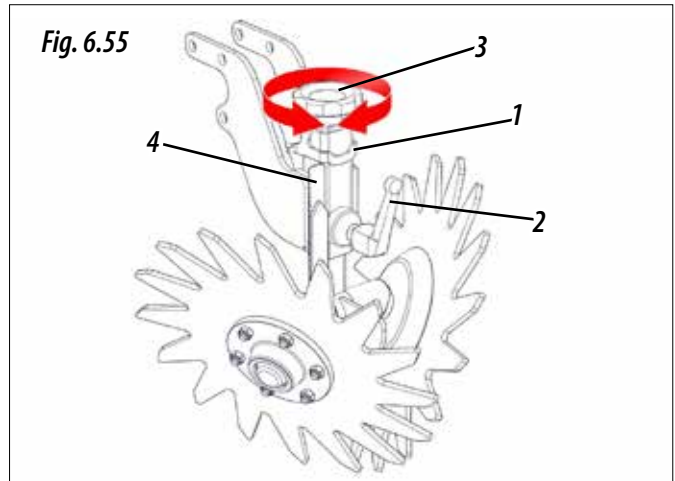
THE FIXING SCREW (1, FIG. 6.53) NEEDS TO BE PLACED AT THE SAME LETTER IN BOTH THE BLADE AND THE SUPPORT (FIG. 6.54). POSITIONS **A AND B ARE NOT INTERCHANGEABLES**. TO ADJUST THE BLADE'S WORKING DEPTH DEPENDING ON THE POSITION OF THE POSITION SCREW (1, FIG. 6.53), SEE NEXT TABLE AND PICTURE 6.54:



THE PENETRATION DEPTH MAY VARY DEPENDING ON THE WORKING CONDITIONS.

6.10.4 ADJUSTING THE FURROW'S RESIDUE ROTARY CLEANER IN PROSEM K METERING UNITS (OPTIONAL)

The furrow's residue rotary cleaners remove the residues of the sowing row. They need to work always superficially and can be adjusted in HEIGHT.



To adjust the working height of the furrow's residue rotary cleaner, follow these steps:

- 1- Remove the R-clip and locking plate (1, Fig. 6.55).
- 2- Loosen the securing lever (2, Fig. 6.55)
- 3- Turn the knob (3, Fig. 6.55) until reaching the desired working height. To adjust the height, use the graduated scale (4, Fig. 6.55).
- 4- Fix the position using the lever (2, Fig. 6.55).
- 5- Lower the locking plate and secure it with the R-clip (1, Fig. 6.55).



PERFORM THIS OPERATION ALWAYS WHEN THE PLANTER IS IN A RAISED POSITION.

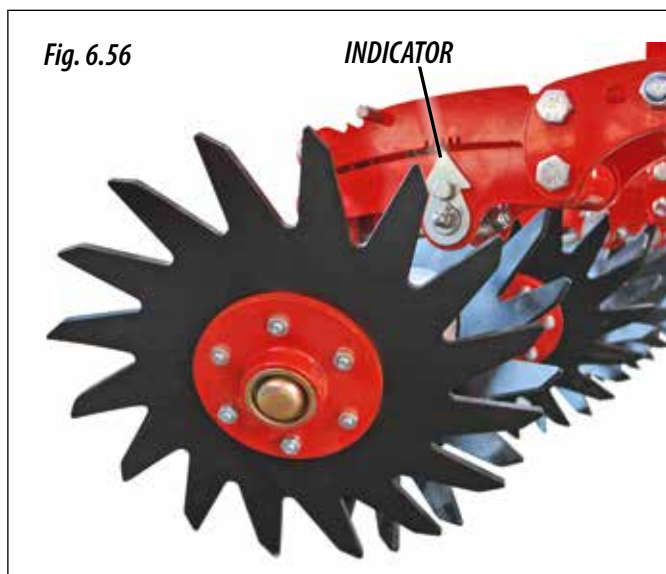
6.11 FURROW'S RESIDUE ROTARY CLEANERS WITH PARALLELOGRAM (OPTIONAL)



PERFORM THIS OPERATION WITH THE MACHINE IN A RAISED POSITION.

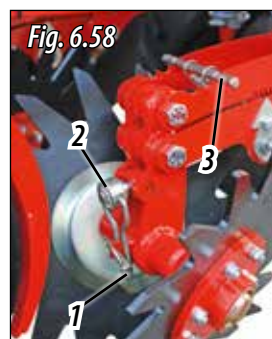
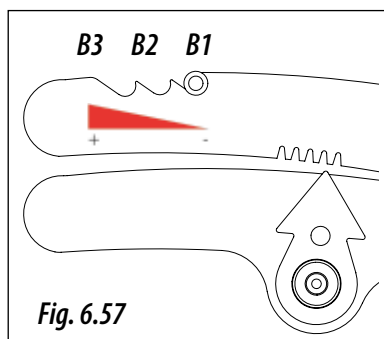
The furrow's residue rotary cleaner pushes aside the residues present in the sowing row. They need always to work superficially pushing the residue aside.

Both the PRESSURE exerted onto the ground and the WORKING DEPTH STOP can be adjusted as follows:



PRESSURE

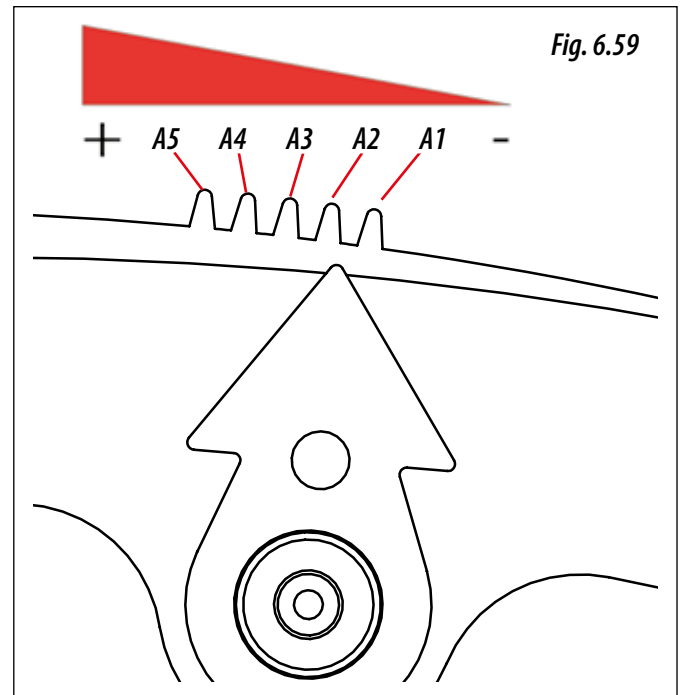
To adjust the pressure of the furrow's residue rotary cleaner, pull the handle (3, Fig. 6.58) and place it at one of the 3 working positions (B1, B2 or B3, Fig. 6.57).



WORKING DEPTH STOP

To adjust the working depth stop, follow these steps:

- 1- Remove the pin (1, Fig. 6.58) to free the crank (2, Fig. 6.58).
- 2- Raise the furrow's residue rotary cleaner using one hand and use the other hand to turn the crank until the working depth stop is set at the desired position. For this purpose, use the depth indicator (Fig. 6.59).
- 3- Once the working depth stop has been set, lower the crank (2, Fig. 6.58) and place the pin back (1, Fig. 6.58) to lock the stop.



AFTER ADJUSTING, WORK THE GROUND SOME METRES TO CHECK THAT THE WORKING DEPTH STOP HAS BEEN CORRECTLY SET.

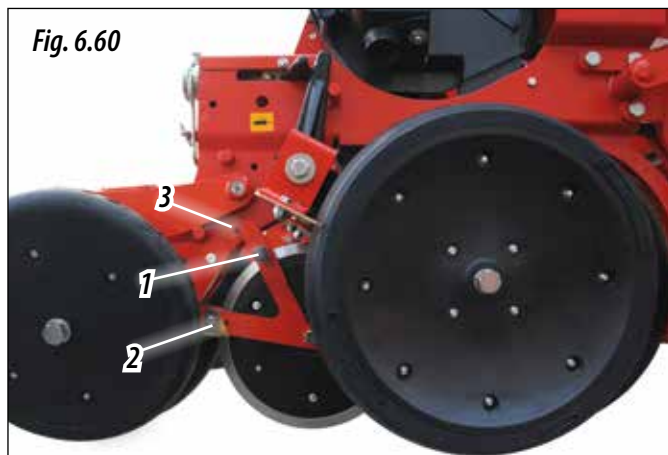
In the case of no-till farming on hard ground, it is not necessary to adjust the working depth stop, since the furrow's residue rotary cleaners will adapt to the terrain without turning the soil. In this case, the working depth stop needs to be inactive, set at position A5 (Fig. 6.59).

In the case of tilled ground, either adjust the working depth stop or exclude the furrow's residue rotary cleaners. To exclude them, set the working depth stop at position A1 (Fig. 6.59).

6.12 SEED PRESSING WHEEL PROSEM K (OPTIONAL)

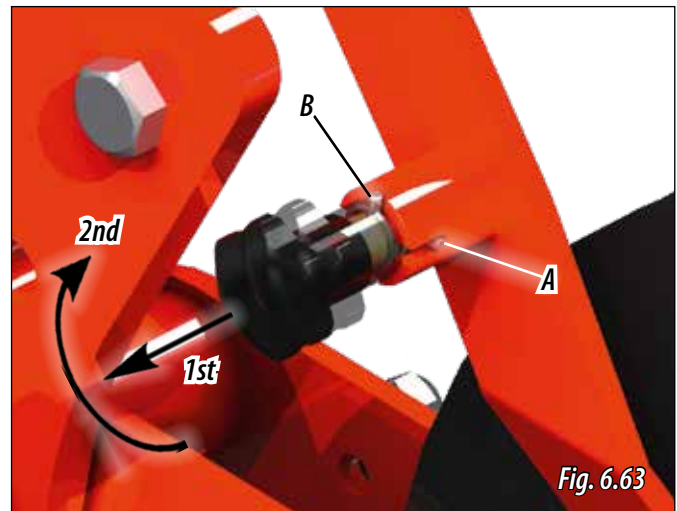
Seed pressing wheels are placed between the wheels that control the working depth and the furrow closing wheels (Fig. 6.60).

These wheels coincide with the seedbed where the seed is placed. Their function is to specify the depth at which the seed will be placed and compact the covering earth.



This component can be excluded following these steps:

- 1- Raise the seed pressing wheel using one hand.
- 2- Use the other hand to pull the securing knob (1, Fig. 6.60) and place it at the exclusion point (3, Fig. 6.60). To fix this position, turn the securing knob to place the pin at position A (Fig. 6.63).



To unlock the seed pressing wheel from the exclusion position, pull the security knob (1, Fig. 6.60) and turn the pin until it reaches the position B (Fig. 6.63).

There are two types of seed pressing wheels:

- **RUBBER:** for delicate seeds that may break when compacting the earth. (Fig. 6.61).
- **STAINLESS STEEL:** for not very tilled or muddy terrains (Fig. 6.62).



SEED PRESSING WHEEL'S SCRAPERS CAN BE ADJUSTED USING THE SCREWS (2, FIG. 6.60). ADJUST THE SCRAPERS AT 3-4 MM AWAY FROM THE WHEEL (MAKE SURE THE SCRAPER DOES NOT TOUCH THE WHEEL UNDER ANY CONDITION).



IF THE METERING UNITS HAVE V-SHAPED PRESS WHEELS WITH SHORT CONNECTING ROD (SEE 6.11.1 V-SHAPED REAR PRESS WHEELS – PROSEM K), THEN THE METERING UNITS CANNOT BE EQUIPPED ALSO WITH SEED PRESSING WHEELS.



IMPORTANT: MAKE SURE THAT THE KNOB (1, FIG. 6.60) IS AT POSITION B (FIG. 6.63) BEFORE STARTING TO PLANT. OTHERWISE THE SEED PRESSING WHEEL WILL NOT WORK PROPERLY AND THIS COULD DAMAGE THE PLANTER.

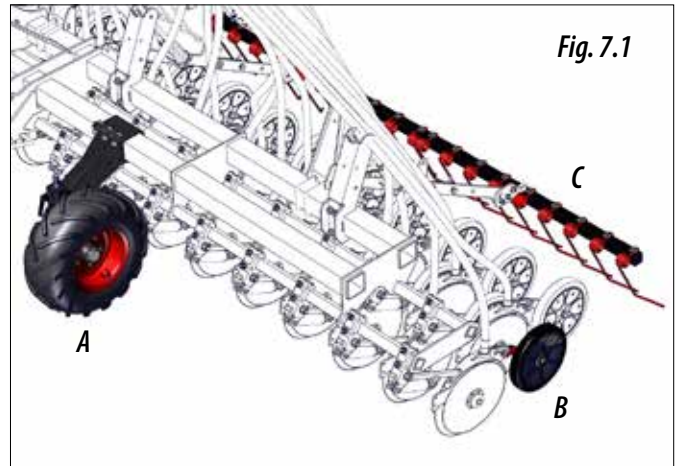
7. SEEDER MODEL ADJUSTMENTS

This chapter details the adjustments that have to be made to the **ARGO** seeder according to the requirements of the ground and the type of seed being sown.

The values provided in this manual may vary depending on the ground conditions, climate factors and the condition of the machine.

The following points should be taken into account when adjusting the sowing unit:

- **THE SOWING EQUIPMENT'S DEPTH CONTROL WHEELS.** This component controls the planting depth of the whole unit (A, Fig. 7.1).
- **THE SOWING ARMS' DEPTH CONTROL WHEELS.** This component controls the planting depth of each individual arm (B, Fig. 7.1).
- **THE HARROW.** This part is responsible for closing the furrow and fully covering the seeds (C, Fig. 7.1).



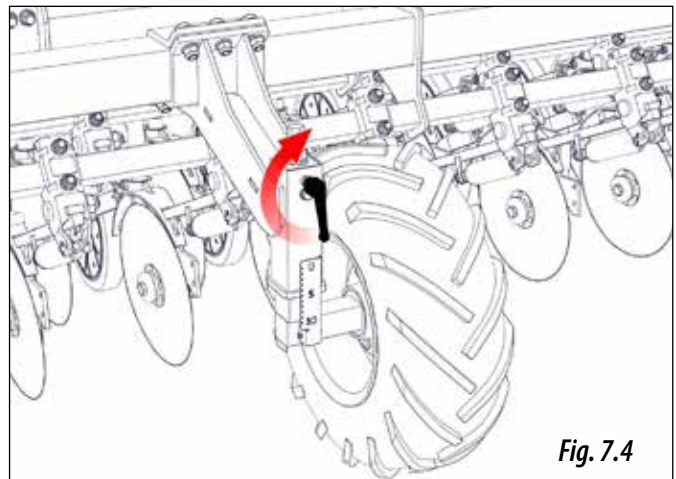
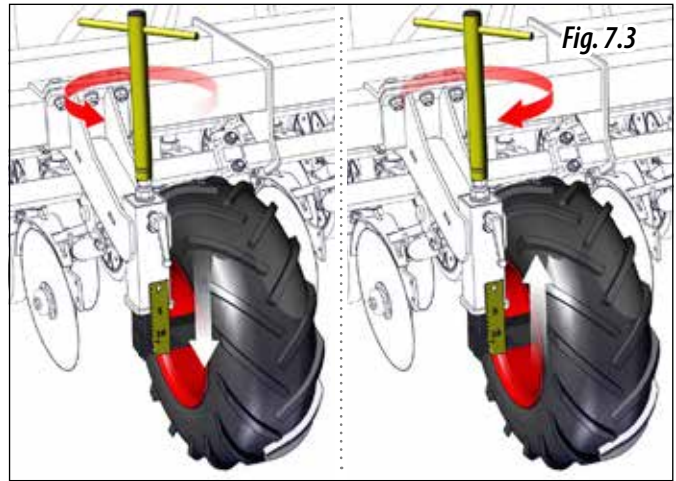
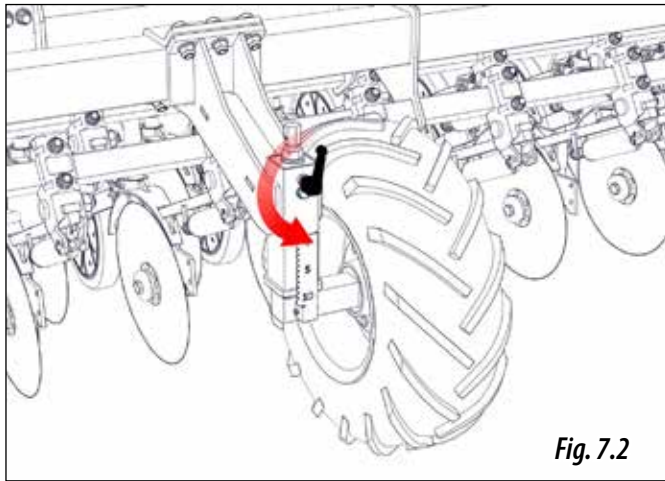
IMPORTANT: SET ALL OF THE ADJUSTMENT COMPONENTS AT THE SAME LEVEL.

7.1 SOWING EQUIPMENT DEPTH CONTROL WHEELS

The wheels at the sides of the sowing equipment control the planting depth of the folding parts. To adjust these wheels you should use the specific key that is supplied with the machine.

To make the adjustment, follows these steps:

- 1- Unlock the wheel using the fastening lever (Fig. 7.2).
- 2- Place the specific key in the wheel spindle and turn it to lower or raise the wheel (Fig. 7.3).
- 3- Use the graduated scale to set it to the height at which you want to work.
- 4- Put away the specific key and lock the wheel with the fastening lever (Fig. 7.4).

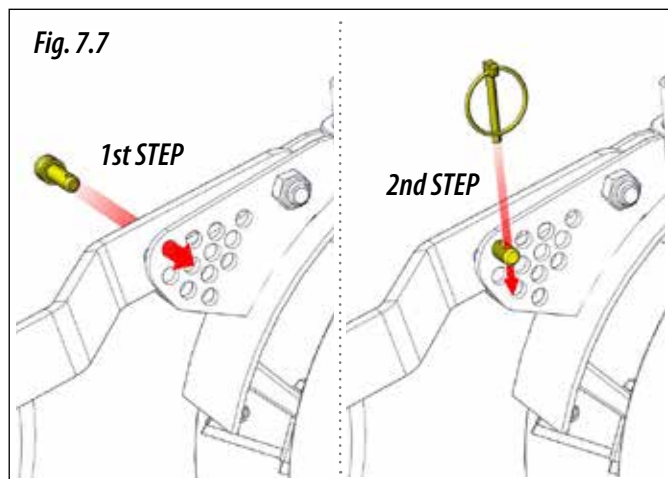
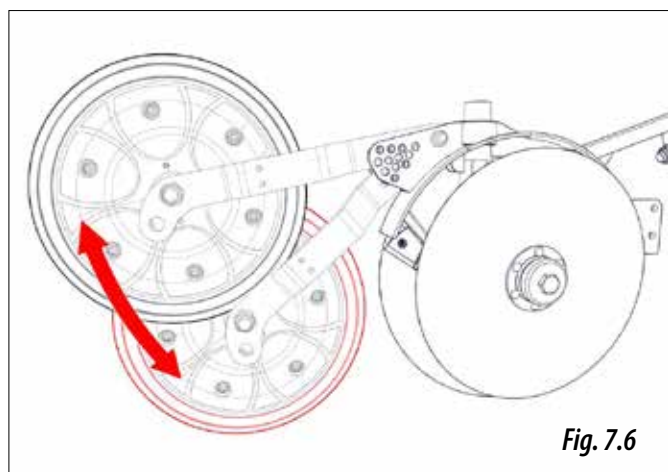
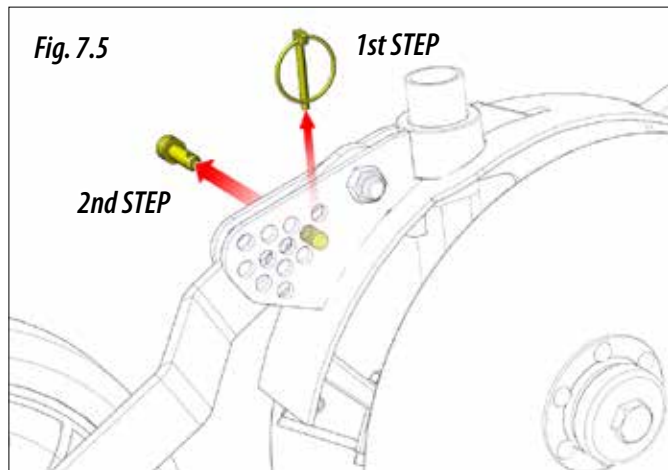


SET ALL OF THE WHEELS AT THE SAME HEIGHT TO ENSURE EVEN SOWING.

7.2 SOWING UNIT DEPTH CONTROL WHEELS

Proceed as follows to adjust the depth of each individual arm:

- 1- Remove the pin and clip (Fig. 7.5).
- 2- Move the wheel to the desired position (Fig. 7.6).
- 3- After establishing the depth, re-install the pin and clip to set the position (Fig. 7.7).

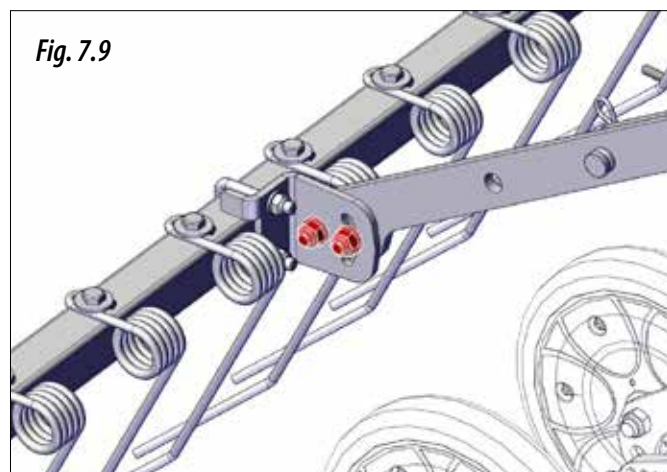
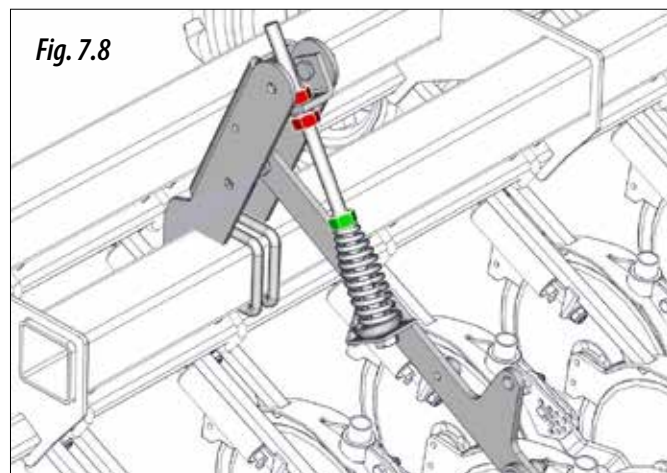


7.3 HARROW

The harrow can be adjusted in several ways to suit different types of soil.

The following can be adjusted:

- **HEIGHT**, by adjusting the upper nuts (in red, Fig. 7.8).
- **PRESSURE**, via the upper nut on the spring (in green, Fig. 7.8).
- **THE ANGLE OF THE TINES**, by adjusting the screw (in red, Fig. 7.9).

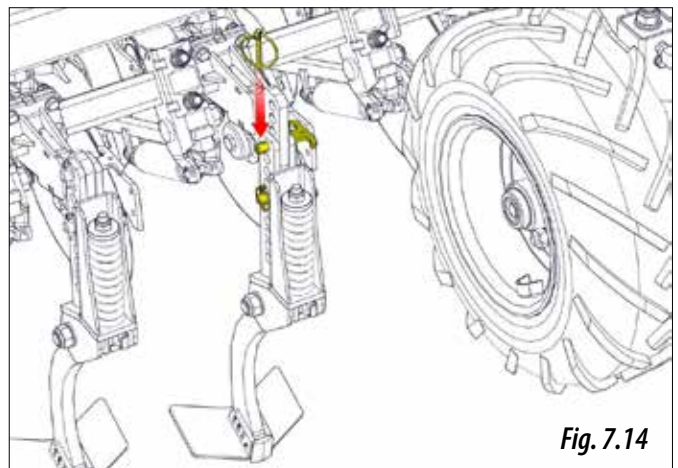
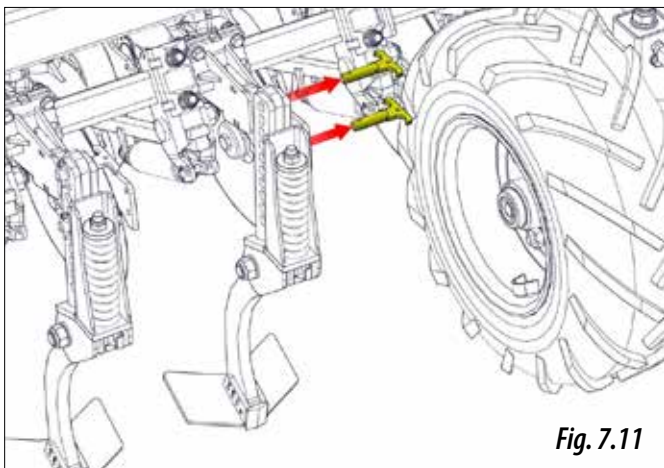
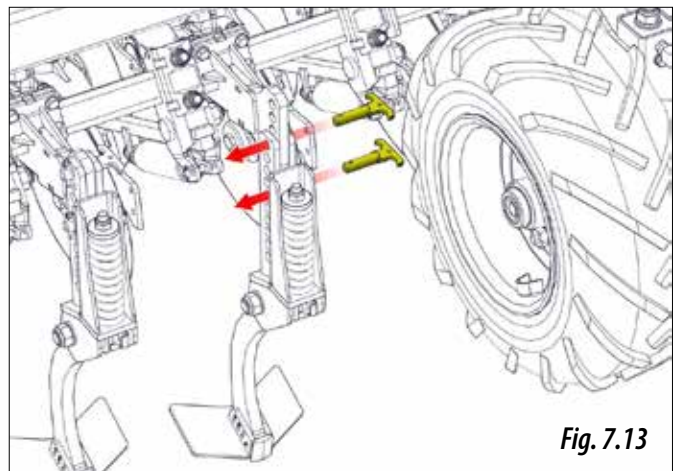
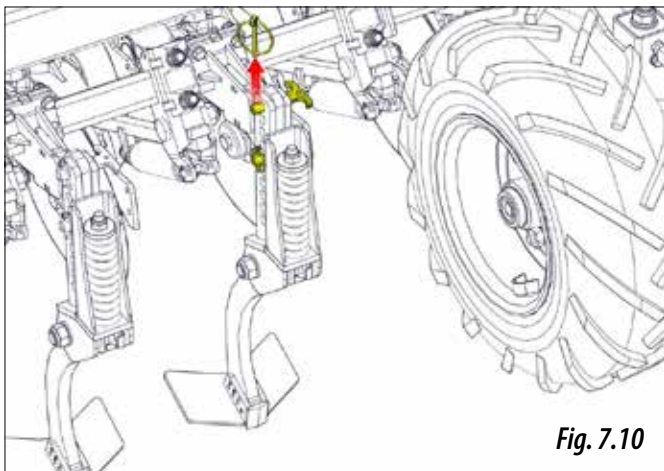
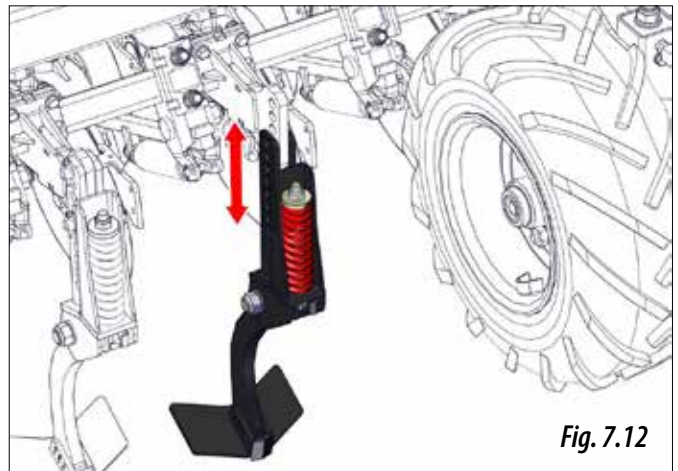


7.4 TRACK ERADICATOR

To remove the tracks left by the tractor, the planter can be equipped with track eradicator arms.

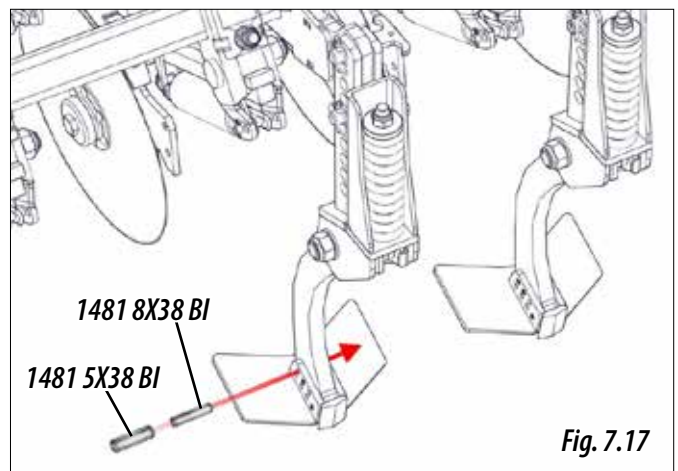
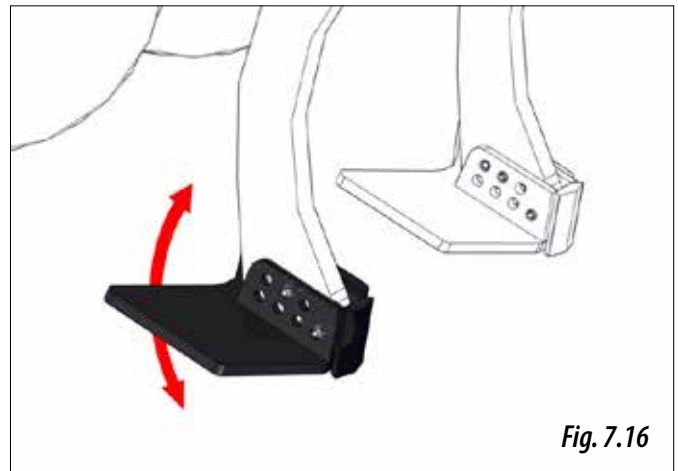
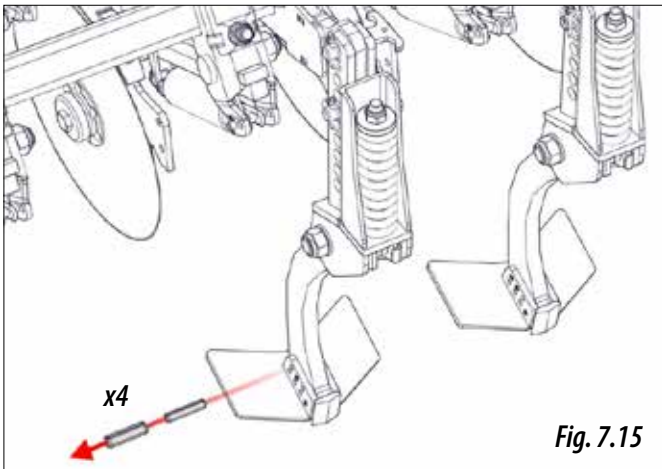
To adjust the **WORKING DEPTH** of each arm, you must:

- 1- Remove the ring pins and pins (Fig. 7.10 and Fig. 7.11).
- 2- Move the arm vertically to the desired position (Fig. 7.12).
- 3- Install both pins and the ring pins (Fig. 7.13 and Fig. 7.14).



To adjust the **ANGLE OF ATTACK** of each arm, you must:

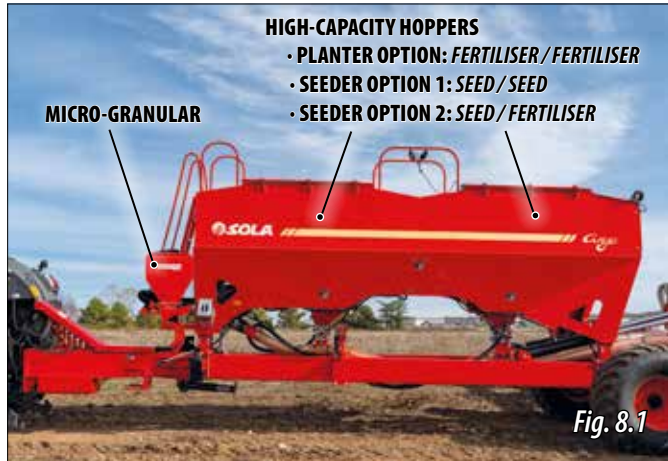
- 1- Remove all of the pins (Fig. 7.15).
- 2- Adjust the position of the tine to the desired angle (Fig. 7.16).
- 3- Install new pins, at least 3 of each type (Fig. 7.17)



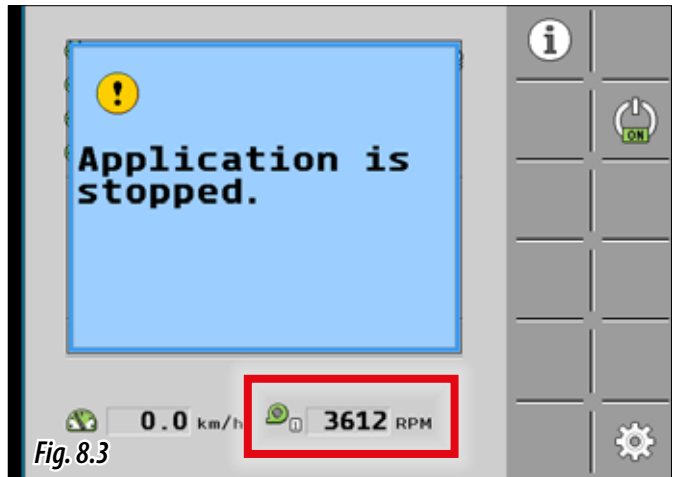
8. ADJUSTING THE CENTRAL HOPPERS

The machine can have 2 types of central hoppers:

- **TWO HIGH-CAPACITY HOPPERS**
for seeds and/or fertiliser (according to model).
- **TWO SMALL HOPPERS**
for micro-granular products (according to model).



TO ENSURE THE PROPER DISTRIBUTION OF THE PRODUCT INSIDE THE HIGH-CAPACITY HOPPERS, THE PRESSURE LEVEL MUST BE BETWEEN 35 AND 45 mbar (FIG. 8.2). AN APPROX. FAN SPEED OF 3600 rpm (FIG. 8.3).



8.1 HIGH-CAPACITY HOPPERS

High-capacity hoppers have one dispenser for each hopper. The dispensers can be used with small seeds (e.g. rape) or normal seeds (e.g. wheat or barley) or granulated fertiliser.

Depending on the configuration of the machine, the lower hatches of the dispensers must be adapted. To do this, you must::

- 1- Act on the 2 closures of each dispenser to open the rubber covers (Fig. 8.4)
- 2- Remove the screw and its washers together with the 2 plastic plugs (Fig. 8.5), in this way the trap is unlocked.

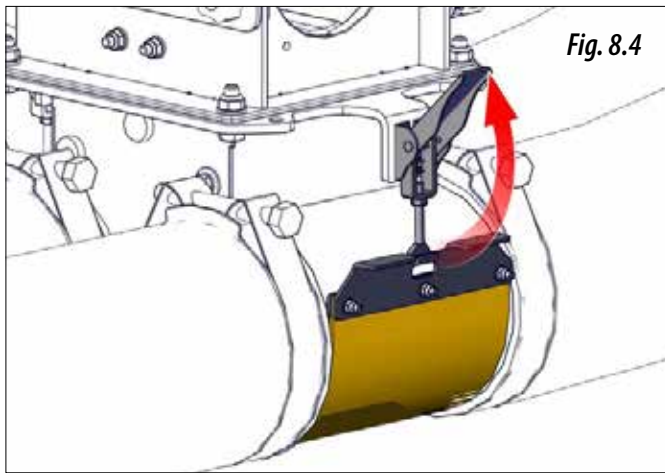


Fig. 8.4

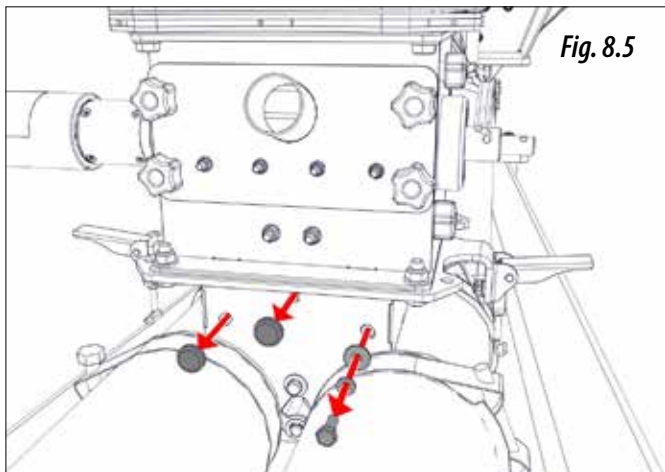


Fig. 8.5

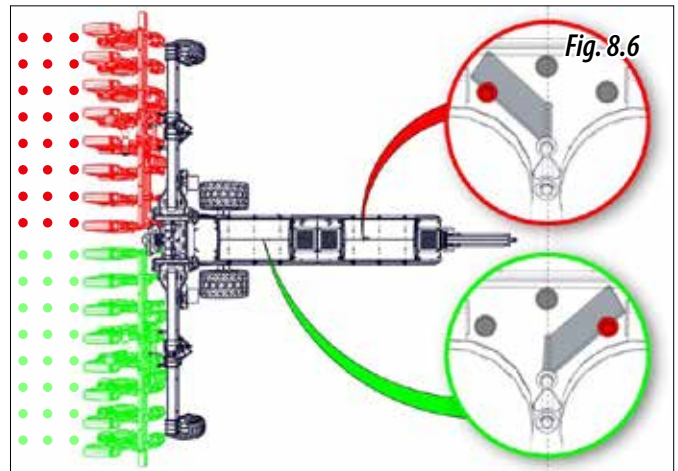


Fig. 8.6

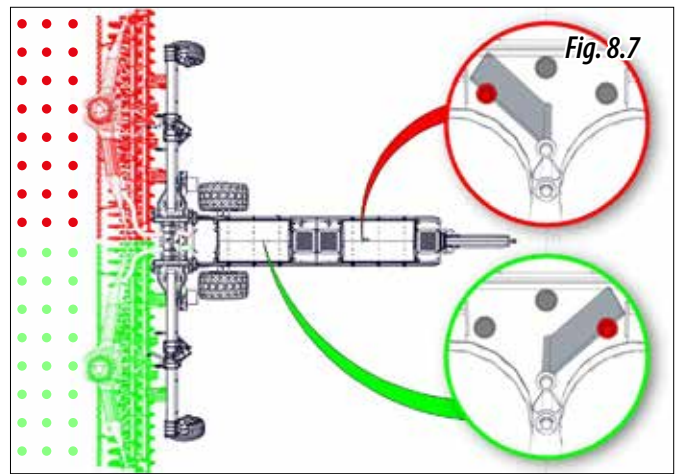


Fig. 8.7

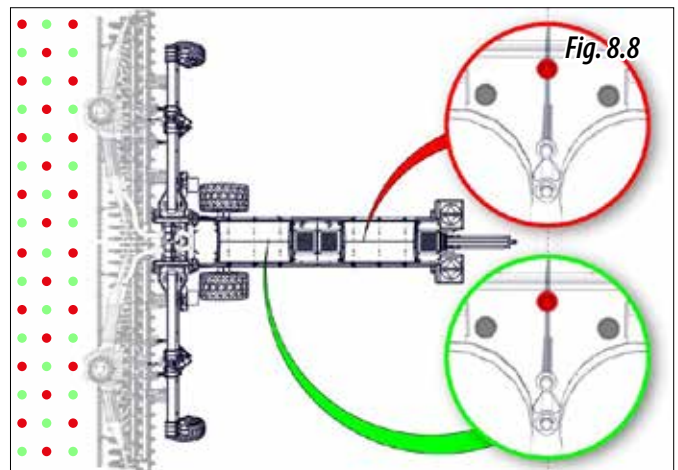


Fig. 8.8

- 3- Depending on the configuration of the machine and the products to be used in the hoppers, the traps must be assembled according to the case:

- **FERTILIZER / FERTILIZER** (Fig. 8.6).
- **SEED/SEED** (Fig. 8.7).
- **FERTILIZER/SEED** (Fig. 8.8).



FOR MACHINE CONFIGURATIONS WITH DIFFERENT PRODUCTS FOR EACH HOPPER (FIG. 8.8), IT WILL NOT BE POSSIBLE TO SHUT OFF CUT HALF MACHINE.



IMPORTANT: IF THE TRAPS ARE NOT CONFIGURED PROPERLY, THE MACHINE WILL NOT SOW CORRECTLY



POSITION THE TRAPS THROUGH THE LOWER ACCESS HOLES.

- 4- Once the trap has been positioned in the new configuration, lock it using the screw and the washers, place the plugs in the 2 holes that have been left open (Fig. 8.6, 8.7 o 8.8)
- 5- When finished, the closing rubbers should be placed and secured by the quick fasteners (Fig. 8.4).

The dispenser should be configured according to the type of product and quantity being dispensed. Each dispenser has a roller that can be configured in sections (e.g. roller with 4 sections, Fig. 8.9). You can install between 1 and 7 sections.

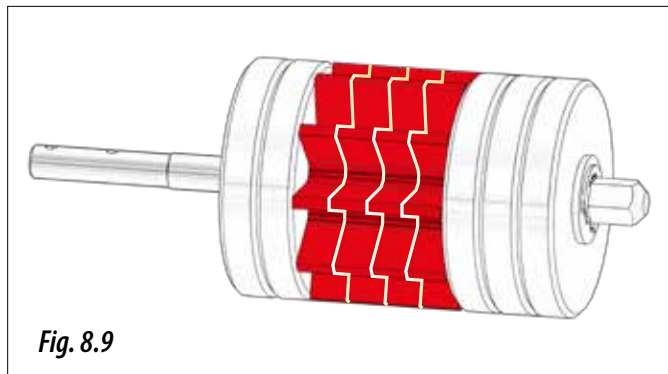


Fig. 8.9



THERE ARE SEVERAL TYPES OF SECTIONS FOR: HIGH, MEDIUM, LOW AND VERY LOW DOSES (FIG. 8.10).

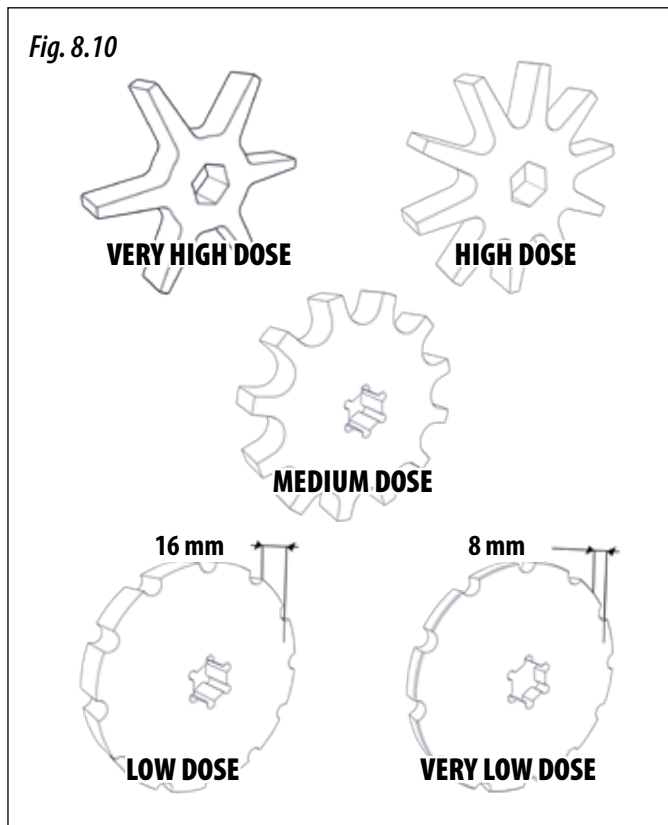


Fig. 8.10

8.1.1 ADJUSTING THE DISPENSER

Follow these steps to set the number of sections to configure the dispenser for the desired dose:

- 1- Remove the R-clip (Fig. 8.11).
- 2- Remove the two knobs (Fig. 8.12).
- 3- Remove the side support (Fig. 8.13) and remove the roller (Fig. 8.14).

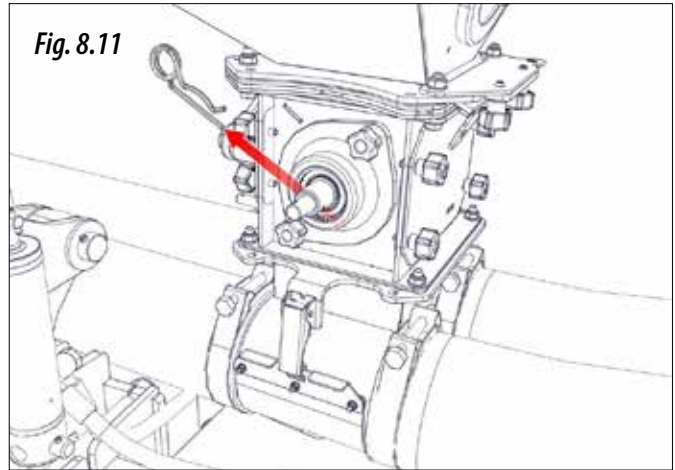


Fig. 8.11

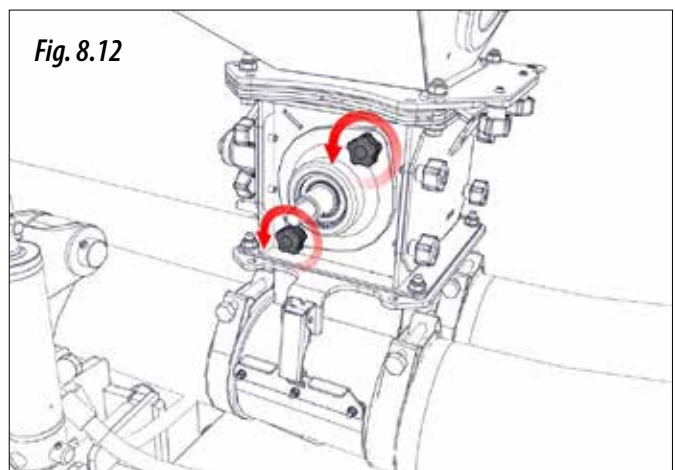


Fig. 8.12

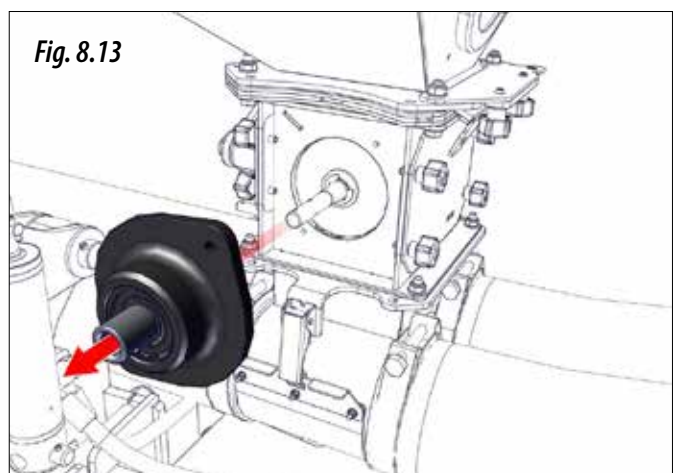


Fig. 8.13

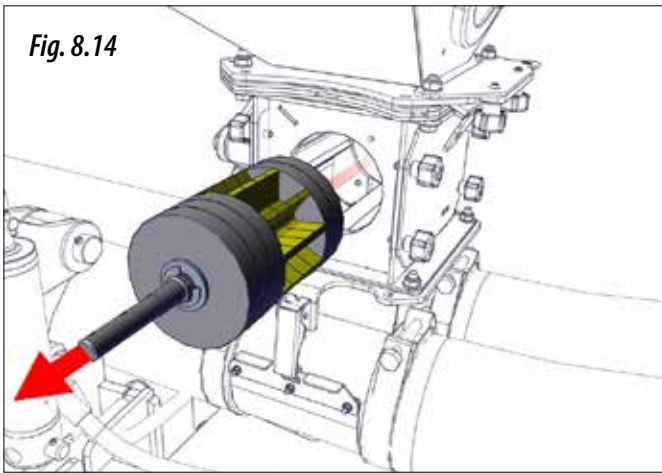


Fig. 8.14

4- Mount the necessary number of sections for the desired dose. To change the section configuration, remove the circlip, mount the desired sections and re-install the circlip (Fig. 8.15).



TO DETERMINE THE NUMBER OF SECTIONS TO BE MOUNTED, SEE SECTION 8.1.2 PRELIMINARY FLOW TEST.

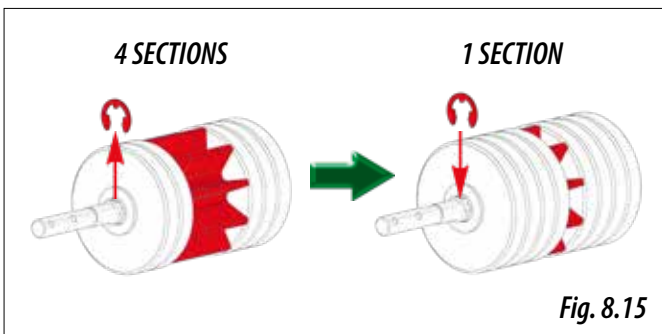


Fig. 8.15

5- Re-install the roller and side support and secure it with the two knobs.



MAKE SURE THAT THE CIRCLIPS ARE PROPERLY MOUNTED IN THEIR HOUSING. TO DO THIS, TURN THE CIRCLIP. DO NOT FORGET THE **R-CLIP**; THE DISPENSER WILL NOT WORK WITHOUT IT (Fig. 8.16).

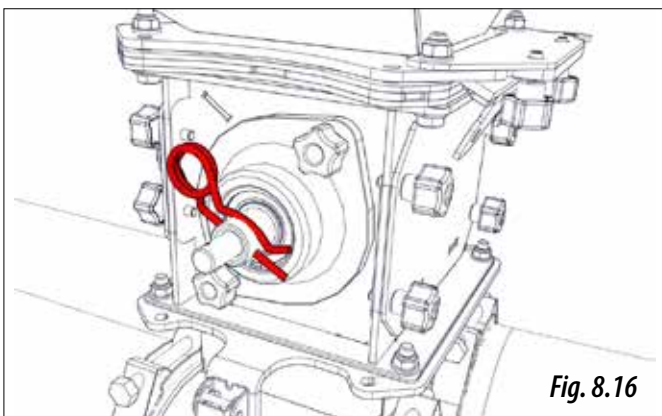


Fig. 8.16

8.1.2 PRELIMINARY FLOW TEST

You must complete a number of steps before performing the test:



PERFORM THE PRELIMINARY FLOW TEST ON ALL DISPENSERS.

1- Close the valves above the dispensers (Fig. 8.17).

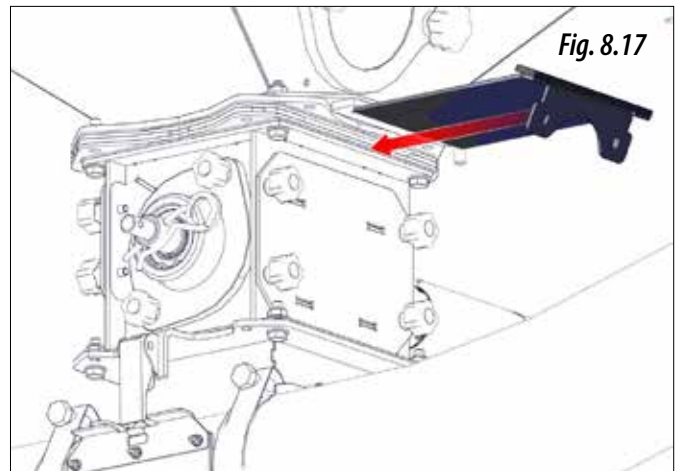


Fig. 8.17

2- Fill the hopper with product (see section 5.5.2 CENTRAL HOPPERS).

3- Remove the roller to see the type and quantity of sectors installed (see section 8.1.1 ADJUSTING THE DISPENSER).

4- Place the sack that is supplied or a container below the dispensers and open the rubber cover by releasing the latches; there is one on either side of the dispenser (Fig. 8.18)

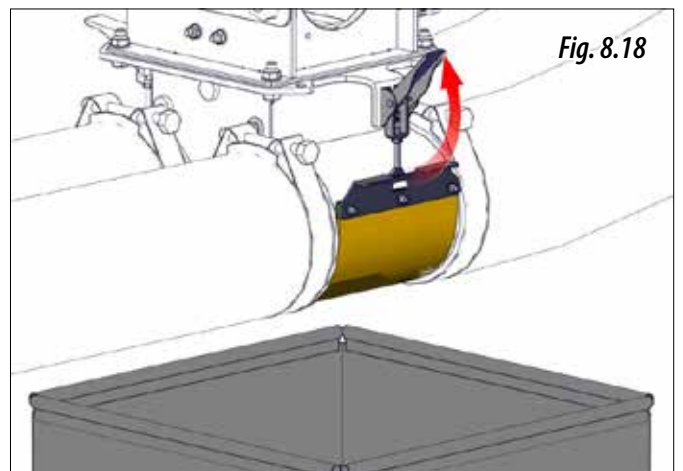


Fig. 8.18

5- To continue with the calibration, see the ISOBUS manual that is supplied with the machine (see the section on PERFORMING A CALIBRATION TEST). Here you must enter the following values (Fig. 8.19):

- **desired WORKING SPEED** (km/h).
- **desired RATE (dose)** (kg/ha).
- **CALIBRATION FACTOR**; this value can be obtained according to: the specific weight of the product being used; the type and number of sections mounted on the roller, see the table below:

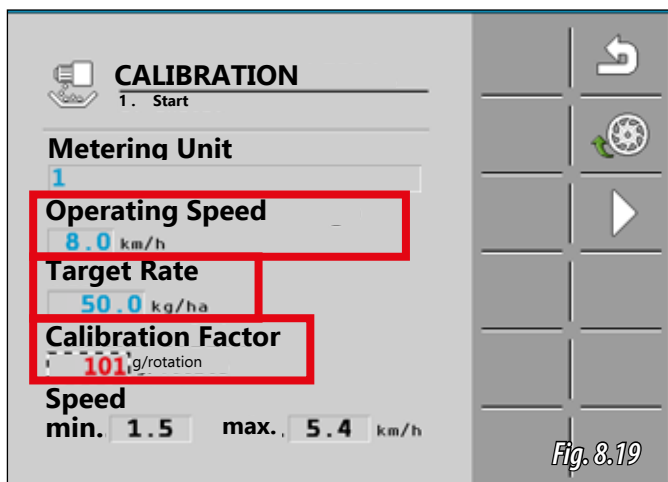


Fig. 8.19

6- When the 3 desired values have been entered, check the minimum and maximum working speeds on the controller's screen. When the speed at which you want to work is between these two values (in red Fig. 8.20), open the drop door and fix it in its working position (Fig. 8.21). Fill the dispensing cells (in blue, Fig.8.20) and then perform the test (in yellow, Fig.8.20).



IF YOU WANT TO WORK AT A SPEED THAT IS HIGHER THAN THE MAXIMUM SPEED SHOWN ON THE CONTROLLER, YOU MUST MOUNT ADDITIONAL SECTIONS OF THE SAME KIND ON THE ROLLER OR CHANGE THE TYPE OF SECTIONS. YOU MUST THEN CHANGE THE CALIBRATION FACTOR ACCORDING TO THE NEW CONFIGURATION.



IF YOU WANT TO WORK AT A SPEED THAT IS LOWER THAN THE MINIMUM SPEED SHOWN ON THE CONTROLLER, YOU MUST REMOVE SECTIONS FROM THE ROLLER OR CHANGE THE TYPE OF SECTIONS. YOU MUST THEN CHANGE THE CALIBRATION FACTOR ACCORDING TO THE NEW CONFIGURATION.



YOU MUST ENTER A VALUE FOR THE CALIBRATION FACTOR. IF THE FACTOR IS NOT CORRECT, THE CALIBRATION CANNOT BE PERFORMED.

CALIBRATION FACTOR (g/rev.)	NUMBER SECTIONS	1			2			3			4			5			6			7		
		0.8	1	1.2	0.8	1	1.2	0.8	1	1.2	0.8	1	1.2	0.8	1	1.2	0.8	1	1.2	0.8	1	1.2
SECTION TYPE	VERY HIGH DOSE	66	83	100	133	166	199	199	249	299	266	332	398	332	415	498	398	498	598	465	581	697
	HIGH DOSE	51	64	77	103	129	154	154	193	231	206	257	308	257	321	386	308	386	463	360	450	540
	MEDIUM DOSE	28	35	42	56	70	84	84	105	126	112	140	168	140	175	210	168	210	252	196	245	294
	LOW DOSE	4	5	6	8	9	11	11	14	17	15	19	23	19	24	28	23	28	34	27	33	40
	VERY LOW DOSE	2	2	3	4	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

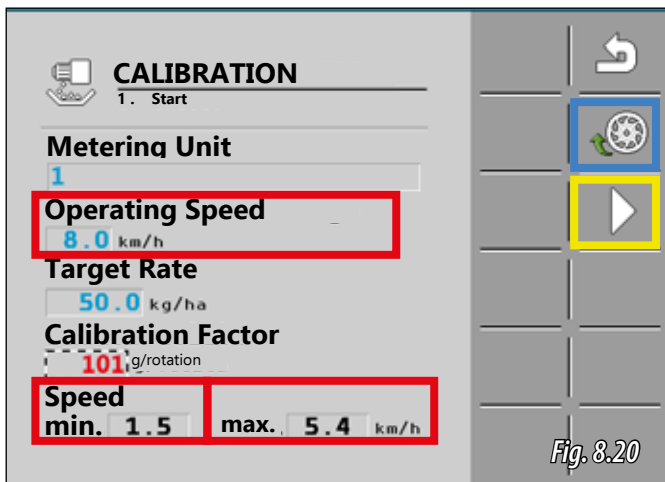


Fig. 8.20

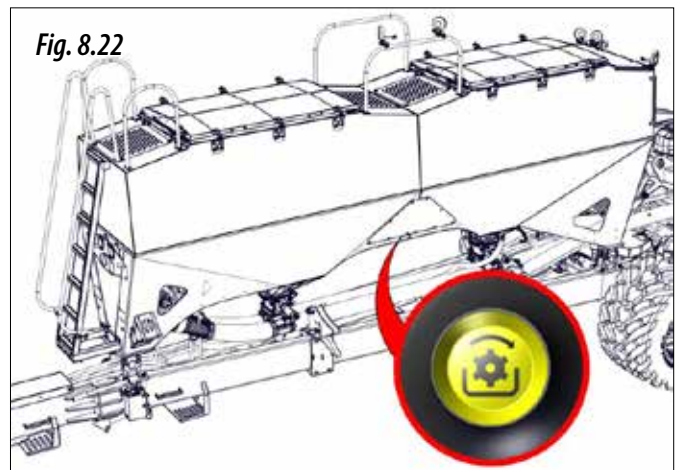


Fig. 8.22

PERFORM THE CALIBRATION TEST ON ALL OF THE MACHINE'S DISPENSERS. (Fig. 8.23).

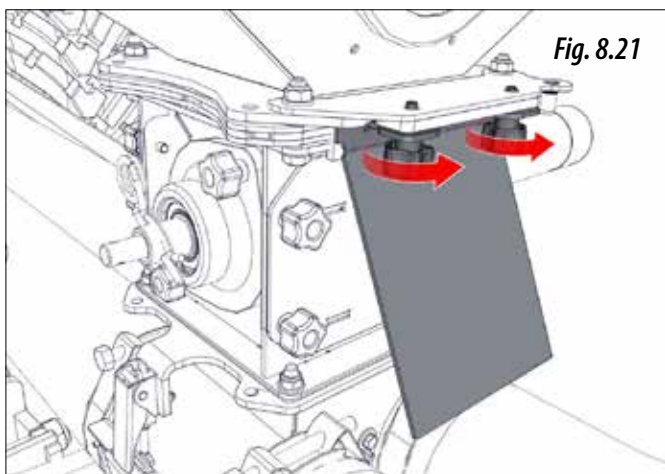


Fig. 8.21



IMPORTANT: CHECK THE CONDITION OF THE FOAM ON THE DROP DOOR TO ENSURE THAT THE DISPENSER IS PROPERLY SEALED. IF THE FOAM IS IN A POOR CONDITION OR THE DROP DOOR IS NOT MOUNTED IN ITS WORKING POSITION (FIG 8.21), THE CORRECT PRESSURE WILL NOT BE DELIVERED TO THE HOPPER AND SOME PRODUCT WILL BE LOST AT THIS POINT.



IMPORTANT: FOR DOSES WHERE THE TOTAL AMOUNT OF PRODUCT IS AROUND 400 Kg/Ha (BEAR IN MIND SEEDS AND/OR FERTILISER), CHECK TO ENSURE THAT THERE IS NO BUILD-UP OF MATERIAL OR CLOGGING OF THE PNEUMATIC SYSTEM. IF THERE IS, YOU MUST REDUCE THE DOSE OR WORKING SPEED.

7- With the controller configured, hold down the calibration button (Fig. 8.22) so that it starts the calibration test.



HOLD DOWN THE BUTTON TO COLLECT THE MAXIMUM AMOUNT OF PRODUCT, THE LARGER THE AMOUNT OF PRODUCT COLLECTED, THE MORE ACCURATE THE CALIBRATION TEST WILL BE.



IMPORTANT: AFTER COVERING THE FIRST HECTARE, VERIFY THAT THE DESIRED AMOUNT OF PRODUCT IS BEING USED.

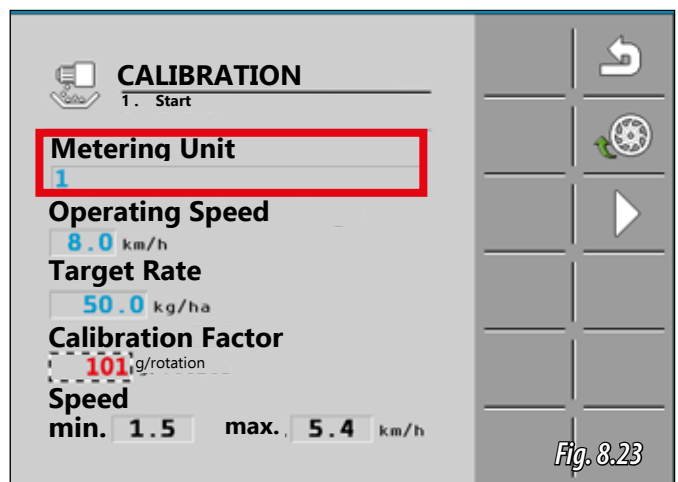


Fig. 8.23

8.1.3 ADJUSTING THE SEED DOSE - SEEDER MODEL

Using high-quality certified seeds is not enough to establish the weight in kilograms that has to be distributed with the machine, as the final crop result will depend on the number of plants that reach full maturity.

Each plant requires a given area of land, from which it will obtain nutrients. So, low plant density can be as bad as excessive density. To calculate the kilos per hectare to be sown, you need to know the number of plants per square metre that you are going to sow.

For guidance, the number of recommended plants for wheat and barley on unirrigated land is as follows:

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

The seed dose must be suitable for each type of land, depending on its texture, fertility level, rainfall and the sowing time, quality of the seed, germination capacity and tillering capacity, etc.

You must also bear in mind that the germination capacity of a seed is variable and depends on numerous factors. From experience, it can be estimated at between 70% and 80% which, in practice, is equivalent to multiplying the number of seeds being sown by 1.43 or 1.25 respectively.

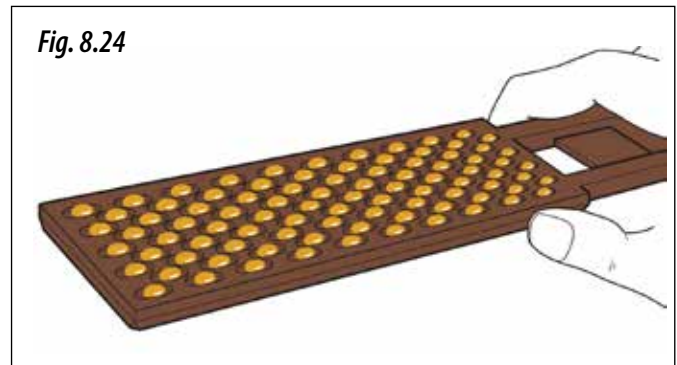


NOTE THAT THERE IS REDUCED TILLERING IN THE SPRING, SO THE QUANTITY THAT IS SOWN MUST BE INCREASED.



MAQUINARIA AGRÍCOLA SOLÀ, S.L. RECOMMENDS THAT THE FARMER GETS PROFESSIONAL ADVICE FROM EXPERTS OR SPECIALISTS IN THIS AREA.

There follows a practical method for determining the kilos per hectare that should be distributed based on the number of plants per square meter that you want to obtain.

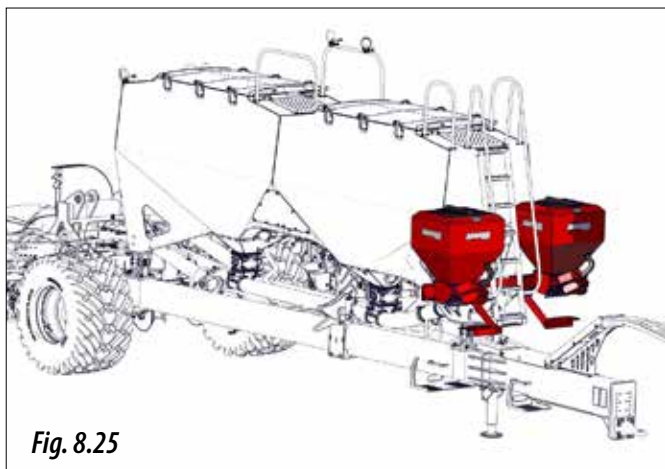


- 1- Place the «seed counter» (Fig. 8.24) in the sack of seed to fill it.
- 2- When you remove it, run your hand over it so that each slot only has one seed (100 seeds in total).
- 3- Repeat this process 10 times to obtain 1,000 seeds.
- 4- Weigh the 1,000 seeds on a precision scale.

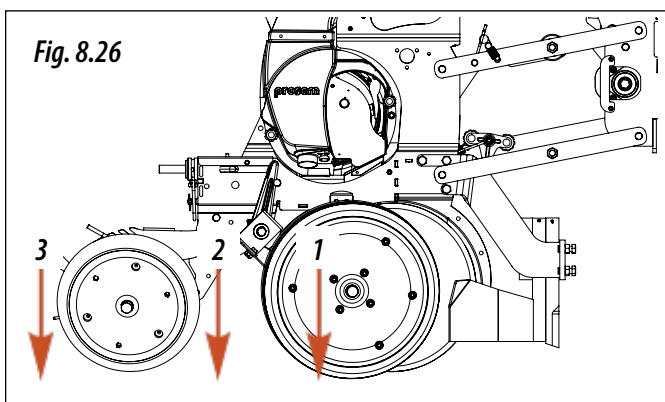
The weight obtained in **GRAMS** is called the **OPERATING WEIGHT**. Now that you know how many grams you are going to sow per square meter, dosage control should be set to the following number of kilos per hectare:

$$\text{KILOS PER HECTARE} = \frac{(\text{seeds per m}^2 \times \text{OPERATING WEIGHT})}{100}$$

8.2 CENTRALISED MICRO GRANULAR OR INSECTICIDE



Take into account that there is a wide variety of products with their different densities and irregular granulometries, therefore it is important to carry out prior dosage tests before beginning work.

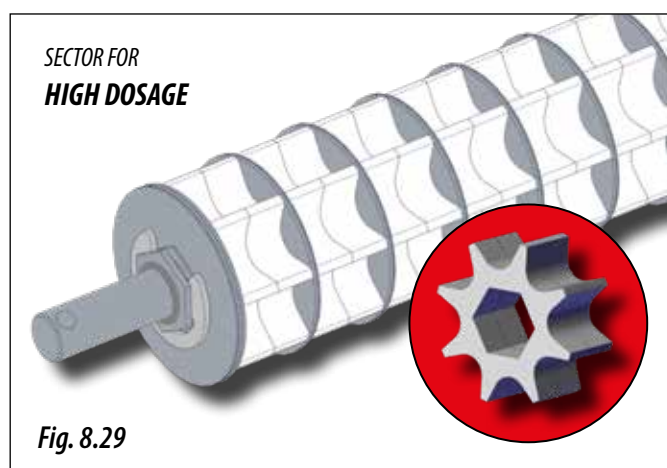
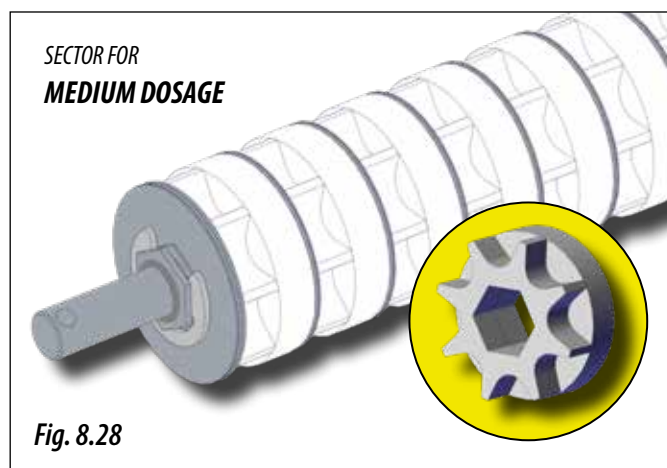
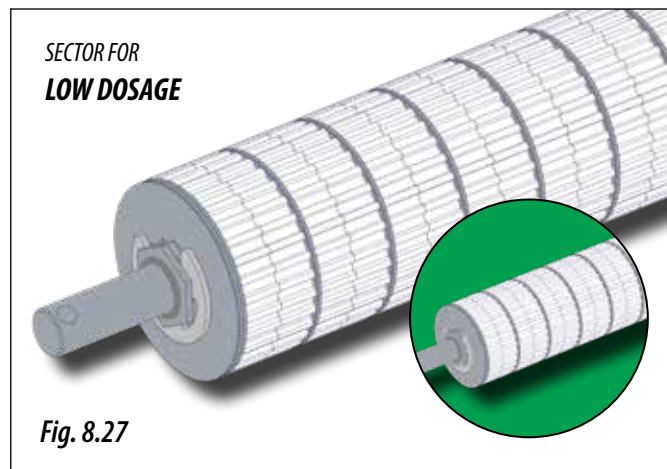


The **MICROGRANULAR FERTILISER** is deposited together with the seed (1, Fig. 8.26).

Depending on the options installed in the machine the **INSECTICIDE** can be deposited at 2 points according to the what is needed:

- SEMI-SUPERFICIAL (2, Fig. 8.26).
- SUPERFICIAL (3, Fig. 8.26).

This centralised kit has a roller distributor which can be configured to LOW, MEDIUM and HIGH section dosages.



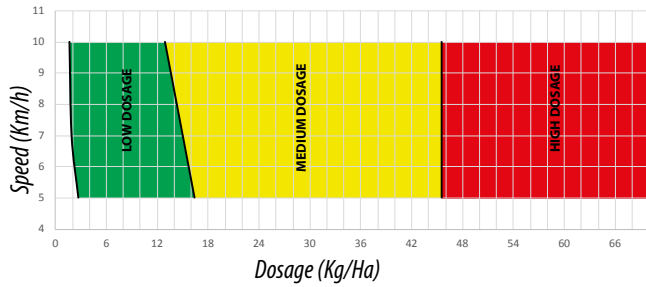
THE CENTRALISED KIT IS SUPPLIED WITH A SET OF ROLLERS WHICH FACILITATE THE DISTRIBUTION OF A WIDE VARIETY OF PRODUCTS AT DIFFERENT DOSAGES ACCORDING TO THE SPECIFIED DIAGRAMS IN THIS MANUAL.

The following diagrams show the type of roller to work with according to:

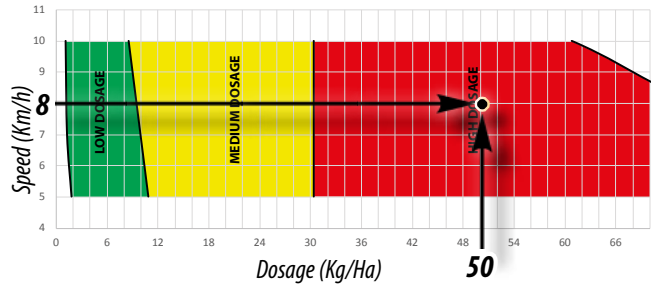
- A.** Distance between rows
- B.** Operating speed
- C.** Dosage in desired Kg/Ha.

EXAMPLE: For a machine with a distance between rows of **60 cm**, an operating speed of **8 Km/h** and a desired product dosage of **50 Kg/Ha**. We would set the roller to **HIGH DOSAGE** (Fig. 8.29) according to what is shown in section 8.2.1 CHANGING THE ROLLER.

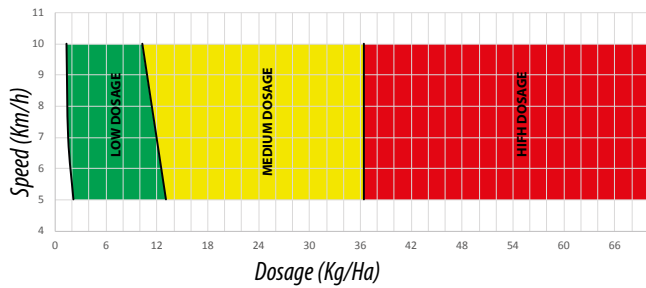
40 cm BETWEEN ROWS



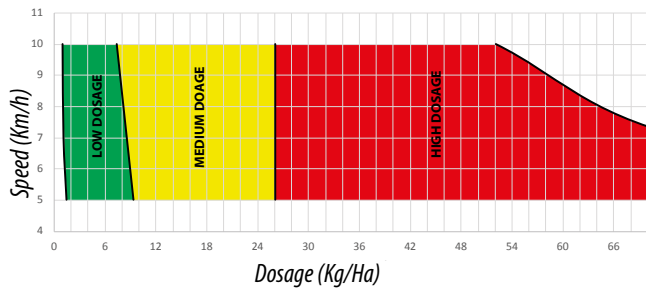
60 cm BETWEEN ROWS



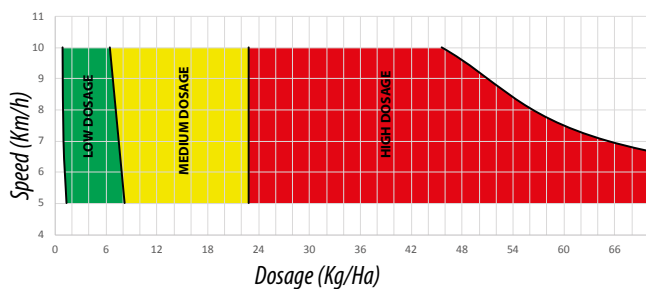
50 cm BETWEEN ROWS



70 cm BETWEEN ROWS



80 cm BETWEEN ROWS



8.2.1 CHANGING THE ROLLER

In the event that the distributed product needs to be changed and the dosage needs to be changed from high to low or vice versa, the sections of the distributor roller will have to be changed, this is done in the following way:

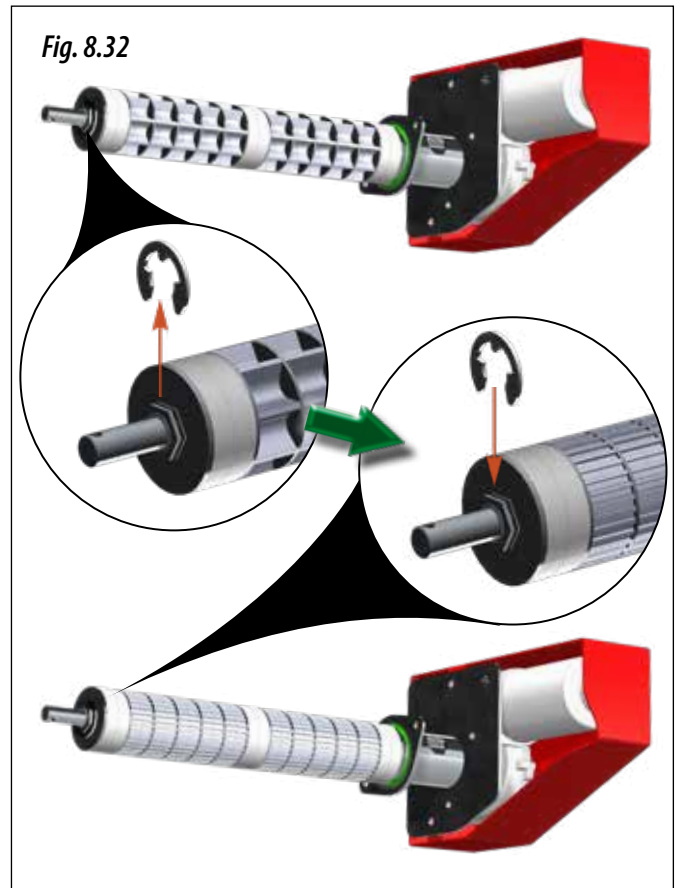
- 1- Remove the pin (A, Fig. 8.30).



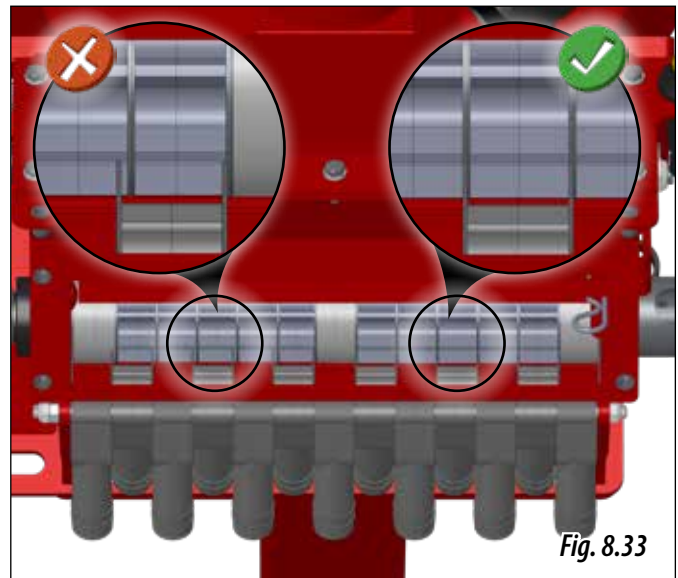
- 2- Take the security nuts off from the motor side (B, Fig. 8.31).



- 3- Disconnect the electric motor cable.
- 4- Remove the motor and the roller. To change the detachable rollers, the Seeger ring must be removed. 8.32).
- 5- Assemble the components which correspond to the product to be distributed (the images correspond to a change from a HIGH DOSAGE product to a LOW DOSAGE product).



- 6- Present the roller and motor combination in the hopper to make sure that the ROLLER SEPARATORS line up with the EXIT SEPARATORS (Fig. 8.33)



- 7- Once the correct assembly of the roller separators is verified, tighten the nuts (B, Fig. 8.31) and insert the pin (A, Fig. 8.30).



IMPORTANT: PUT THE CAPS ON THE EXITS THAT ARE NOT USED (example: *1, *7 and *13, Fig. 8.34).



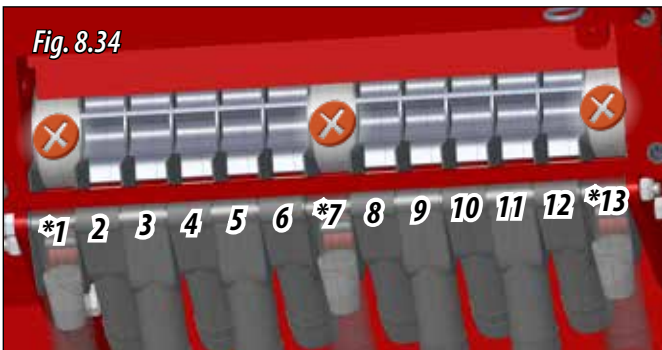
IMPORTANT: PUT BLOCKING SECTORS IN THE EXITS THAT ARE NOT USED. MACHINE COULD BE DAMAGED IF THIS IS NOT DONE (example of machine with 10 working parts, Fig. 8.34).



THE EXITS THAT ARE NOT USED MUST LINE UP WITH THE BLOCKING SECTORS AND CAPS.



IMPORTANT: THE ROLLER MUST BE CHANGED ONLY WHEN THE HOPPER IS EMPTY.



8.2.2 CALIBRATION TEST



A PRIOR CALIBRATION TEST MUST BE CARRIED OUT BEFORE BEGINNING WORK AS WELL AS FREQUENT CHECKS.



CARRY OUT THE CALIBRATION TEST WITH THE FAN TURNED OFF COMPLETELY.



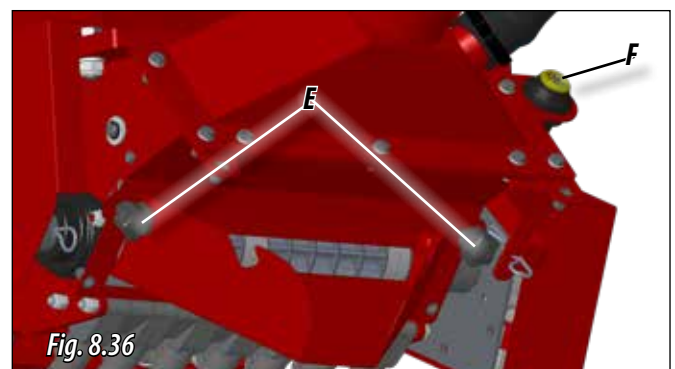
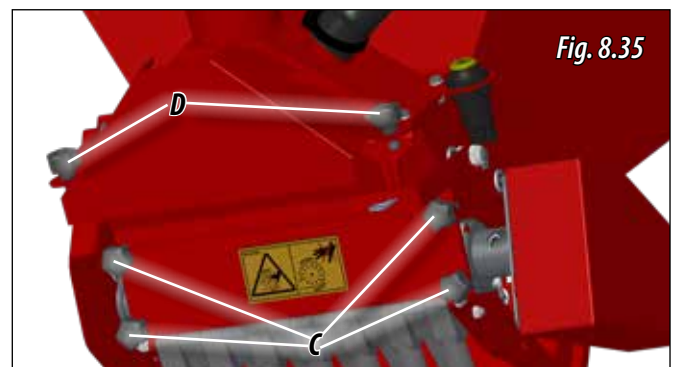
IMPORTANT: CHOOSE THE MOST APPROPRIATE ROLLER SETTING FOR THE JOB, TO DO THIS, THE FOLLOWING MUST BE TAKEN INTO ACCOUNT: DISTANCE BETWEEN ROWS, OPERATING SPEED AND THE DOSAGE OR RATE IN KG/HA DESIRED (SEE SECTION 8.2 CENTRALISED MICROGRANULAR OR INSECTICIDE).



IN THE EVENT THAT THE ROLLER MUST BE CHANGED, SEE SECTION 8.2.1 CHANGING THE ROLLER.

For product calibration, follow these steps:

- 1- Fill the hopper with the product. To do this the cap must be turned to extract it and then fill it and close the cap.
- 2- Remove the CALIBRATOR GATE, to do this the two knobs must be removed (C, Fig. 8.35).
- 3- Remove the CALIBRATOR CONE knobs (D, Fig. 8.35) and put the cone in position for calibration, fixing the cone with the knobs (E, Fig. 8.36).



- 4- Place a container beneath the calibration cone.
- 5- Use the ISOBUS machine controller to run the test, see the specific manual for ISOBUS.



THE CALIBRATION TEST MUST BE RUN FOR THE TWO DISTRIBUTORS.



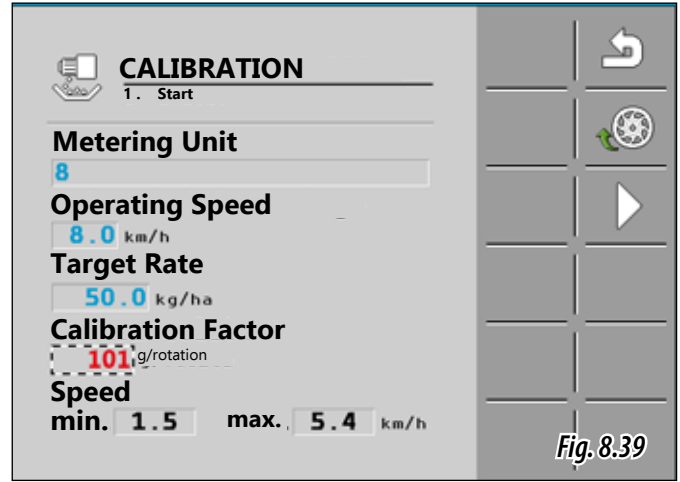
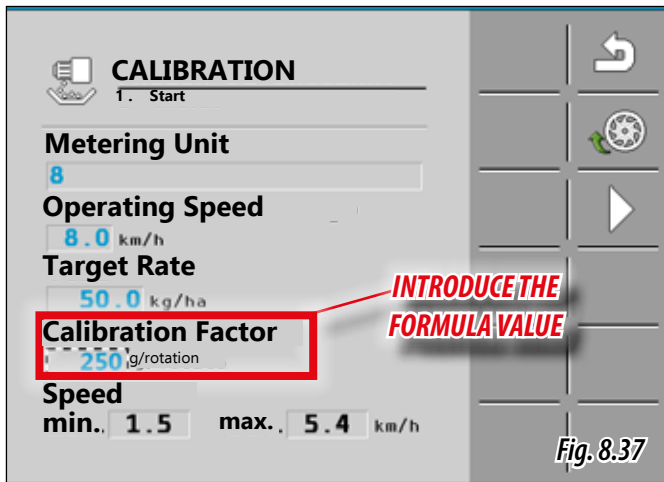
A VALUE FOR THE CALIBRATION FACTOR MUST BE INTRODUCED. IF THE FACTOR IS NOT CORRECT THE CALIBRATION MAY NOT BE CARRIED OUT.



IF THE SPECIFIC WEIGHT OF THE PRODUCT IS UNKNOWN, USE THE VALUE 1.

EXAMPLE: For a machine with **7 rows**, a product with a specific weight of **0.90 Kg/L** and the roller set to **HIGH DOSAGE**. We calculate the **CALIBRATION FACTOR AS:**

$$\text{Calibration factor.} = 7 \times 0.90 \times 16 = 100.8 \approx \mathbf{101}$$

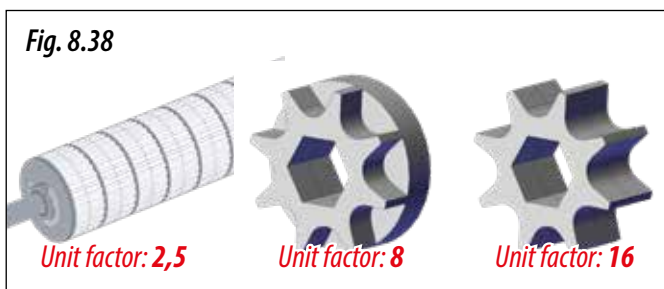


From the following formula the calibration factor to introduce into the monitor can be obtained according to: the number of rows, the specific weight of the product (Kg/L) and the unit factor which depends on the roller configuration).

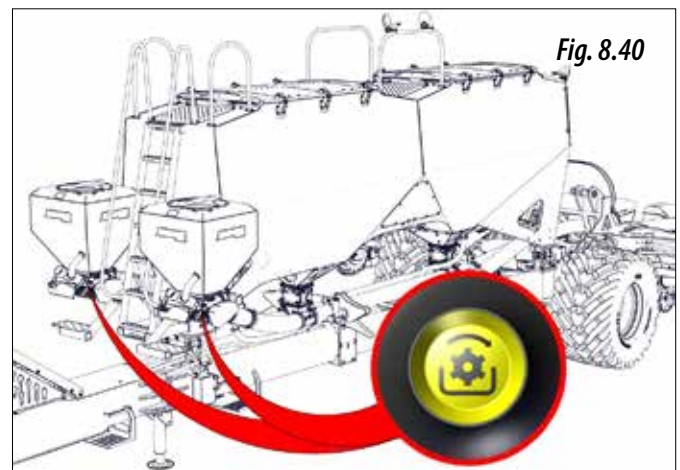
$$\text{Calibration factor.} = \text{No. rows} \times \text{Specific weight} \times \text{Unit factor}$$



THE UNIT FACTOR TO INTRODUCE INTO THE FORMULA IS 2.5 FOR LOW DOSAGES, 8 FOR MEDIUM DOSAGES AND 16 FOR HIGH DOSAGES (FIG. 8.38).

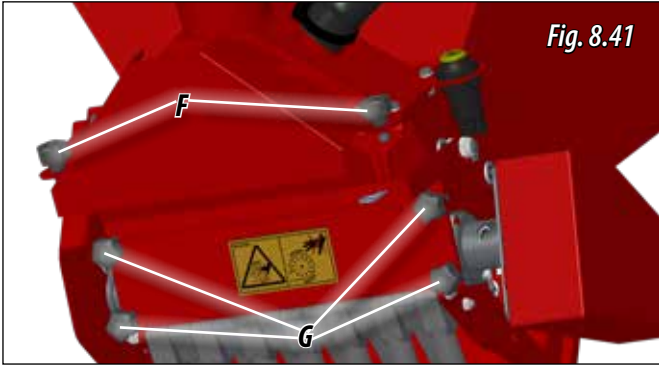


- 6- With the controller configured. Hold down the calibration button (Fig. 8.40) so that it starts the calibration test.



HOLD DOWN THE BUTTON TO COLLECT THE MAXIMUM AMOUNT OF PRODUCT, THE LARGER THE AMOUNT OF PRODUCT COLLECTED, THE MORE ACCURATE THE CALIBRATION TEST WILL BE.

- 7- Weigh the material collected in the container and enter the weighed value in the ISOBUS monitor.
- 8- Remove the CALIBRATOR CONE and keep it with the knobs (F, Fig. 8.41).
- 9- Put the CALIBRATION GATE back and fix it with the knobs (G, Fig. 8.41).



WHEN USING PRODUCTS OF FINE GRAIN, IT IS POSSIBLE THAT THE PRODUCT MAY DROP OUT UPON OPENING THE CALIBRATION GATE AND IF THE ROLLER IS NOT TURNED. IN THIS CASE THE GRANULOMETRY LEVER MUST BE ADJUSTED UPWARDS AND THEN FIXED WITH THE PIN (FIG. 8.42). MAKE SURE THAT THE BRUSH IS IN CONTACT WITH THE ROLLER.



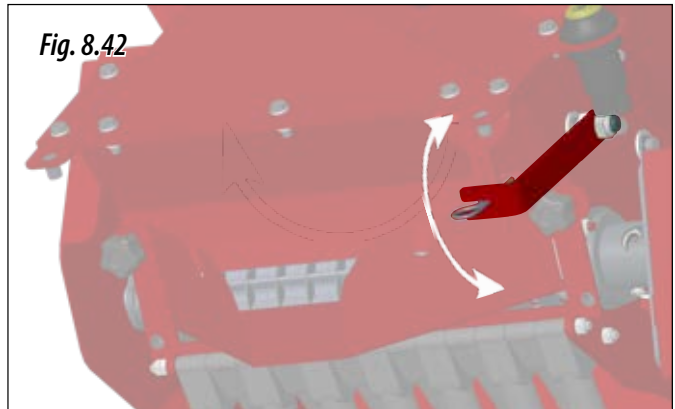
WHEN USING PRODUCTS OF LARGE GRAIN, IT IS POSSIBLE THAT AFTER CARRYING OUT THE CALIBRATION TEST, THE PRODUCT DOES NOT DROP OUT OR THAT IT DOES NOT DROP OUT EALISY. IN THIS CASE THE GRANULOMETRY LEVER MUST BE ADJUSTED DOWNWARDS AND THEN FIXED WITH THE PIN (FIG. 8.42). MAKE SURE THAT THE BRUSH IS IN CONTACT WITH THE ROLLER.



EVERYTIME THE DISTRIBUTOR CONFIGURATION IS MODIFIED OR THE PRODUCT IS CHANGED, A NEW CALIBRATION TEST MUST BE CARRIED OUT.



ONCE THE CALIBRATION TESTS ARE FINISHED, CLOSE THE CALIBRATION CAP.



8.2.3 PNEUMATIC SYSTEM - FAN



Fig. 8.43

2- Set the air flow rate via the tractor, set the fan speed (rpm) according to the desired dose.

DOSAGE (kg/ha)	FAN REVOLUTIONS (rpm)	PRESSURE (H ₂ O cm)
0-15	2000 - 3000	6 - 14
15-45	3000 - 4000	14 - 22

*The values of this table are indicative.



IN THE CASE THAT THE TURNING RATE CANNOT BE REGULATED FROM THE TRACTOR, ADJUST THE TURNING RATE FROM THE FAN VIA THE FLOW REGULATOR (FIG. 8.44).

3- Always carry out a visual inspection to ensure that product does not remain accumulated in the transport tubes. If this occurs, increase the rate of the fan.



ACCORDING TO THE NUMBER OF ROWS AND THE PRODUCT DOSAGES PER HECTARE THAT YOU WISH TO WORK, ADJUST THE AIRFLOW THAT GENERATES THE FAN.

To adjust the pneumatic system, proceed as follows:

1- Open the flow regulator on the fan full-scale (Fig. 8.44).

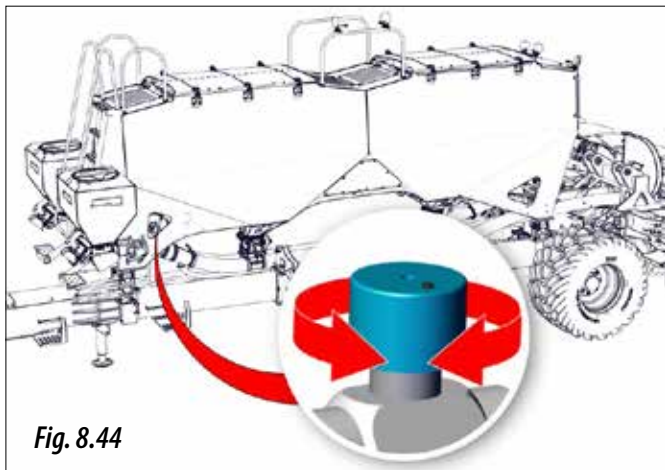


Fig. 8.44



IT IS RECOMMENDED TO WORK WITH THE MINIMUM AIRFLOW POSSIBLE, WITHOUT MATERIAL REMAINING IN THE TUBES, WHICH COULD BLOCK THE PNEUMATIC SYSTEM.



IN THE CASE THAT PRODUCT ACCUMULATES IN THE TRANSPORT TUBES (FIG. 8.45), INCREASE THE HYDRAULIC FLOW OF THE FAN UNTIL THE SURROUNDING AIR REMOVES THE ACCUMULATED MATERIAL.

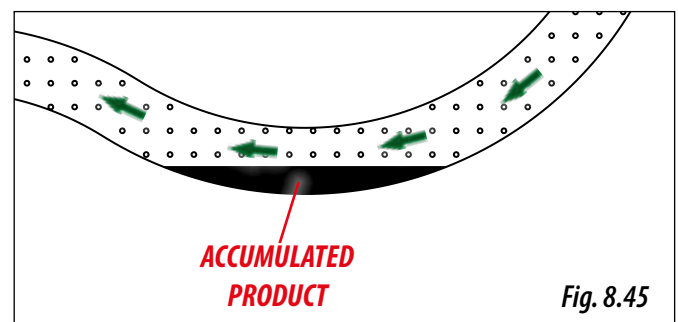


Fig. 8.45

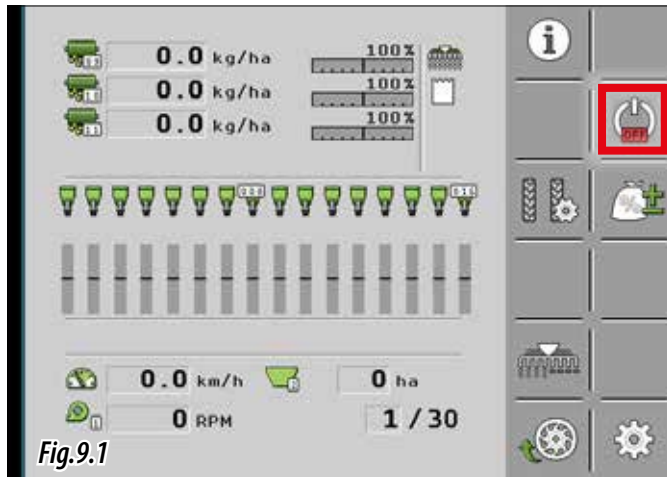


CHECK AT OPERATING SPEEDS AND DOSAGES THAT MATERIAL DOES NOT ACCUMULATE IN THE TUBES.

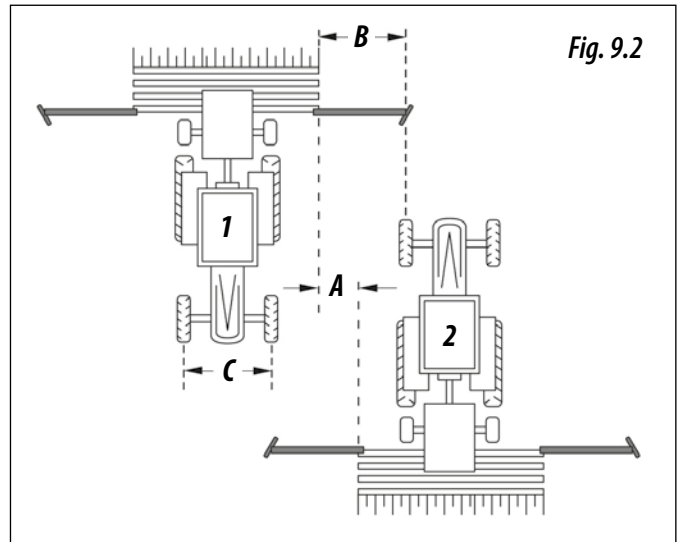
9. ADJUSTING THE MARKERS

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

To UNFOLD and FOLD up the markers, deliver pressure to the hydraulic circuit with the application turned on (APP ON) (Fig. 9.1).



Track marker's arms are extensible. To calculate the horizontal spacing between track discs and the last metering unit (B, Fig. 9.2), use following formula:



$$B = \frac{A \times (\text{number of rows} + 1) - C}{2}$$

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.

WHERE:

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



DISTANCE **B**, CALCULATED WITH THE ABOVE FORMULA, IS THE SET LENGTH TO THE CENTRE OF THE TRACTOR'S WHEEL (FIG. 6.91).



PERFORM THE CALCULATION WITH THE MEASUREMENTS EXPRESSED IN CENTIMETRES.



SET THE WORKING LENGTH TO THE PREVIOUSLY CALCULATED DISTANCE **B**. (**B** = DISTANCE BETWEEN THE MARKER'S DISC AND THE FINAL SOWING ARM THAT IS CLOSEST TO THE MARKER)

This adjustment allows you to keep the same row spacing A between a length with the planter (1, Fig. 9.2) and its return (2, Fig. 9.2).

Once the distance B has been calculated, the length of the track marker's support can be adjusted:

- 1- With the application off (APP OFF), unfold the chassis and distributor heads (Fig. 9.3) until the sowing units touch the ground.

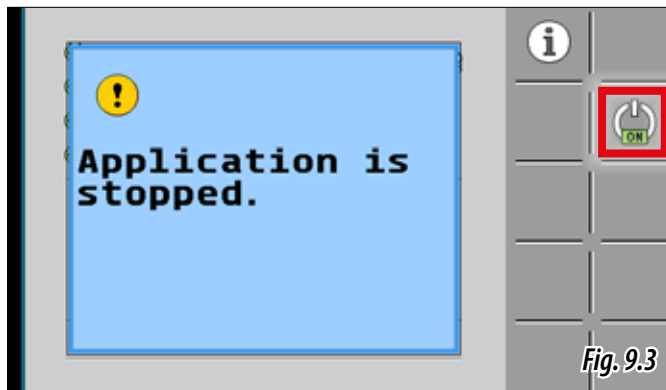


Fig. 9.3



WE RECOMMEND UNFOLDING THE MARKERS TO DETERMINE THEIR CURRENT LENGTH AND THEN FOLDING THEM BACK UP TO SET THE WORKING DISTANCE.

- 2- To place the marker disc to the previously calculated distance B, loosen the disc's screws (Fig. 9.4). If this is not enough, loosen the screws in the extendable tube (Fig. 9.5).
- 3- When the marker disc is in the desired position, properly tighten all of the screws.

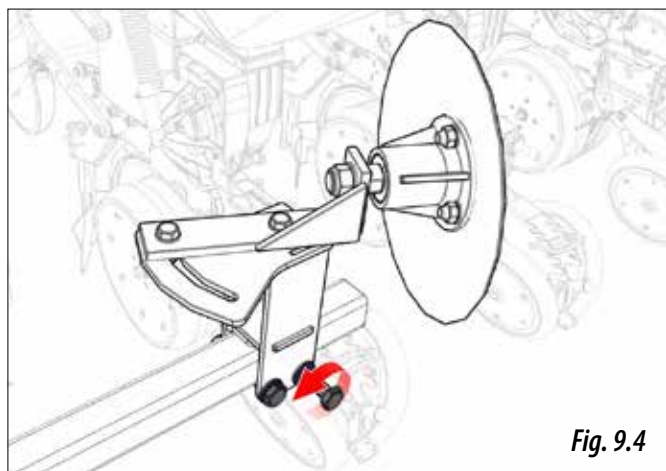


Fig. 9.4

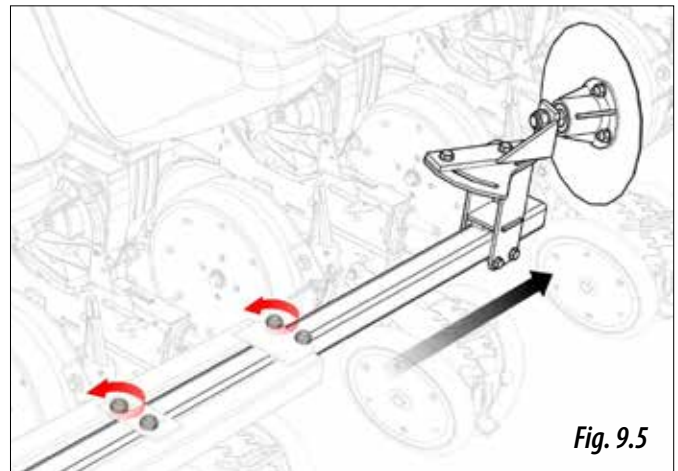


Fig. 9.5

Adjust the direction of the marker disc by loosening the screws (Fig. 9.6) to increase or decrease the disc's impact on the ground. Tighten the screws when you have completed this process.

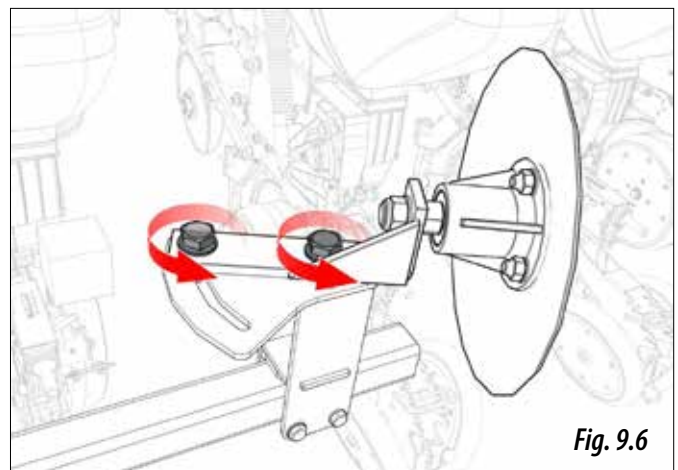


Fig. 9.6

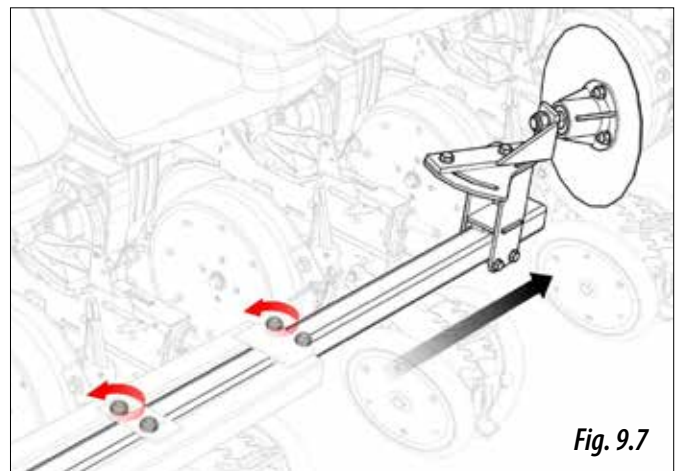


Fig. 9.7



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

10. 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.

10.1 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 planter. Perform this check without any seeds 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 planter which are permanently in contact with seeds, 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 cleaning the planter with pressurised area, make sure that there are no seeds or fertiliser left in the hoppers.

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 pneumatic system.

- END OF SOWING SEASON

Clean the machine properly with pressurised air. Make sure that no seeds, fertiliser or other products have been left in the hoppers or pipes. Take special care to clean any parts that come into contact with chemicals.

Properly lubricate the moving parts of the planter.

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.



KEEP THE SOWING EQUIPMENT CLEAN. THE ACCUMULATION OF EARTH, STONES, GRASS, ETC. MAY BLOCK THE SOWING DUCTS.

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:



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.

AREA WORKED ON	TASK TO BE PERFORMED	NUMBER OF HOURS				
		10	20	50	100	500
Machine components	Greasing of all components (rods, shafts, hubs, etc.)			•		
	First inspection of all bolted joints	•				
	Screws in general (after the first inspection)				•	
Drive wheels	Tyre pressure check				•	
	Replace transmission fuse (according to model)					•
Chain drives	Lubricate drive chains (according to model)			•		
	Adjust tension of drive chains (according to model)				•	
Gearbox	Change oil (according to model)	Every 3 years				

10.2 SCREWS

All of the planter's fasteners must be checked and re-tightened if necessary.



AFTER THE MACHINE'S INITIAL 10 HOURS OF OPERATION, THE SCREWS SHOULD BE TIGHTENED.

If you have to remove wheels to change tyres or for any other reason, when re-fitting them on the machine the screws should be tightened as per the table below:

TYRES	TIGHTENING TORQUE (Nm)
650/50 R22.5	350 - 380
560/60 R22.5	350 - 380
400/60-15.5 16PR	270 - 290
23x8.50 - 12 6PR	160 - 175

10.3 MACHINE CLEANING

The planter must be cleaned with pressurised air; it must not ever be washed with water.

During work, foreign objects may clog up parts of the machine. Remove any foreign objects and check for any damage.



EVERY TIME THE SEED HOPPER IS CLEANED USING COMPRESSED AIR, USE PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE).



CLEAN THE DISPENSERS WHEN THEY ARE NO LONGER BEING USED.



IMPORTANT: FOR PLANTER VERSIONS OF THE MACHINE, INSPECT THE 2 SUCTION BELLOWS AND KEEP THEM CLEAN. THERE IS ONE ON EITHER SIDE OF THE MACHINE (FIG. 10.1). A BUILD-UP OF SEED OR DUST RESIDUE CAN CLOG UP THE PNEUMATIC SYSTEM.

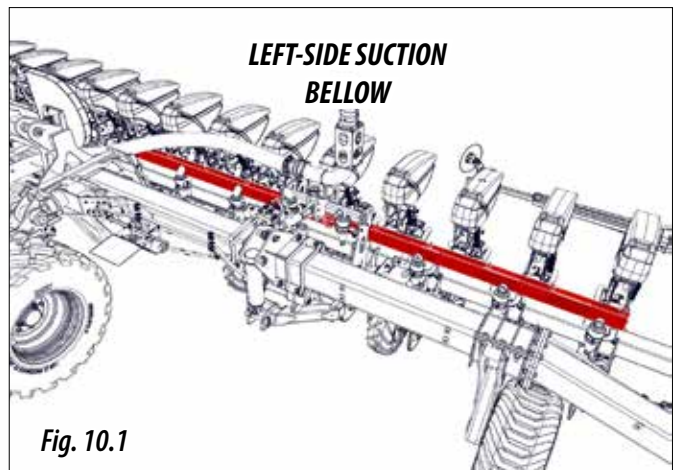
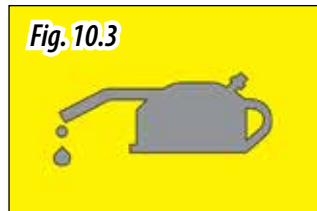
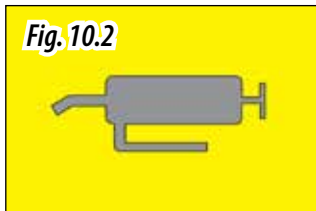


Fig. 10.1

10.4 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 (Fig. 10.2) or the points to be LUBRICATED (Fig. 10.3).



THE PLANTER HAS SEVERAL GREASING POINTS. FAILING TO FOLLOW THESE GREASING INSTRUCTIONS MAY RESULT IN THE MACHINE BEING DAMAGED.



BEFORE LUBRICATING OR GREASING, WASH THE PLANTER TO REMOVE EARTH RESIDUES ATTACHED TO THE MACHINE).



DO NOT GREASE OR LUBRICATE THE SEED OR FERTILISER DISPENSER.



USE CALCIUM-BASED HEAVY DUTY GREASE FOR THE PARTS BEING GREASED.

LUBRICATE the drive chains (according to model).



ALWAYS USE HIGH PERFORMANCE OIL TO GET A RELIABLE LUBRICATION.

10.5 TYRE PRESSURE

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

Generally, and on poorly prepared ground, we recommend slightly reducing the pressure in the tyres to offset any unevenness in the ground and ensure more even sowing.



IMPORTANT: KEEP THE MACHINE'S TYRES IN A GOOD CONDITION.



IMPORTANT: WHEN TRANSPORTING THE MACHINE ON HIGHWAYS OR PUBLIC ROADS, THE AIR PRESSURE IN THE TYRES MUST BE AS SHOWN ON THE FOLLOWING TABLE. OTHERWISE, THE MACHINE MAY BE DAMAGED.

TYRE TYPE	AIR PRESSURE (bar)	AIR PRESSURE (PSI)
650/50 R22.5	5	73
560/60 R22.5	5	73
400/60-15.5 16PR	4.4	64
23x8.50 - 12 6PR	2.35	34

GREASE the following points:

- Markers.
- The hubs of the machine's drive and depth control wheels.
- Joints.
- Sowing units.
- Transmission components (according to model).

10.6 AUTOMATIC GEARBOX (according to the model)

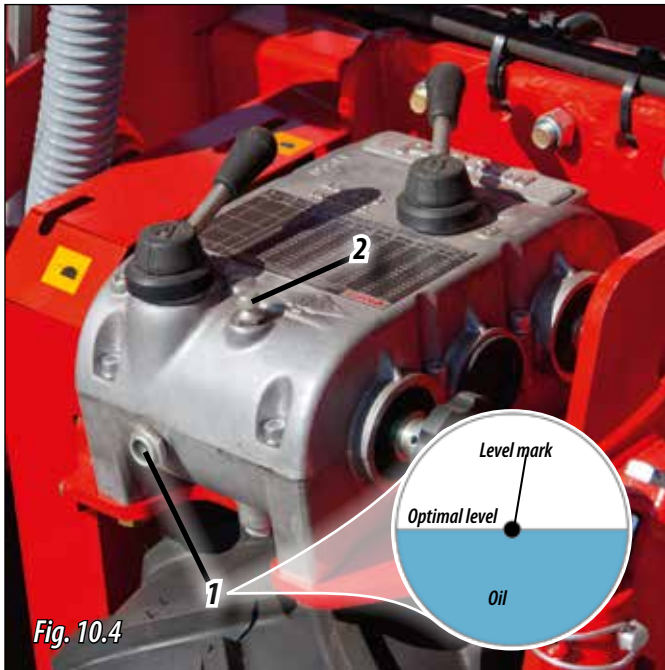
Periodically check the oil level of the gearbox using the oil sight glass (1, Fig. 10.4).



WHEN THE OIL LEVEL REACHES THE MARK IN THE CENTRE OF THE OIL SIGHT GLASS, THAT MEANS THAT THE OIL LEVEL IS OPTIMAL (Fig. 10.4).

To fill the oil tank:

- 1- Remove the cap (2, Fig. 10.4)
- 2- Fill the tank. Check the level using the oil sight glass (1, Fig. 10.4).
- 3- Place the cap back.



IT IS RECOMMENDED TO CHANGE THE OIL EVERY 5 YEARS, REGARDLESS OF THE USE OF THE PLANTER. TO CHANGE THE OIL, ALWAYS USE OIL TYPE SAE 30 (APPROXIMATELY 2 LITRES).

10.7 FANS



KEEP THE AIR OUTLETS FREE.



BEFORE STARTING THE SOWING SEASON, CHECK THAT THE DUCTS OF THE AIR CIRCUIT ARE IN GOOD CONDITION.



ALWAYS KEEP THE HYDRAULIC CONNECTIONS IN GOOD CONDITION. THE PRESSURE OF THE HYDRAULIC CIRCUIT MAY CAUSE SERIOUS DAMAGE TO PERSONS. PRESSURE LOSSES IN THE HYDRAULIC CIRCUIT WILL RESULT IN A LACK OF SEEDS IN THE SEED DISC.

10.8 ELECTRONICS



IF THERE ARE ANY PROBLEMS, CHECK THE FUSES (FIG. 10.5).



IF THERE IS A BAD CONNECTION BETWEEN CONNECTORS, APPLY ELECTRICAL CONTACT CLEANER.



WHEN CHANGING A FUSE, IT MUST BE REPLACED BY ANOTHER WITH THE SAME AMPERAGE.



IF AN ERROR IS DISPLAYED ON THE ISOBUS MONITOR'S SCREEN, VIEW THE ALARM ID NUMBER AND TEXT TO FIND THE POSSIBLE CAUSES AND SOLUTIONS DETAILED IN THE ALARM SECTION OF THE ISOBUS'S MANUAL.



CHECK THAT ALL OF THE CONNECTIONS ARE OK AND THAT THE CABLES HAVE NOT BEEN CUT.

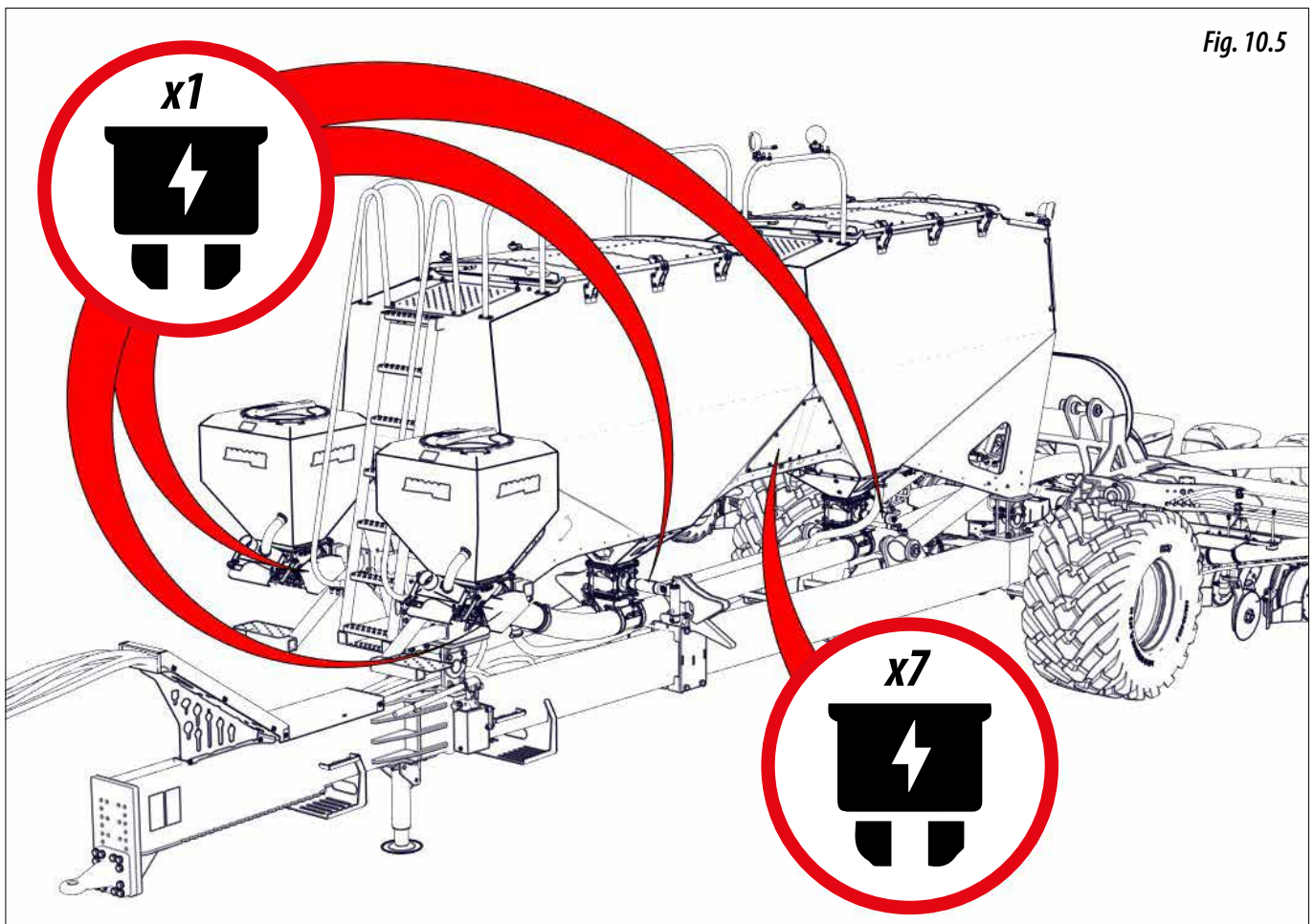


Fig. 10.5

11. CHANGING UNITS

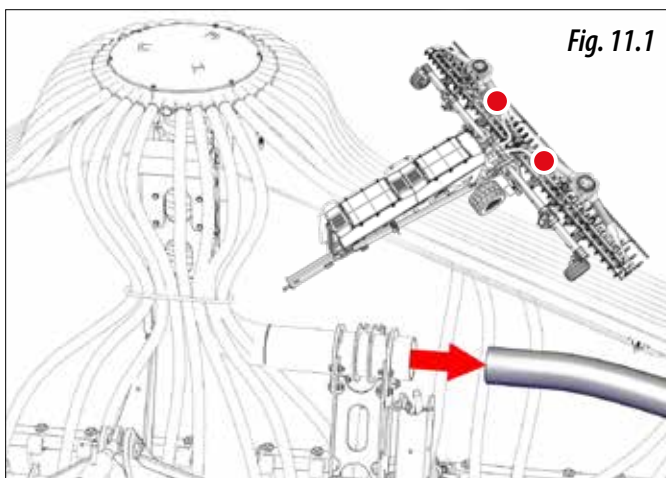
11.1 CHANGING FROM ARGO CEREAL TO ARGO SINGLE-SEED

To change the machine settings, follow the steps below:

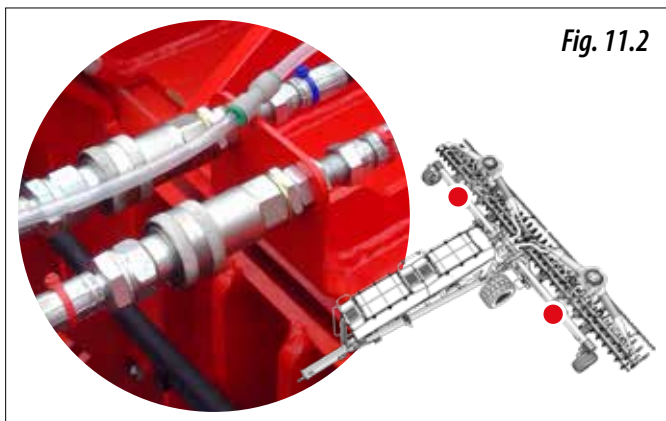


IMPORTANT: THIS TASK MUST BE PERFORMED WITH THE MACHINE IN OPERATING POSITION AND BOTH TRACK MARKERS UNFOLDED.

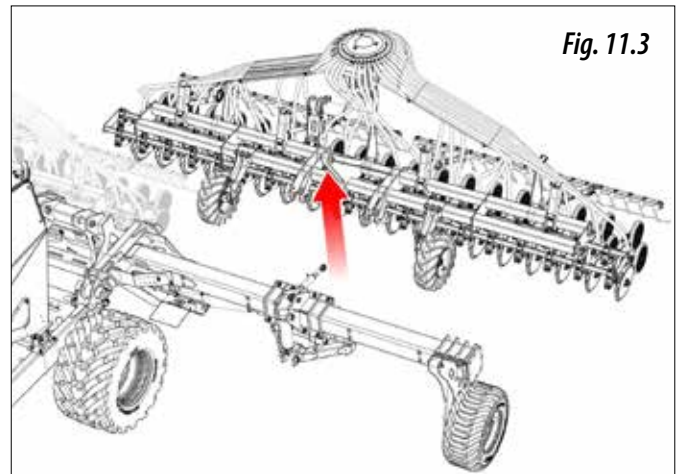
1. Disconnect the pipe from each cereal coulters unit's distribution head.



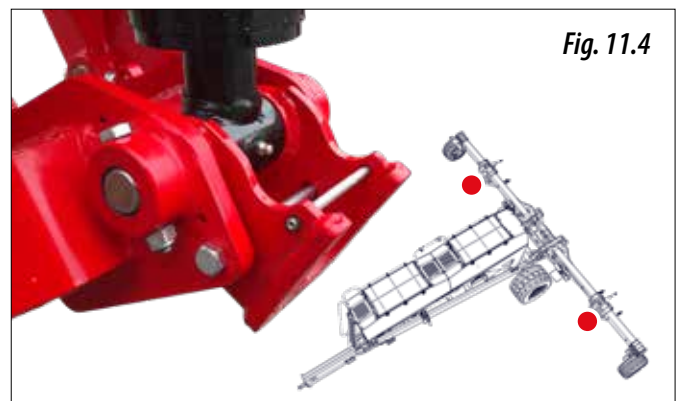
2. Disconnect the distribution heads' hydraulics.



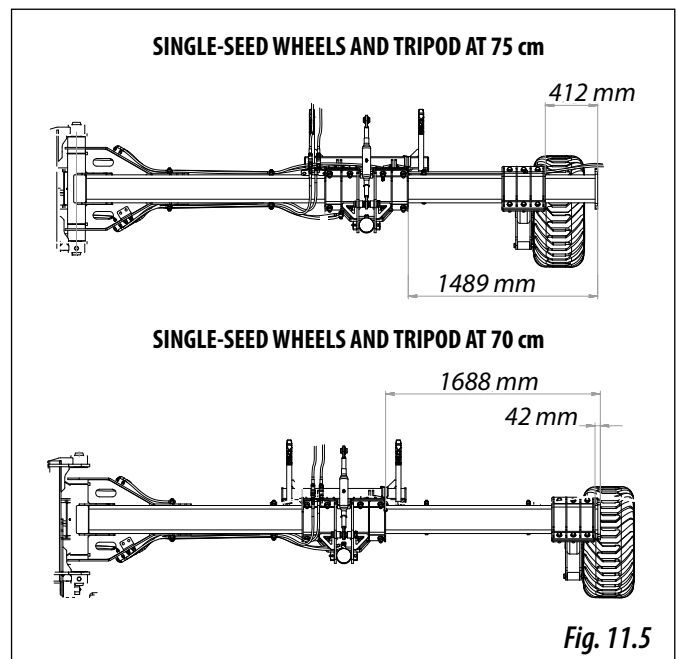
3. Uncouple the cereal units at the three-point hitch.



4. Remove the cylinder stop; this is located on the three-point hitches on both wings of the machine.

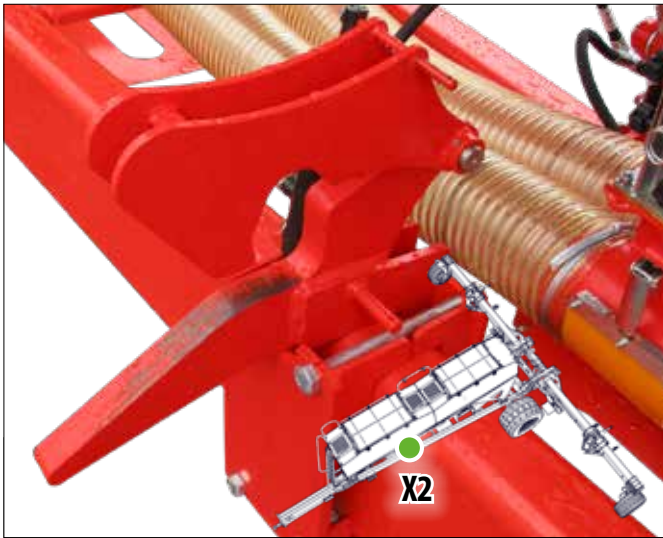


5. Relocate the wing tripods and/or floating wheels as shown in the figures.

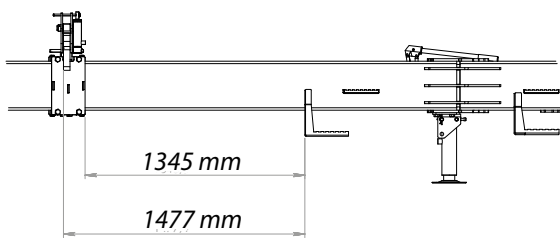




IMPORTANT: IF THE FLOATING WHEELS ARE MOVED, THE WINGS' HYDRAULIC LOCKING LATCHES MUST BE RELOCATED; THEY ARE LOCATED ON THE MACHINE CHASSIS.



SINGLE-SEED MACHINE LOCKING LATCHES AT 75 cm



SINGLE-SEED MACHINE LOCKING LATCHES AT 70 cm

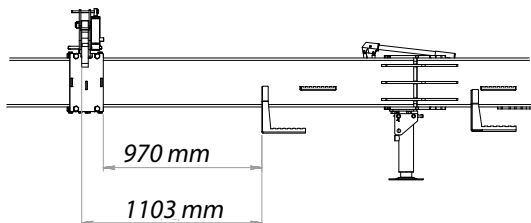


Fig. 11.6

6. Couple the single-seed units at the three-point hitch.

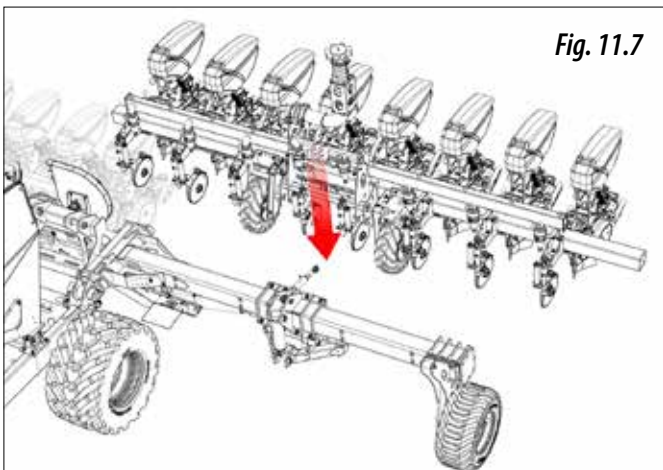


Fig. 11.7

7. Level the coulter unit using the third point's adjuster.

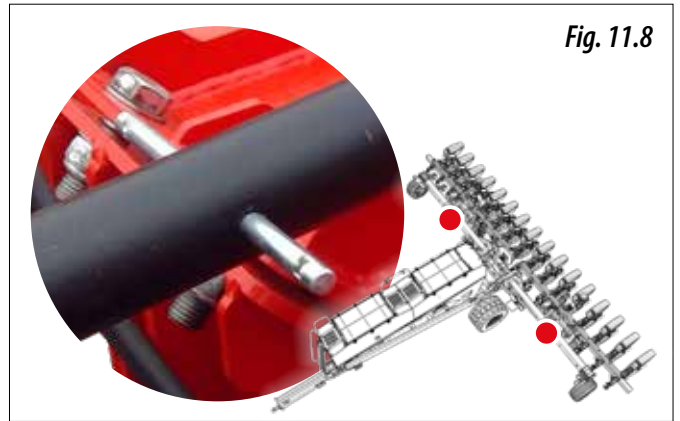


Fig. 11.8

8. Connect the distribution heads' hydraulics and the suction sensor tube.

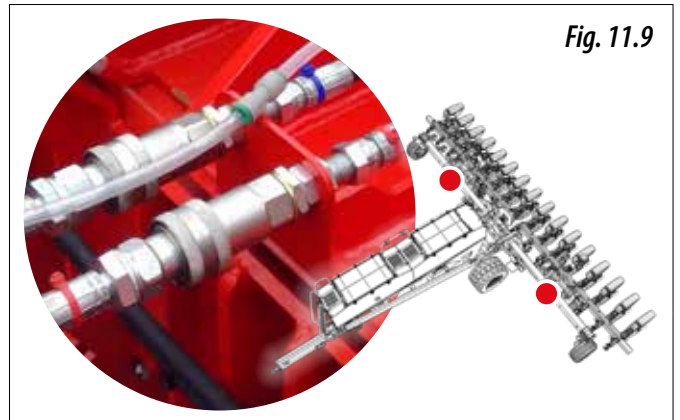


Fig. 11.9

9. Connect the product feed pipe from the hoppers to the single-seed units' distribution heads.

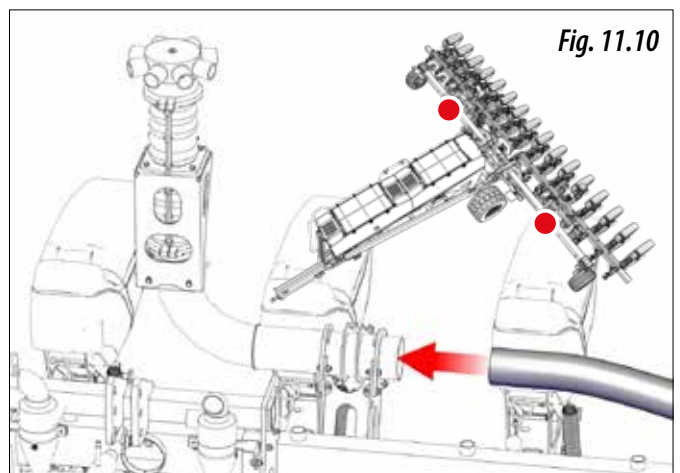
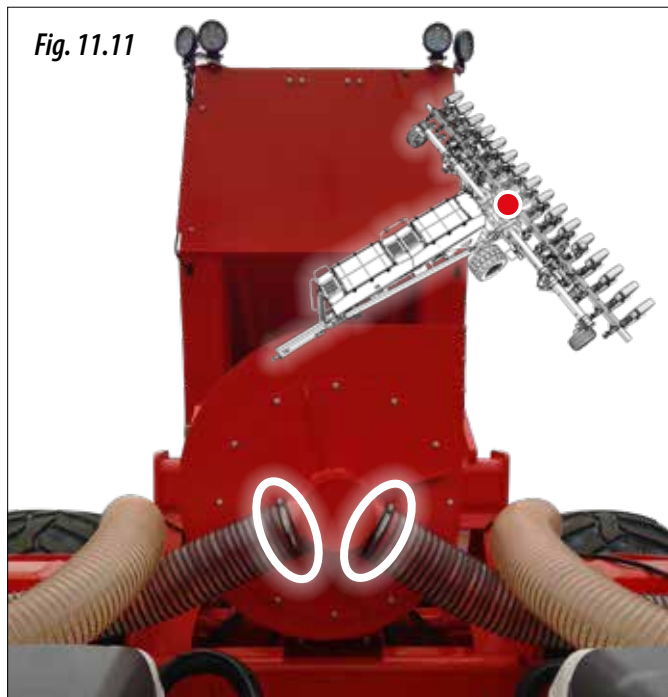
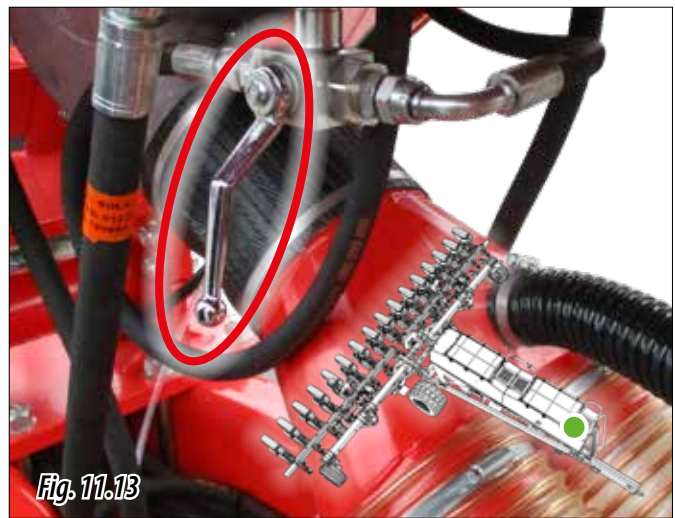


Fig. 11.10

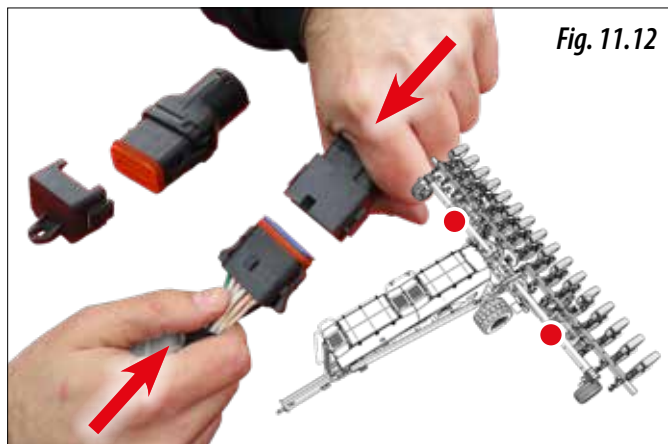
10. Mount the suction hoses of the single-seed units on the turbine.



14. Open the alternator's hydraulic circuit, the shut-off valve is located next to the hydraulic turbine.



- 11. If the machine has microgranulate, connect the microgranulate product feed pipes to the single-seed coulters units.
- 12. Connect the wiring, one cable for each single-seed unit; put the connector plugs in a safe place.



15. Proceed as follows to configure the ISOBUS application:



13. Set the 2 dispensers' gate (see section 8.1 LARGE-CAPACITY HOPPERS).

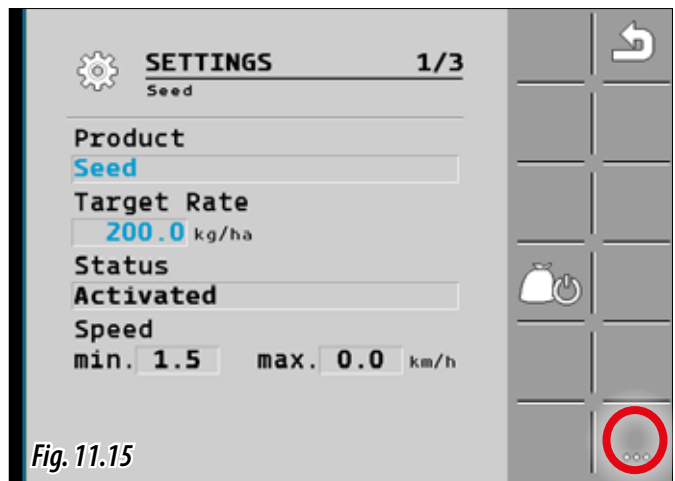




Fig. 11.16

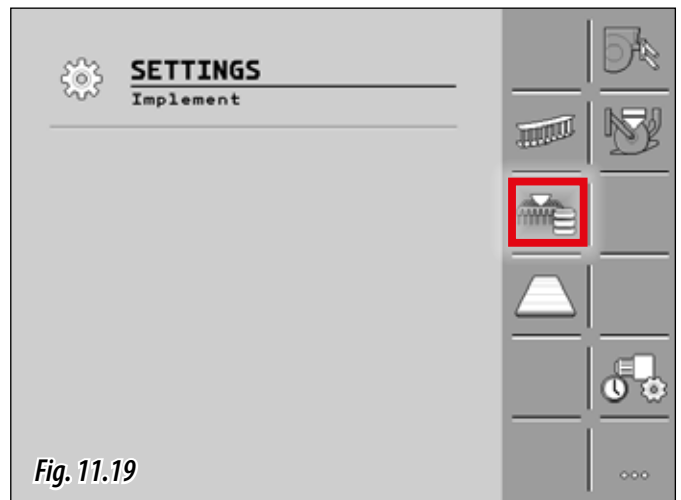


Fig. 11.19

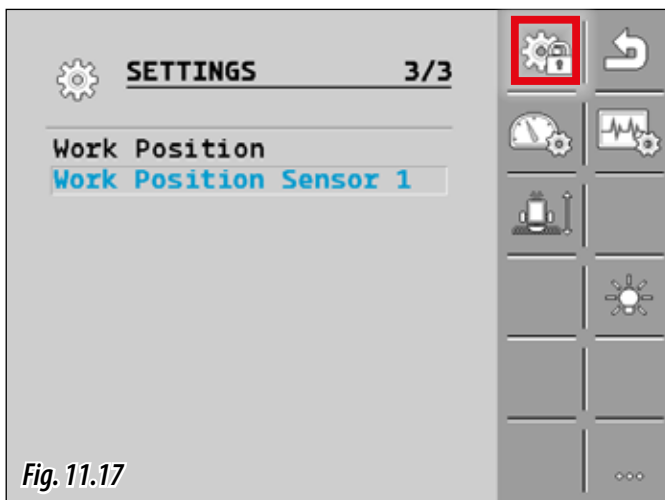


Fig. 11.17

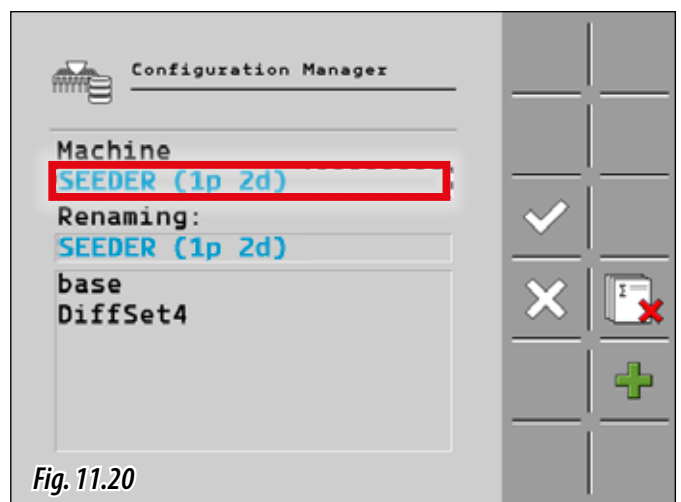


Fig. 11.20

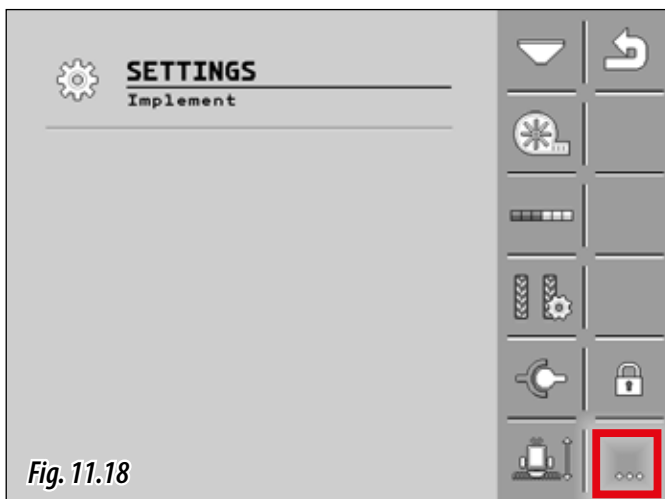


Fig. 11.18

16. The window with the machine's current settings opens; in this case, **cereal seed drill 1 product in 2 dispensers** (Fig. 11.21).

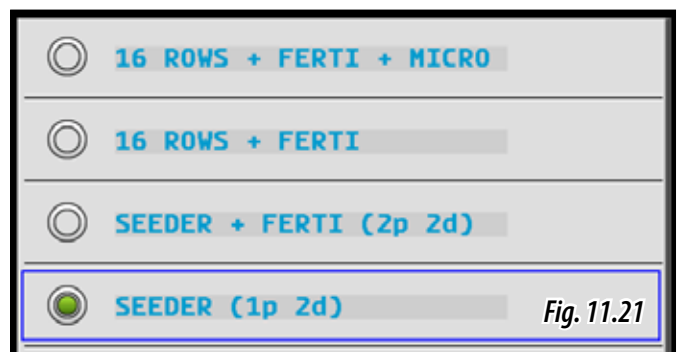


Fig. 11.21

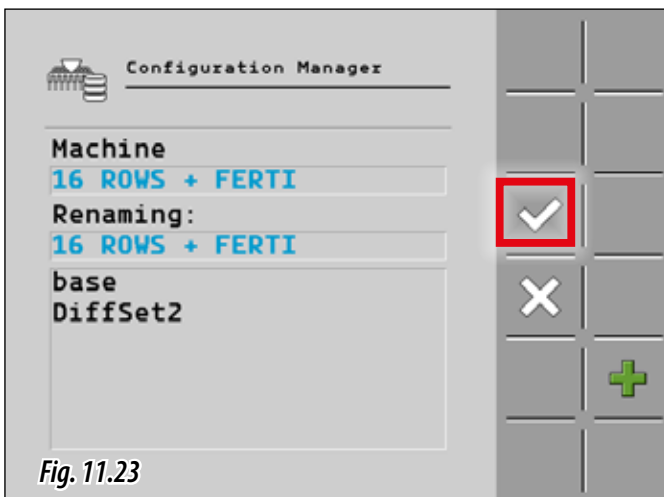
17. Select the desired settings, which can be:

- **16 ROWS + FERTI + MICRO:** Single-seed machine with fertilizer and microgranulate.
- **16 ROWS + FERTI:** Single-seed machine with fertilizer.

In this case, the setting **single-seed seed drill with fertilizer** is selected (Fig. 11.22).



18. Accept to load the settings.



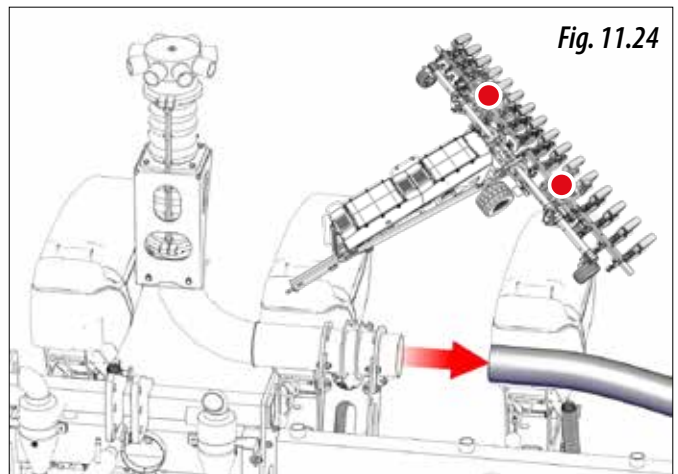
11.2 FROM ARGO SINGLE-SEED TO ARGO CEREAL

To change the machine settings, follow the steps below:

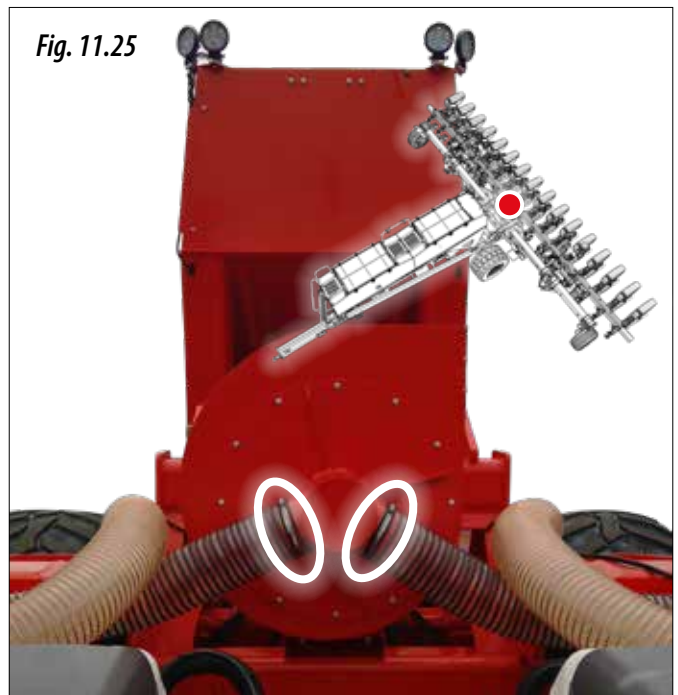


IMPORTANT: THIS TASK MUST BE PERFORMED WITH THE MACHINE IN OPERATING POSITION AND BOTH TRACK MARKERS UNFOLDED.

1. Disconnect the pipe from each single-seed unit's fertilizer distribution head.



2. Disconnect the suction turbine hoses.



3. Disconnect the distribution heads' hydraulics and the suction sensor tube.

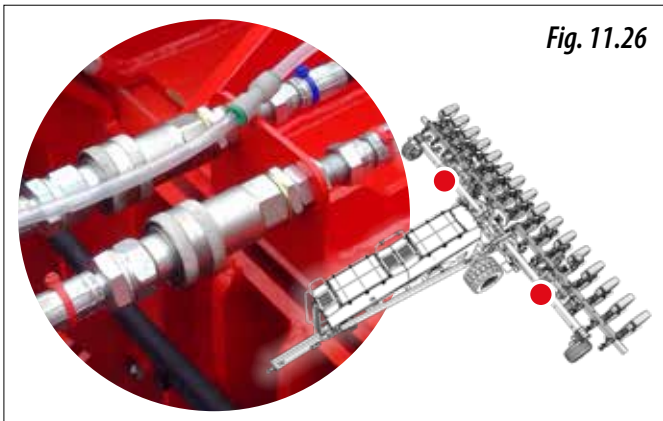


Fig. 11.26

4. Disconnect the electrical connector from each single-seed unit and place the plugs on the connectors.

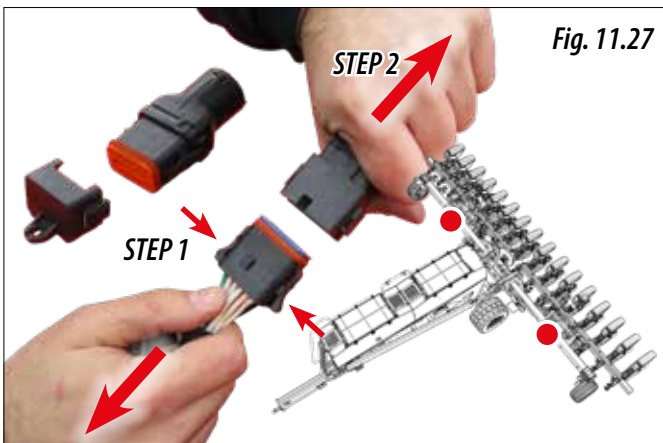


Fig. 11.27

5. If the machine has microgranulate, disconnect the microgranulate product feed pipes from the single-seed coulter units.
6. Uncouple the single-seed units at the three-point hitch.

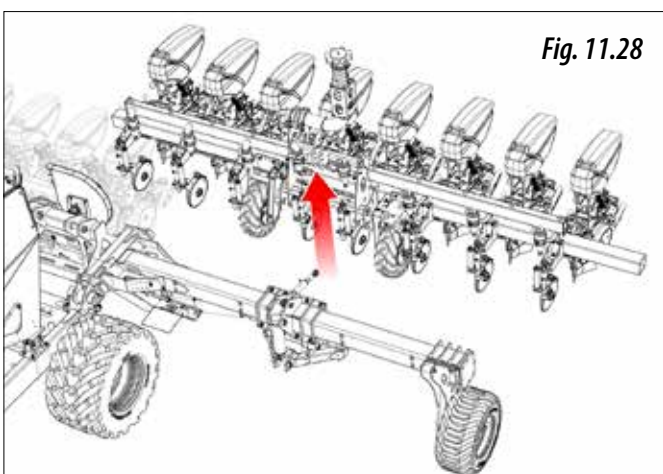


Fig. 11.28

7. Place the cylinder stop; this is located on the three-point hitches on both wings of the machine.

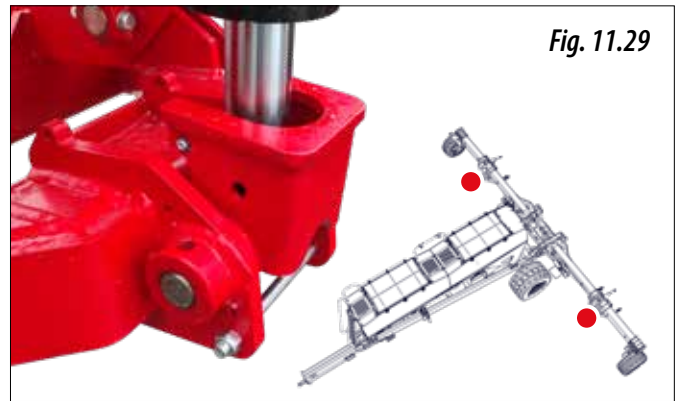


Fig. 11.29

8. Relocate the wings' tripods and/or floating wheels as shown in the figure.

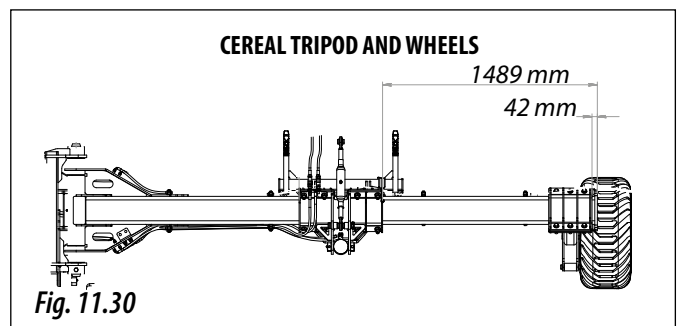
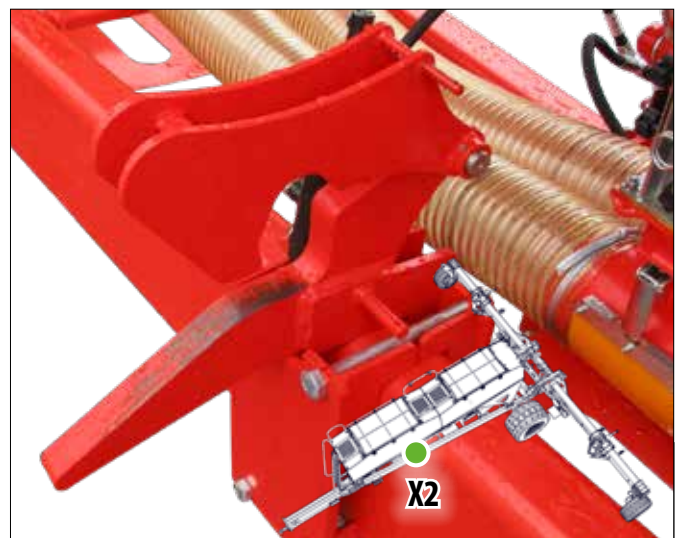


Fig. 11.30



IMPORTANT: IF THE FLOATING WHEELS ARE MOVED, THE WINGS' HYDRAULIC LOCKING LATCHES MUST BE RELOCATED; THEY ARE LOCATED ON THE MACHINE CHASSIS.



CEREAL UNIT LOCKING LATCHES

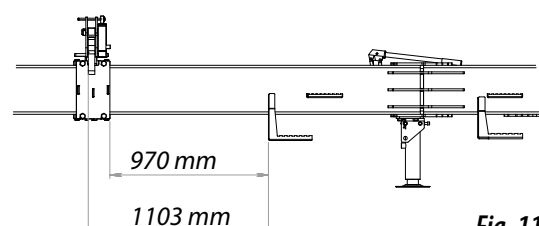


Fig. 11.31

9. Couple the cereal units at the three-point hitch.

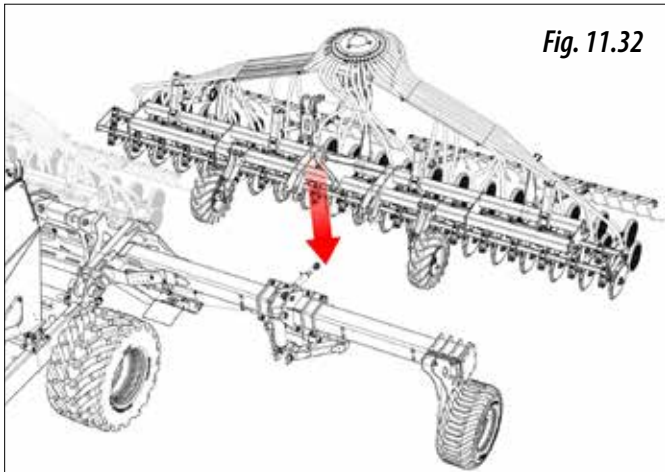


Fig. 11.32

10. Level the coulter unit using the third point's adjuster.

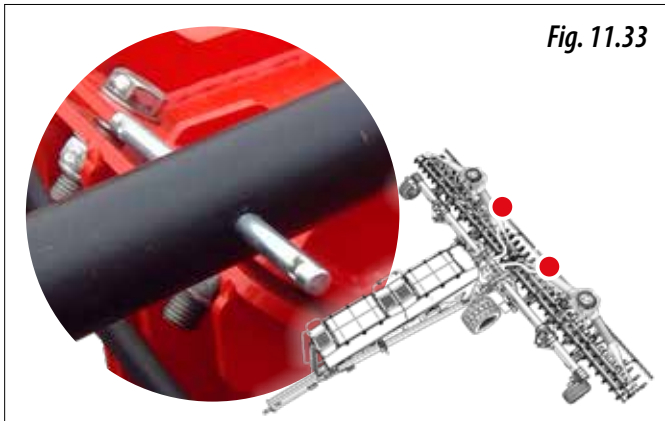


Fig. 11.33

11. Connect the distribution heads' hydraulics.

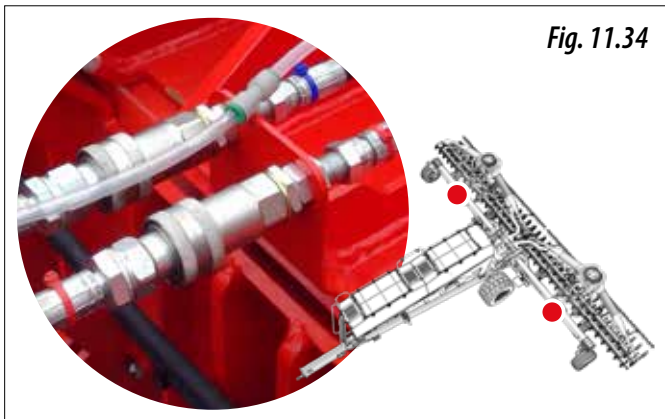


Fig. 11.34

12. Connect the product feed pipe from the large hoppers to the cereal units' distribution heads.

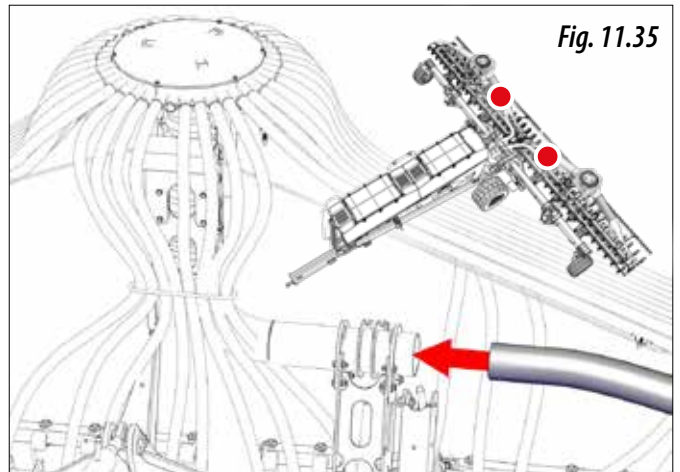


Fig. 11.35

13. Set the 2 dispensers' gate (see section 8.1 LARGE-CAPACITY HOPPERS).

14. Close the alternator's hydraulic circuit; the shut-off valve is located next to the hydraulic turbine.

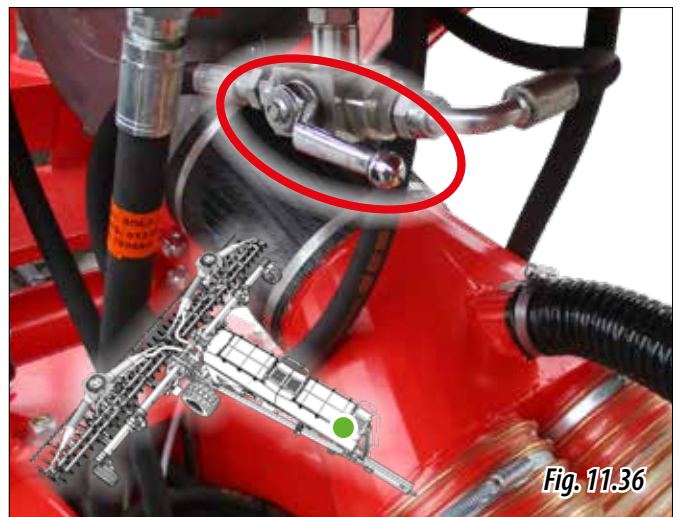


Fig. 11.36

15. Proceed as follows to configure the ISOBUS application:



Fig. 11.37

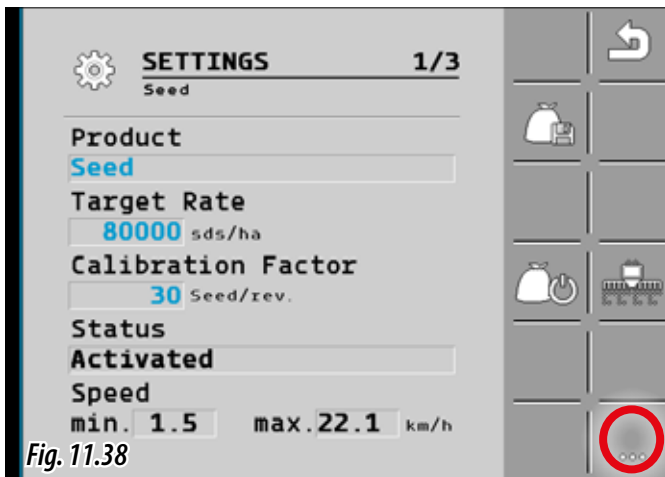


Fig. 11.38



Fig. 11.41



Fig. 11.39

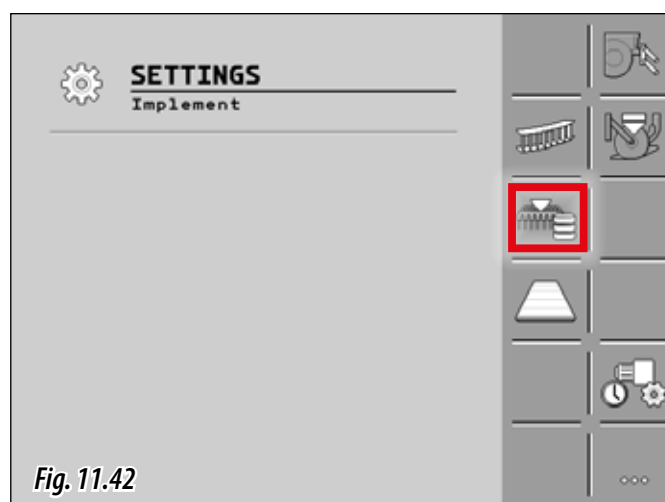


Fig. 11.42

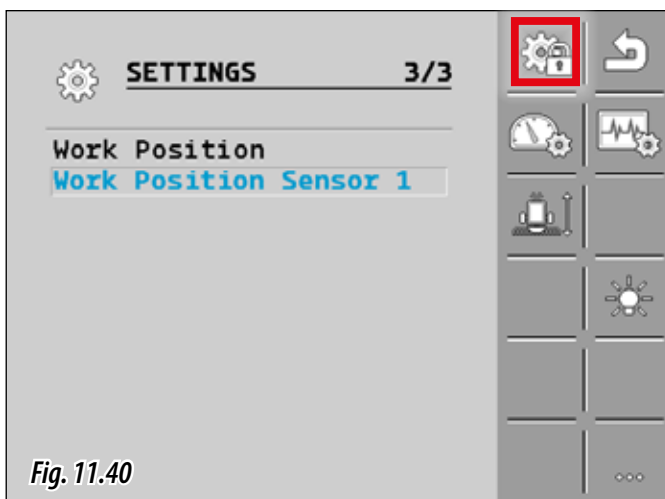


Fig. 11.40

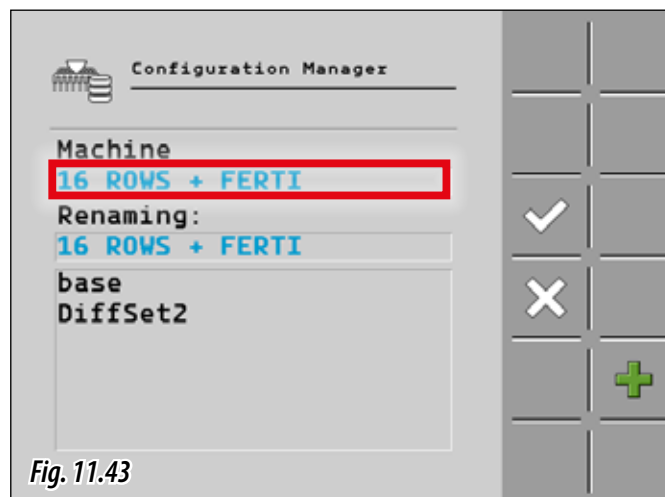


Fig. 11.43

16. The window with the machine's current settings opens; in this case, **single-seed seed drill with fertilizer** (Fig. 11.44).



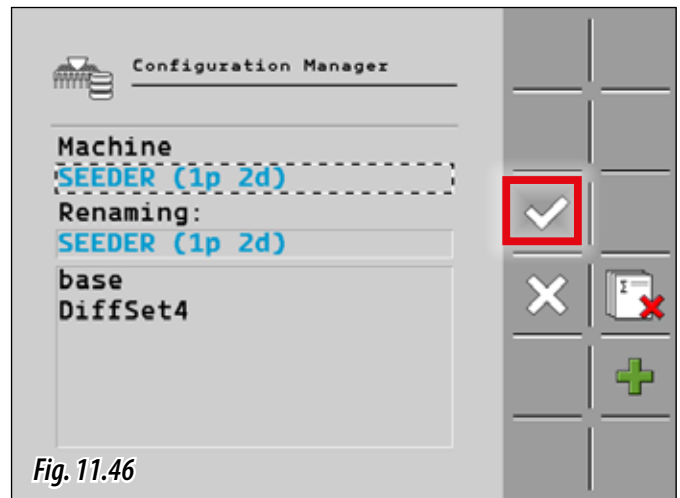
17. Select the desired settings, which can be:

- **SEEDER + FERTI (2p 2d)**: Cereal seed drill with fertilizer (2 products and 2 dispensers).
- **SEEDER (1p 2d)**: Cereal seed drill (1 product and 2 dispensers)

In this case, the setting **cereal seed drill** is selected (Fig. 11.45).



18. Accept to load the settings.





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