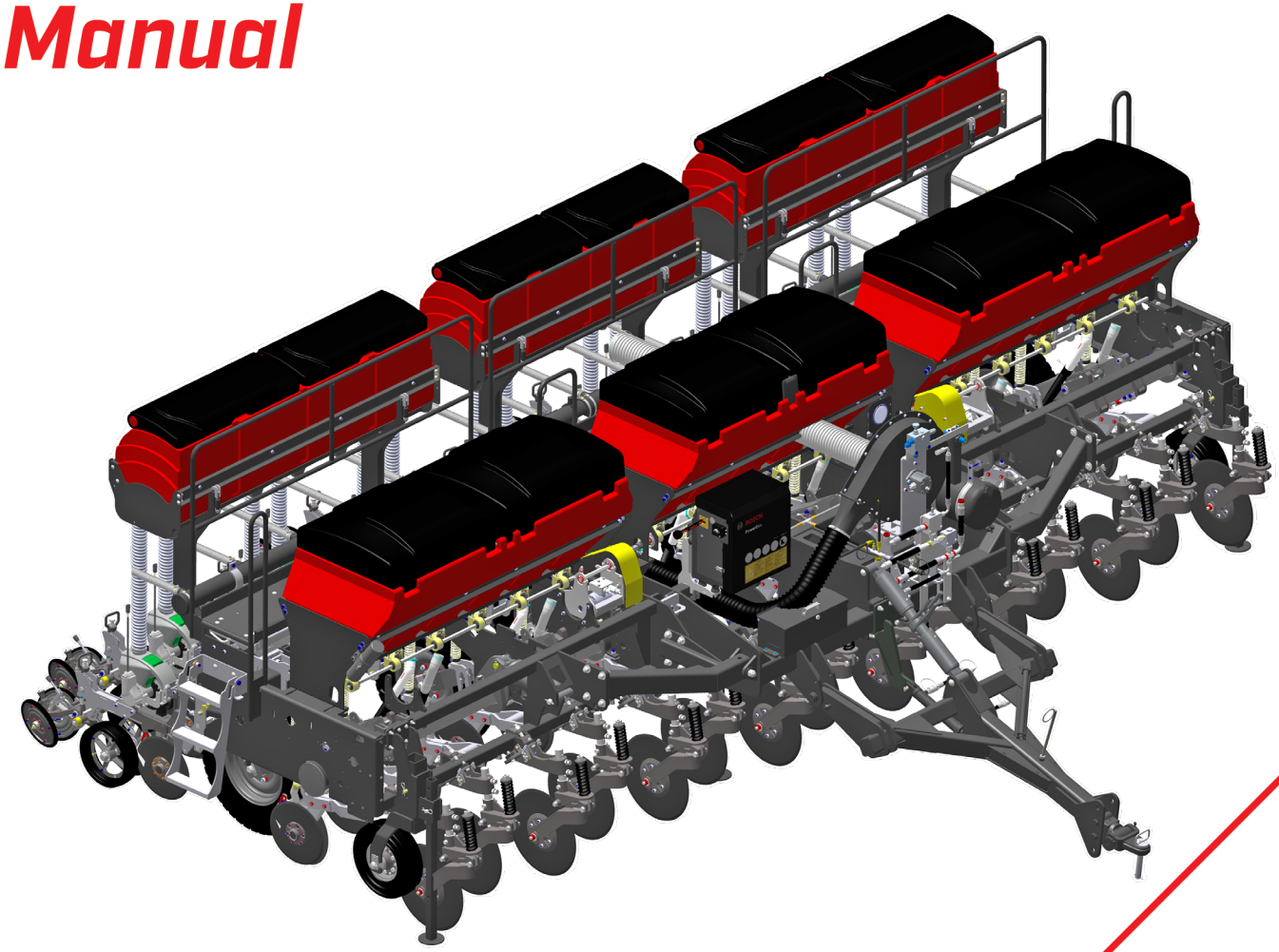
Instruction
Manual



TOPOGRAFIC AIR - BOSCH

Precision Seeder

BALDAN

▪ Presentation

We appreciate your preference and congratulate you for the excellent choice you have just made, as you have purchased a product manufactured with **BALDAN IMPLEMENTOS AGRÍCOLAS S/A** technology.

This manual will guide you through the procedures necessary; from purchase to operation, safety and maintenance procedures.

BALDAN warrants that it has delivered this implement to the complete dealer and in perfect condition.

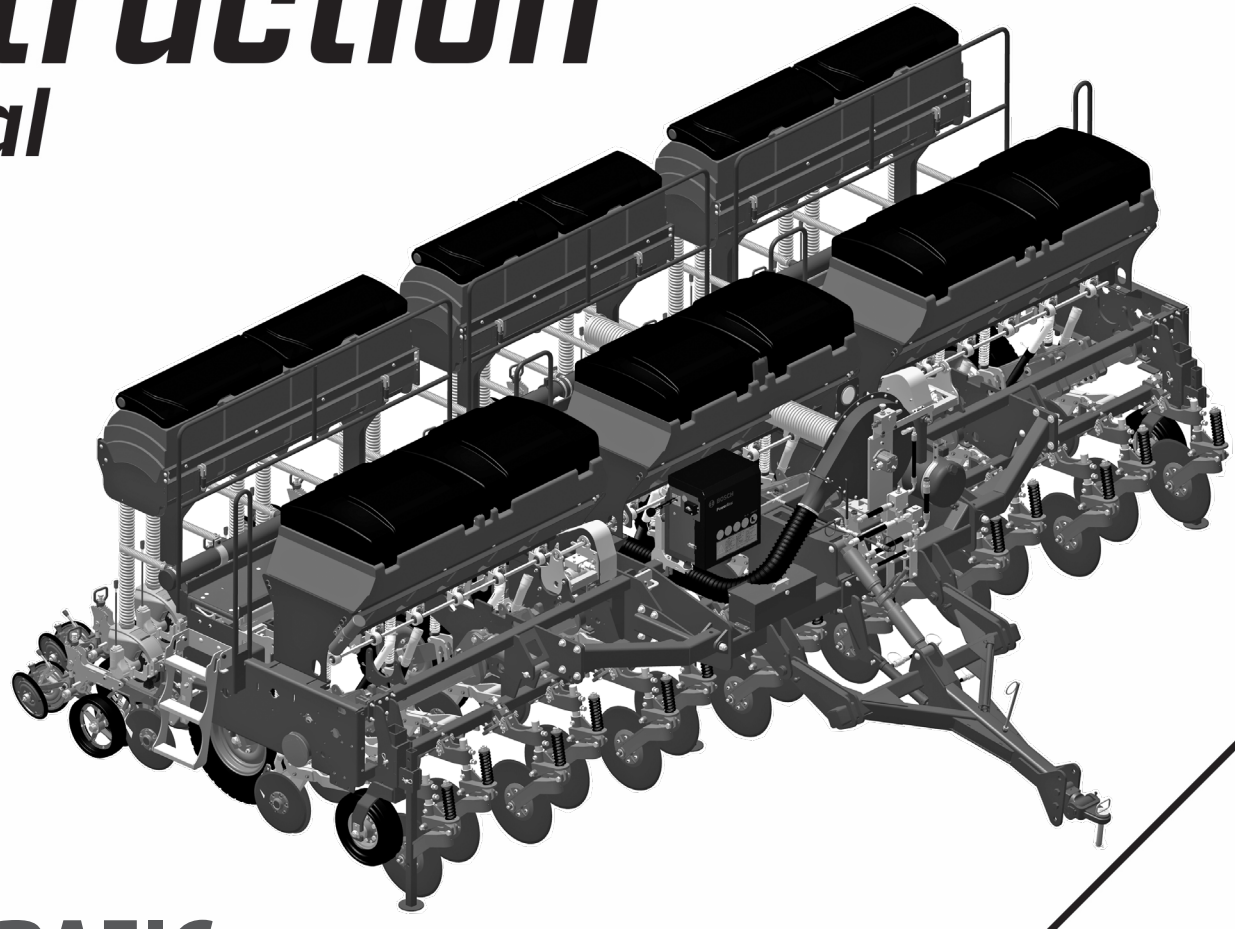
The resale is accountable for the custody and maintenance during the period it was in its power and also for assembly, retightening, lubrication and overhaul.

In technical delivery, the dealer should guide the user customer regarding maintenance, security, their obligation to possible technical assistance, the strict observance of the warranty and reading the instructions manual.

Any warranty service claim should be made to the retailer where the implement was purchased.

We reiterate the need for a careful reading of the warranty certificate and for compliance with all items in this manual, as doing so will increase the life of your implement.

Instruction
Manual



TOPOGRAFIC AIR - BOSCH

Precision Seeder

BALDAN IMPLEMENTOS AGRÍCOLAS S/A.
CNPJ: 52.311.347/0009-06
Insc. Est.: 441.016.953.110

Scan the QR Code on the identification plate of your device and access this Instruction Manual online.

BALDAN

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▪ Baldan Warranty

BALDAN IMPLEMENTOS AGRÍCOLAS S/A ensures the dealer normal performance of the implement for a period of six (6) months as of the delivery date on the retail invoice to the first final consumer.

During this period, **BALDAN** undertakes to repair defects in material and/or of manufacture of its liability, including labor, freight and other expenses of the dealer's liability.

In the warranty period, request and replacement of eventual defective parts shall be made to the dealer of the area, who will submit the faulty piece to **BALDAN** analysis.

When this procedure is not possible and the resolving capacity of the dealer is exhausted, the dealer will request the support of **BALDAN** Technical Assistance through a specific form distributed to dealers.

After analyzing the replaced items by **BALDAN** Technical Assistance, and concluding that it is not a warranty, then the dealer will be responsible for the costs related to the replacement; as well as material expenses, travel including accommodation and meals, accessories, lubricant used and other expenses arising from the call out to Technical Assistance, and **BALDAN** company is authorized to carry the respective invoice in the name of the resale.

Any repairment carried in the product within the dealer warranty deadline will only be authorized by **BALDAN** upon previous budget presentation describing parts and workforce to be executed.

The product is excluded from this term if it is repaired or modified by representatives not belonging to the **BALDAN** dealer network, as well as the application of non-genuine parts or components to the user's product.

This warranty is void where it is found that the defect or damage is caused by improper use of the product, failure to follow instructions or inexperience of the operator.

It is agreed that this warranty does not cover tires, polyethylene tanks, cardan, hydraulic components, etc., which are equipment guaranteed by their manufacturers.

Manufacturing and/or material defects, object of this warranty term, will not constitute, under any circumstances, grounds for termination of a purchase agreement, or for indemnification of any nature.

BALDAN reserves the right to change and/or perfect the technical characteristics of its products, without previous notice, and without obligation to proceed in the same way with the products previously manufactured.

▪ General Information

• To the owner

BALDAN IMPLEMENTOS AGRÍCOLAS S/A is not responsible for any damaged caused by accident due to usage, transportation, or in the improper or incorrect transportation of its implement, whether by negligence and/or inexperience of any person.

Only people with complete knowledge of the tractor and the implement should carry their transportation and operation.

BALDAN is not responsible for any damaged caused in unpredictable or unrelated situations to the normal use of the implement.

The incorrect handling of this equipment may result in severe or fatal accidents. Before running the equipment, carefully read the instructions contained in this manual. Make sure that the person responsible for the operation is instructed as the correct and safe handling. Also make sure that the operator has read and understood the instructions manual of the product.

⚠ ATTENTION

NR-31 - SAFETY AND HEALTH AT WORK IN AGRICULTURE, LIVESTOCK FARMING, FORESTRY, FOREST EXPLORATION AND AQUACULTURE.

This Regulatory Standard has the purpose of establishing precepts to be observed in the organization and work environment, compatible to the planning and development of agriculture, livestock, forestry, forest exploitation and aquaculture with safety and health and work environment.

MR. OWNER OR OPERATOR OF THE EQUIPMENT.
Read and carefully comply with provisions of NR-31.

For more information, refer to the site and read NR-31 in full.
http://portal.mte.gov.br/legislacao/normas-regulamentadoras-1.htm

▪ Safety Rules

• To the operator

THIS SYMBOL INDICATES AN IMPORTANT SAFETY WARNING. IN THIS MANUAL, WHENEVER YOU FIND IT, PLEASE READ THE FOLLOWING MESSAGE CAREFULLY AND WATCH OUT FOR POTENTIAL PERSONAL ACCIDENTS.

⚠ ATTENTION



Read the instruction manual carefully in order to get to know the recommended safety practices.

⚠ ATTENTION



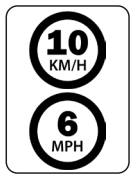
Only start operating the tractor when properly seated and with a fastened seat belt.

⚠ ATTENTION



Do not make adjustments with the seeder in operation. When doing any service on the seeder, first turn off the tractor.
Use appropriate tools.

⚠ ATTENTION



For greater safety when transporting the seeder, do not exceed a speed of 10 Km/h or 6 MPH, avoiding the risk of damage and accidents.

⚠ ATTENTION



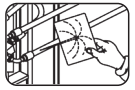
Do not work with the tractor if its front is not sufficiently weighted for the rear equipment. If it tends to lift, add weights or ballasts to the front of the machine or front wheels.

⚠ ATTENTION



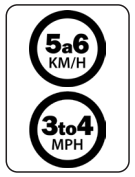
There is a risk of serious injury due to tipping when working on sloping terrains. Do not use excessive speed.

⚠ ATTENTION



When checking hoses for leaks, use a piece of cardboard or wood, never use your hands. Avoid incision of fluid in the skin.

⚠ ATTENTION



For greater efficiency and safety, work with the seeder at speeds between 5 to 6 km/h or 3 to 4 MPH, avoiding the risk of damage and accidents.

⚠ ATTENTION



Do not carry people on or inside the tractor or on the equipment.

⚠ ATTENTION



Before performing any maintenance on your equipment, make sure that it is properly stopped. Avoid getting run over.

⚠ ATTENTION



Always keep access and work places clean, such as from oil or grease, as they may cause accidents.

⚠ ATTENTION



Before working with or transporting the seeder, check for people or obstructions near the seeder.

▪ Safety Rules

⚠ ATTENTION | FOLLOW ALL RECOMMENDATIONS, WARNINGS, AND RECOMMENDED SAFETY PRACTICES IN THIS MANUAL, UNDERSTAND THE IMPORTANCE OF YOUR SAFETY. ACCIDENTS MAY CAUSE DISABILITIES OR EVEN DEATH. REMEMBER, ACCIDENTS CAN BE AVOIDED!

⚠ ATTENTION



Avoid heating parts near fluid lines.
The heating can cause the material to be brittle, ruptures, and discharges of the pressurized fluid, which can cause burns and injuries.

⚠ ATTENTION



Be careful when handling the seeder support foot, as there is a risk of accidents.

⚠ ATTENTION



Pressurized hydraulic oil under may cause serious injury if leaks occur.
Periodically check the condition of the hoses. If there is evidence of leaks, replace them immediately. Before connecting or disconnecting hydraulic hoses, relieve system pressure by activating the control with the tractor off.

⚠ ATTENTION



Keep the articulation area free while the seeder is in operation.
In sharp turns, keep the tractor wheels from touching the head.

⚠ ATTENTION



Always stay away from the active elements of the seeder (discs), they are sharp and can cause accidents.
When carrying out any work on discs, wear safety gloves on your hands.

⚠ ATTENTION



Do not operate the seeder if the transmission guards are not properly attached.
Only remove guards to proceed with gear replacement, put them back immediately.
Do not make adjustments with the seeder in motion.

⚠ ATTENTION



Improper waste disposal affects the environment and ecology as it will pollute rivers, canals, or the soil.
Find out how to properly recycle or dispose of waste.

PROTECT THE ENVIRONMENT!

⚠ ATTENTION



Do not direct water jet at the connectors and components of the IPS system when washing the seeder. Protect the connectors with plastic.

⚠ ATTENTION

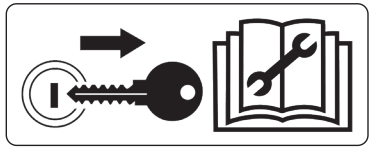


Never weld the wheel with a mounted tire, as heat can increase air pressure and cause the tire to explode.
When inflating a tire, position yourself next to the tire, never in front of it.
When inflating the tire, always use a containment device (inflation cage).

▪ Safety Rules

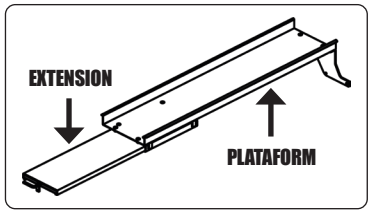
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⚠ ATTENTION



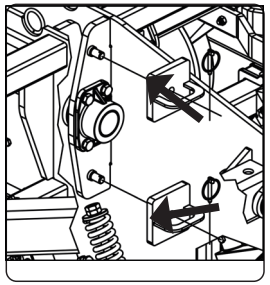
Remove the ignition key before performing any maintenance on the seeder. Protect yourself from possible injury or death, caused by an unexpected start of the seeder.
If the seeder is not properly engaged, do not start the tractor.

⚠ ATTENTION



Use the platform extender only supported on the supply trailer. Ignoring this warning could cause damage to the seeder, serious injury or death.

⚠ ATTENTION



Use the fixing plates on the uprights only when lifting the seeder. Ignoring this warning could cause damage to the seeder, serious injury or death.

SEE PAGE 41.

⚠ ATTENTION



The turbine may expel residues of toxic products used in seed treatment.

- Do not expose yourself to the air leaving the turbine when it is.

Carefully read the label of the product used to treat seeds.

- While handling, applying and planting, use Personal Protection Equipment (PPE).
- Wash your hands thoroughly after handling products.
- Treated seeds should not be exposed to people unrelated to the service, domestic animals, birds, nor allowed contact with human or animal consumption products.
- In case of intoxication due to inhalation or aspiration, keep the victim in a place with fresh air and seek a physician immediately, taking with you the chemical product label or packaging.

⚠ | POISONING SYMPTOMS: Weakness, headache, chest pressure, blurred vision, non reactive pupils, excess of salivation, perspiration, nausea, vomiting and abdominal cramps.

⚠ ATTENTION



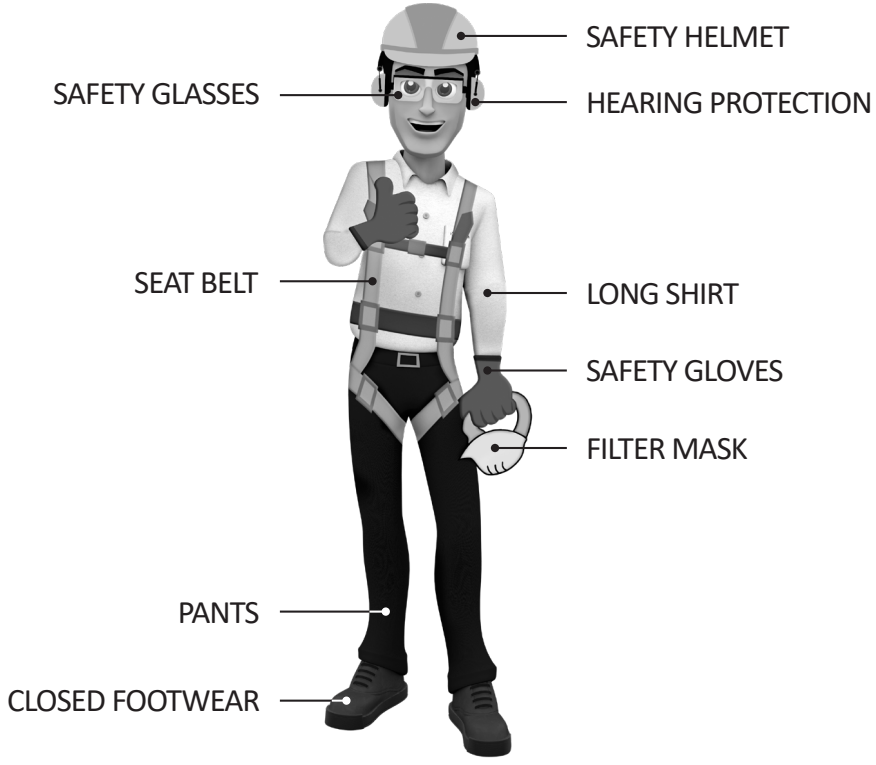
Do not drink water from the tank as it is unfit for human consumption “Non-Drinking Water”. Ignoring this warning could cause health risks.

▪ Safety Rules

• PPE Equipment

⚠ ATTENTION | **DO NOT WORK WITH THE PLANTER WITHOUT FIRST WEARING PPE (SAFETY EQUIPMENT). IGNORING THIS WARNING MAY CAUSE HEALTH DAMAGES, SERIOUS ACCIDENT, OR DEATH.**

When performing certain procedures with the seeder, place the following PPE (Safety Equipment) below:





❗ IMPORTANT

The safety practice must be carried out in all stages of work with the seeder, thus avoiding accidents such as impact of objects, falling, noise, cuts and ergonomics, that is, the person responsible for operating the seeder is subject to internal and external bodily damage.



NOTE | **All PPEs (Safety Equipment) must have an authenticity certificate.**

▪ Warnings

⚠ When operating the seeder, do not allow people to remain too close or on top of it.

⚠ When servicing the machine, wear PPE.

⚠ Do not wear loose clothing, as they may become entangled in the seeder.

⚠ When starting the tractor engine, be properly seated in the operator's seat and aware of the full knowledge of the correct and safe handling of both the tractor and the seeder. Always put the shift lever in the neutral position, disconnect the control gear from the PTO and put the hydraulic controls in the neutral position.

⚠ Do not start the tractor engine indoors without adequate ventilation as exhaust fumes are harmful to health.

⚠ When maneuvering the tractor to engage the seeder, make sure you have the necessary space and that no one is very close, always do the maneuvers at idle and be prepared to brake in an emergency.

⚠ Do not make adjustments with the seeder in operation.

⚠ When working on slopes, be careful to always maintain the required stability. In the event of imbalance, reduce acceleration, turn the wheels to the side of the slope and never raise the seeder

⚠ Always drive the tractor at safety compatible speeds, especially when working on rough or sloping terrain, always keep the tractor hitched.

⚠ When driving the tractor on roads, keep the brake pedals interconnected.

⚠ Do not work with the tractor with a light rear. If the rear tends to lift, add more weights to the rear wheels.

⚠ When leaving the tractor, shift to neutral and set the parking brake.

⚠ Any and all maintenance on the seeder must be done with the seed stopped and the tractor turned off.

⚠ All refueling or inspection must be done with the seeder stopped and the tractor turned off, using the means of safe access.

⚠ We recommend refueling the seeder only at the job site. If the seeder is to remain in the field for any reason, we recommend covering it with a waterproof tarpaulin to avoid humidity.

⚠ Do not drive on highways, especially at night. Use warning signs all along the way.

⚠ If it is necessary to travel with the seeder on highways, consult the traffic authorities.

⚠ Do not allow people who have not been trained to use the seeder, that is, who do not know how to operate it correctly.

▪ Warnings

⚠ Do not transport or work with the seeder close to obstacles, rivers or streams.

⚠ It is forbidden to transport people on self propelled machines and implements.

⚠ Changes to the original characteristics of the seeder are not authorized, as they may alter safety, operation and affect the use ful life.

⚠ Read carefully all the safety information in this manual and on the seeder.

⚠ Only operate the seeder if all guards are installed and correctly.

⚠ Do not under any circumstances remove the seeder protection components.

⚠ Always check that the seeder is in perfect condition. In the event of any irregularity that may interfere with the seeder's operation, provide proper maintenance before any work or transport.

⚠ Maintenance and especially inspection in risk areas of the seeder, must be carried out only by a trained or qualified worker, ob serving all safety guidelines. Before starting maintenance, disconnect all drive systems from the seeder.

⚠ Periodically check all components of the seeder before using it.

⚠ According to the equipment used and the working conditions in the country or in areas of maintenance, precautions are necessary. Baldan has no direct control over precautions, so it is the responsibility of the owner to put the safety procedures into practice while working with the seede r.

⚠ Check the minimum tractor power recommended for each seeder model. Only use tractors with power and ballast compatible with the load and terrain topography.

⚠ During the transport of the seeder, travel at speeds compatible with the terrain and never exceeding 10 km/h, this reduces maintenance and consequently increases the life of the seeder.

⚠ Alcoholic beverages or some medications may cause loss of reflexes and change the operator's physical condition. Therefore, never operate this seeder under the use of these substances.

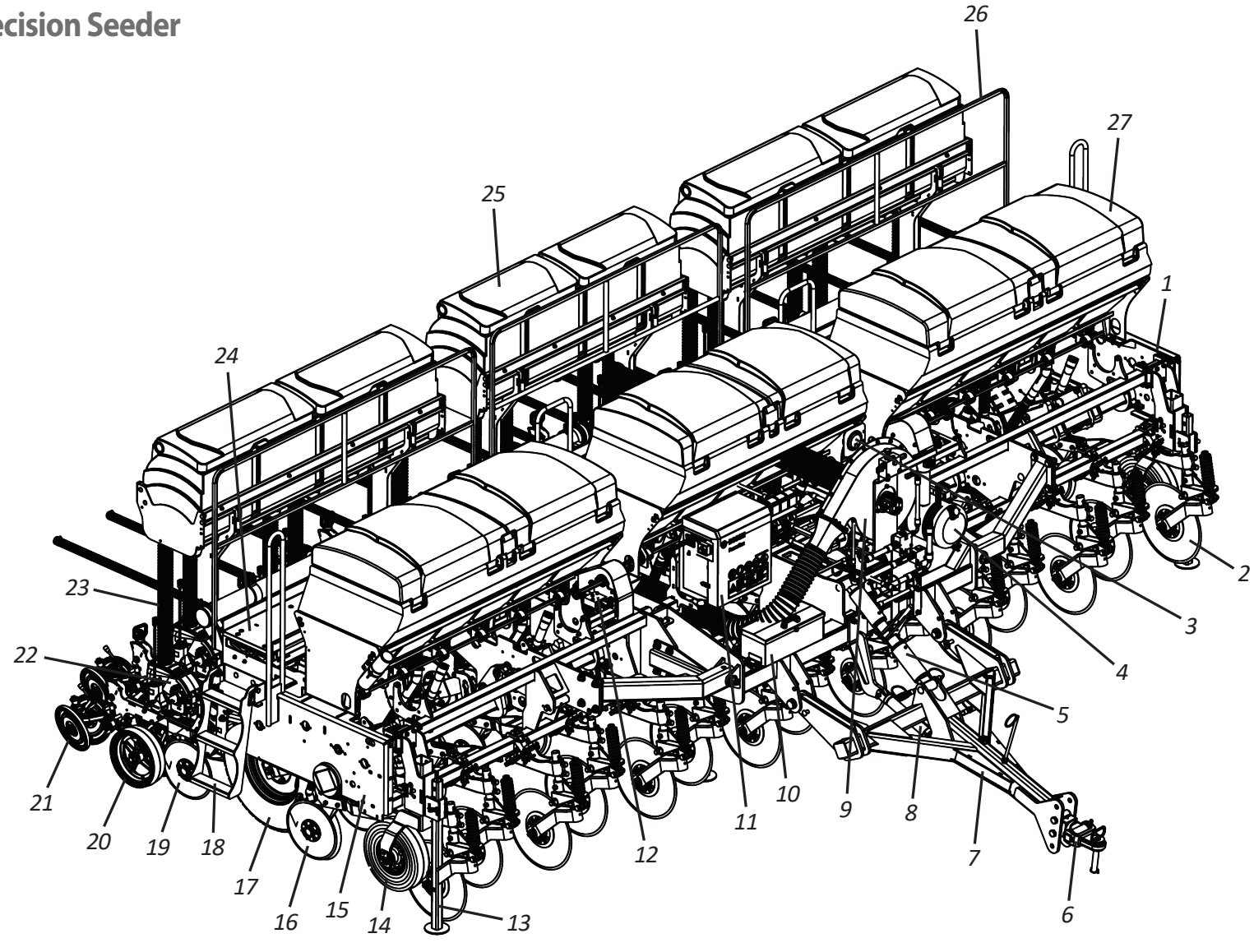
⚠ Read or explain all the procedures in this manual to the user who cannot read.

If in doubt, contact After Sales.
Telephone: 0800-152577 / E-mail: posvenda@baldan.com.br

▪ Components

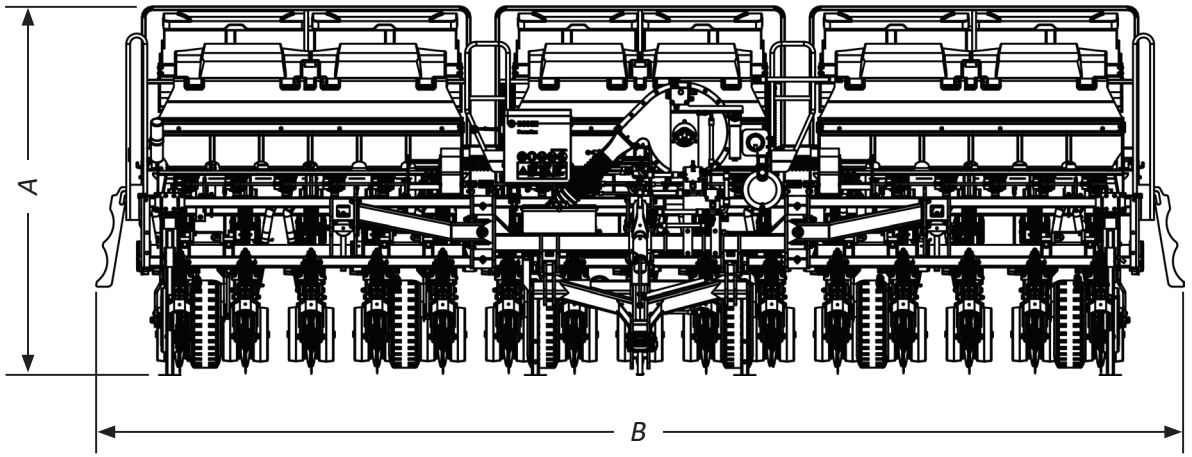
• TOPOGRAFIC AIR (BOSCH) - Precision Seeder

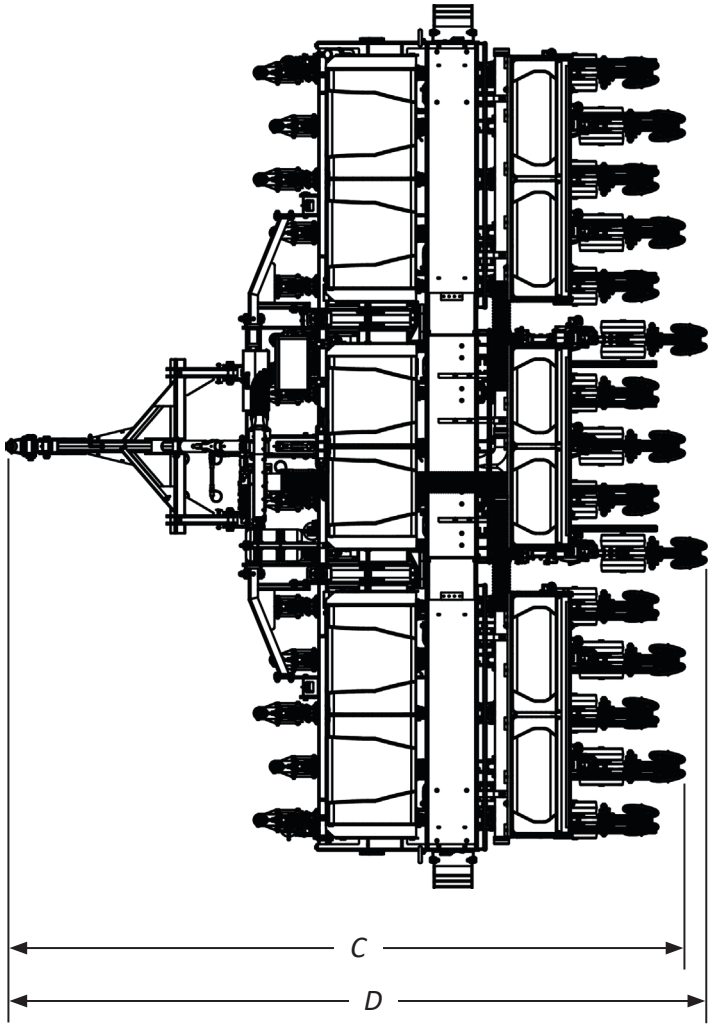
1. Chassis
2. Cutting Disc
3. Vacuum Meter
4. Non-drinking water tank
5. Regulator
6. Shackle
7. Hitch header
8. Header hydraulic cylinder
9. Turbine
10. Tool box
11. PowerBox
12. Engine with valve
13. Support bracket
14. Frame depth limiting wheel
15. Marker cylinder
16. Fertilizer double disc
17. Tire
18. Ladder
19. Double seed disc
20. Depth limiting wheel
21. "V" Wheel
22. Batcher
23. Conducting Hose
24. Platform
25. Seed tank
26. Platform handrail
27. Fertilizer tank



▪ Dimensions

• TOPOGRAFIC AIR (BOSCH) - Precision Seeder





Model	No. of Lines	Measurement A (mm)	Measurement B (mm)	Measurement C (mm)	Measurement D (mm)
6500	15	2519	7440	5715	5898

▪ Specifications

• TOPOGRAFIC AIR (BOSCH) - Precision Seeder

Model	Nr of rows	Useful width (mm)	Working width (mm)	Fertilizer deposit capacity (L)	3rd seed deposit	Spacing between lines (mm)	Working depth (mm)	Number of wheels	Approximate weight (Kg)	Approximate power (Hp)
TOPOGRAFIC AIR 6500	15	6300	6750	2120	1380	450	0 - 120	6	8875	160 - 200*

Wheelset ..... 700 x 16 x 10LS BL

(*) Approximate power (hp) depends on the normal conditions for planting and may vary according to the type of soil, topography, etc.

BALDAN reserves the right to change and or improve the technical characteristics of its products, without prior notice, and without obligation to do so with previously products manufactured. Technical specifications are approximate and reported under normal working conditions.

INTENDED USE OF TOPOGRAFIC AIR - BOSCH

TOPOGRAFIC AIR - BOSCH was developed to work with great autonomy of fertilizer and seed.
TOPOGRAFIC AIR - BOSCH must be driven and activated only by a duly instructed operator.

PROHIBITED USE OF TOPOGRAFIC AIR - BOSCH

To avoid damage, serious accident or death, DO NOT transport people on any part of **TOPOGRAFIC AIR - BOSCH.**
It is NOT permitted to use **TOPOGRAFIC AIR - BOSCH** to attach, tow or push other implements or accessories.
TOPOGRAFIC AIR - BOSCH should NOT be used by an inexperienced operator who does not know all the driving, command and operation techniques.

▪ Specifications

• Requirements for the operation of the hydraulic system - TOPOGRAFIC AIR (BOSCH)

Command	System	Flow (Minimum)
1	Lift	34 l/min*
2	Vacuum turbine and alternator	52 l/min (Turbine = 32 l/min and Alternator = 20 l/min)*
3	Fertilizer hydraulic motors	10 l/min*

(*) Minimum values that may vary for each tractor model.

▪ Assembly

TOPOGRAFIC AIR - BOSCH leaves the factory semi-assembled, lacking the assembly of some components that must be assembled according to the instructions below.

⚠ **TOPOGRAFIC AIR - BOSCH** must be assembled by resale, through trained and qualified people for this job.

⚠ Before starting the assembling the **TOPOGRAFIC AIR - BOSCH**, find an ideal place where you can easily identify parts and assemble them.

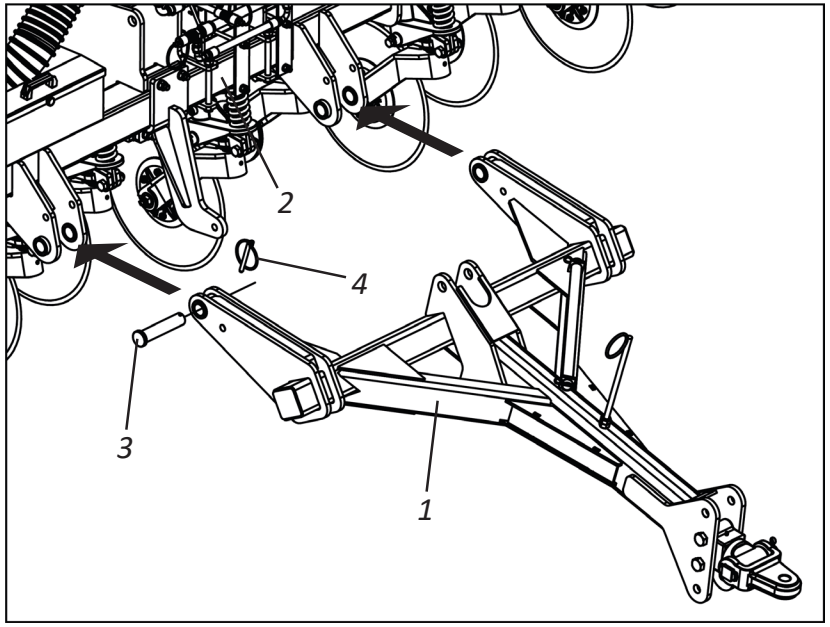
• Mounting the hitch header

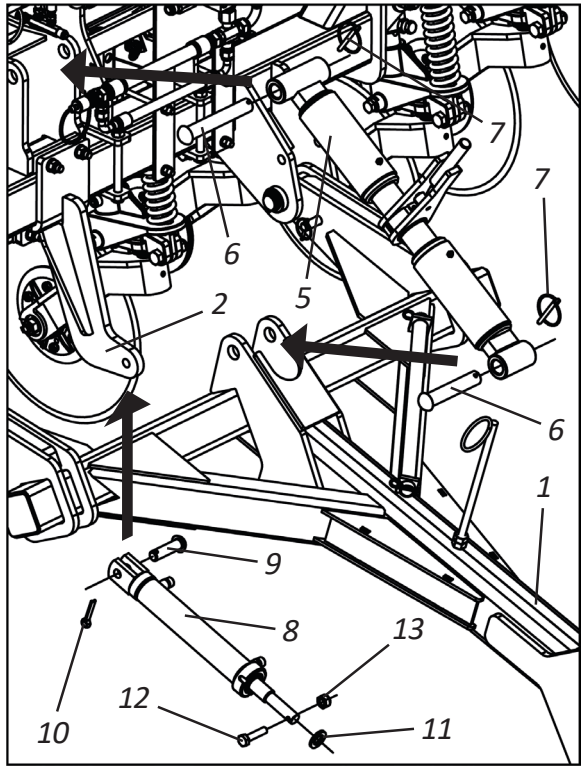
To mount the coupling header (1) on the **TOPOGRAFIC AIR - BOSCH**, proceed as follows:

01 - Attach the header (1) to the chassis (2), fixing it through the pins (3) and locks with a ring (4).

02 - Then, insert the regulator (5) in the header (1) and in the chassis (2), fixing it with the pins (6) and locks with a ring (7).

03 - Then, couple the base of the hydraulic cylinder (8) to the chassis (2), fixing with the pin (9) and lock (10) and the rod in the header (1) through the flat washer (11), screw (12) and nut (13).





⚠ ATTENTION **Connect the hoses and quick couplers to the hydraulic cylinder (8) only when articulating the header (1). Before articulating the header (1), remove the regulator (5); Ignoring this warning could cause damage, serious injury or death.**

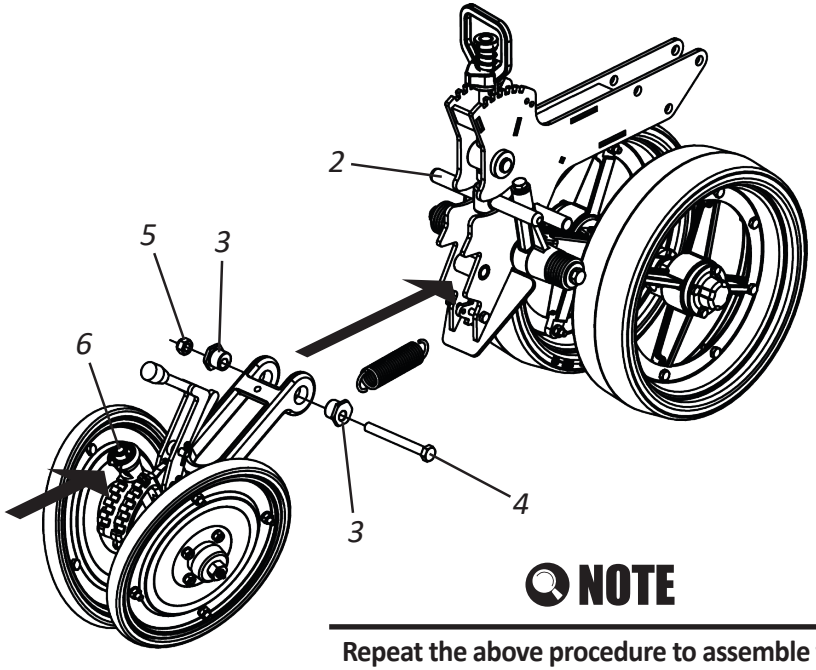
▪ Assembly

• Assembly of the compactor wheels

To mount the “V” wheel support (1), proceed as follows:

01 - Couple the “V” wheel support (1) to the depth wheel cart (2), placing the bushings (3), fixing them through the screw (4) and nut (5).

02 - Then, put the lever (6) fully forward and engage the spring (7) in the support (2).



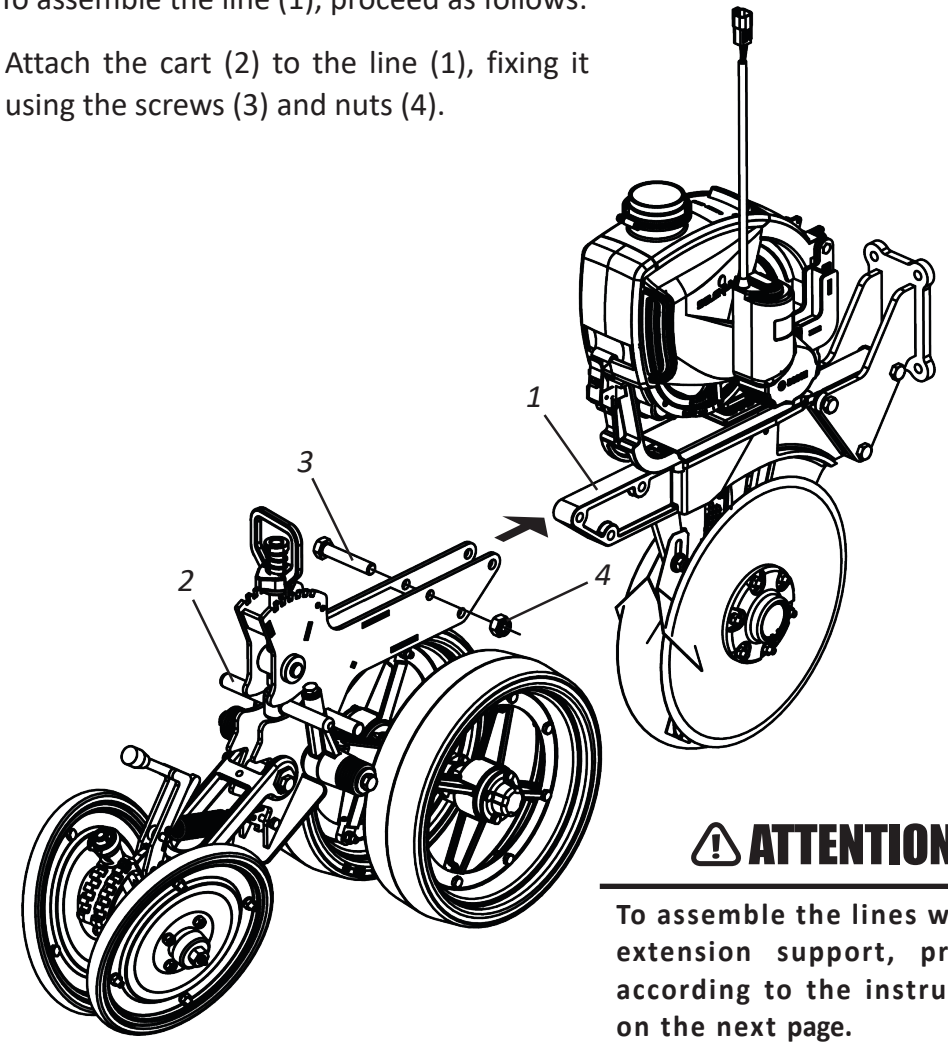
NOTE

Repeat the above procedure to assemble the other compactor wheels.

• Assembly of the lines

To assemble the line (1), proceed as follows:

01 - Attach the cart (2) to the line (1), fixing it using the screws (3) and nuts (4).



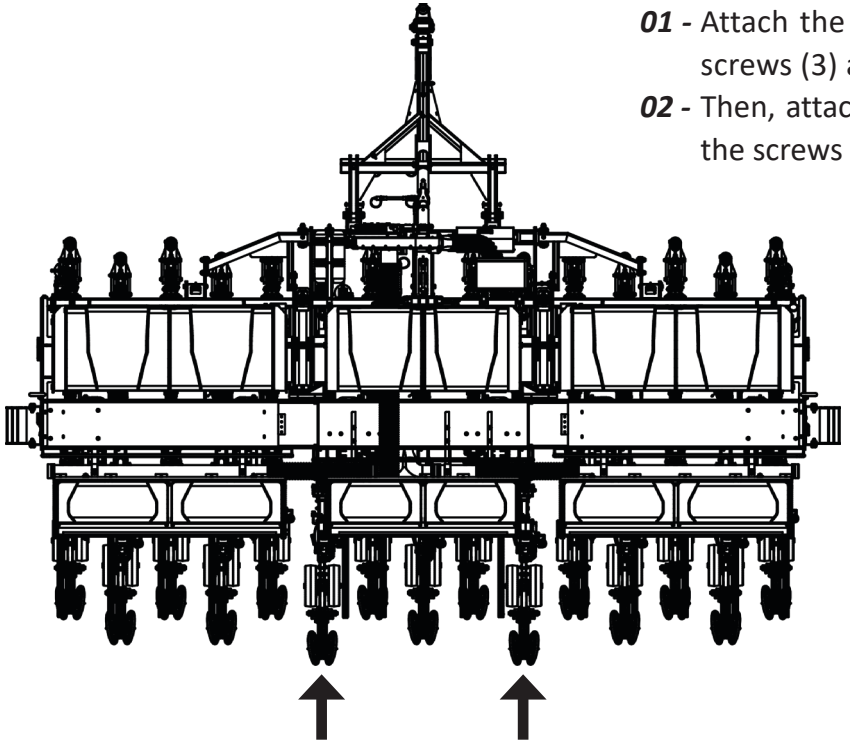
ATTENTION

To assemble the lines with an extension support, proceed according to the instructions on the next page.

▪ Assembly

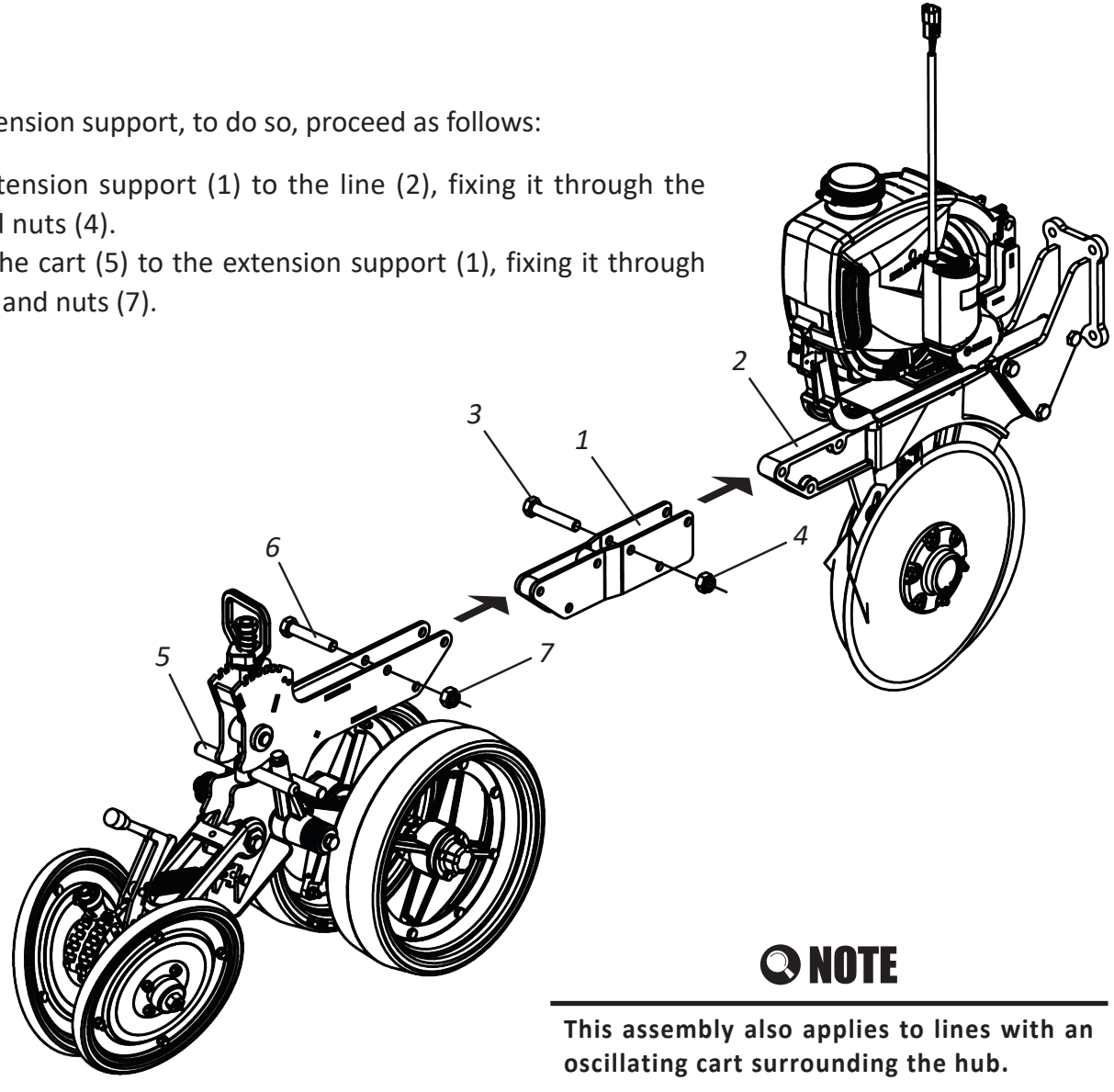
• Assembly of lines with extender support

At the ends of the central upright, mount the lines with an extension support, to do so, proceed as follows:



01 - Attach the extension support (1) to the line (2), fixing it through the screws (3) and nuts (4).

02 - Then, attach the cart (5) to the extension support (1), fixing it through the screws (6) and nuts (7).



⚠ ATTENTION

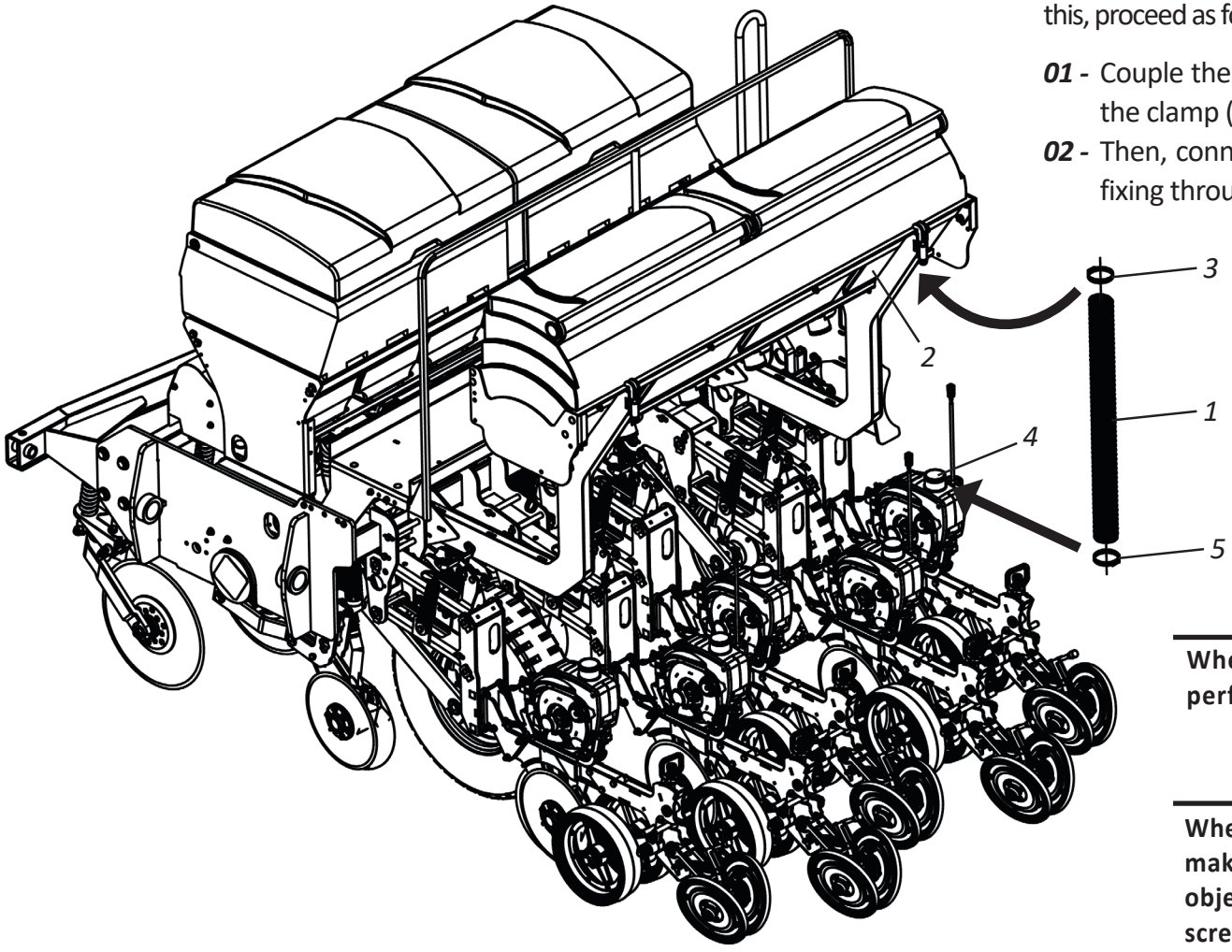
Be sure to mount the extension support on the lines at the ends of the central upstream. Ignoring this warning could result in damage to these lines.

NOTE

This assembly also applies to lines with an oscillating cart surrounding the hub.

▪ Assembly

• Mounting the conductive seed hoses



When finishing the assembly of the lines, fix the conductive seed hoses (1), for this, proceed as follows:

01 - Couple the conductive seed hose (1) in the upper seed tank (2), through the clamp (3).

02 - Then, connect the conductive seed hose (1) to the lower seed tank (4), fixing through the clamp (5).

NOTE

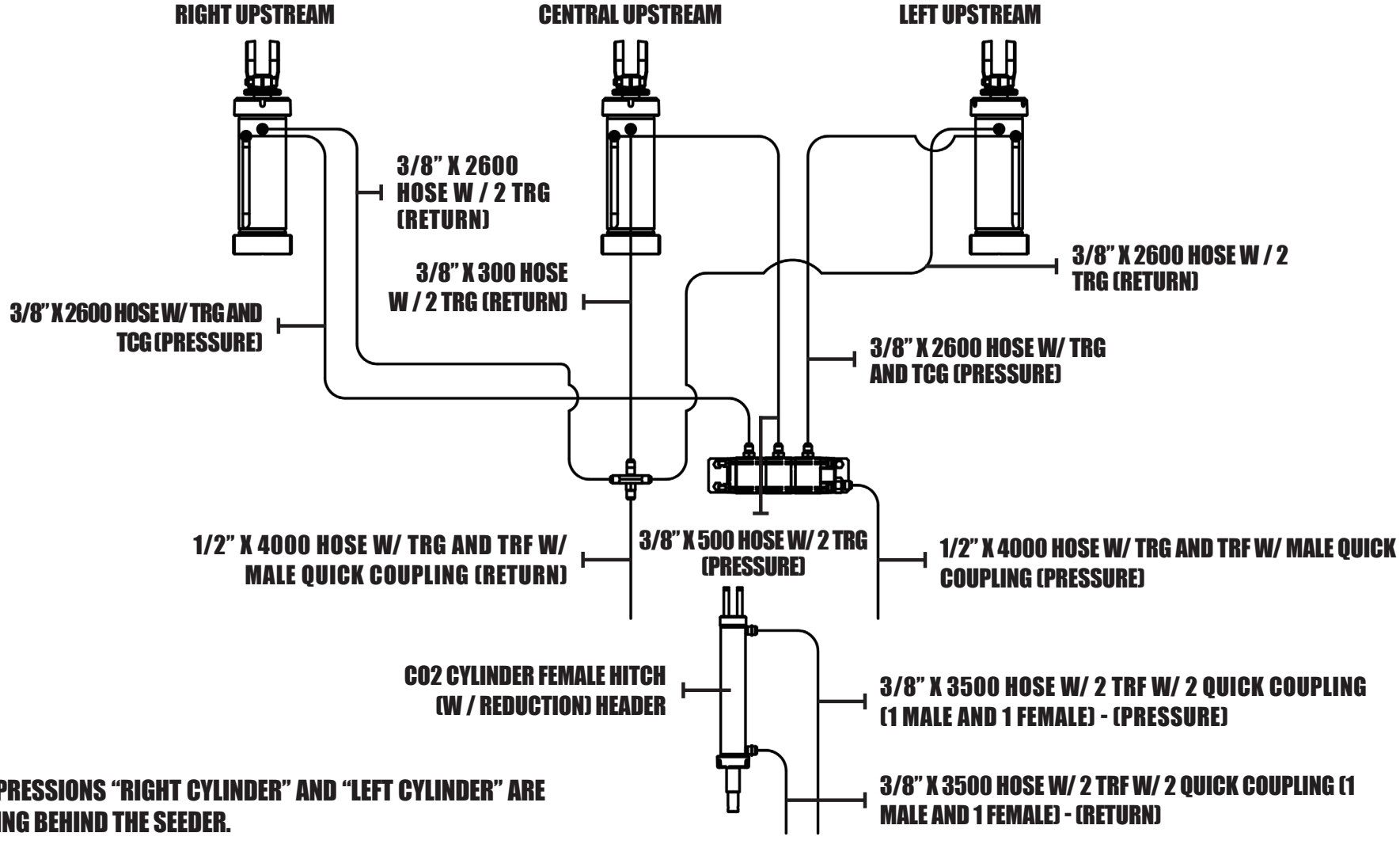
When finishing the assembly of the conductive seed hoses (1), perform the same procedure on the other lines.

⚠ ATTENTION

When finishing the assembly of the conductive seed hoses (1), make a general overhaul on the seeder, check that there are no objects (nuts, screws or others) inside the tanks. Retighten all screws and nuts, check all pins, cotter pins, locks and hoses.

▪ Assembly

- Assembly of the hydraulic system without line marker

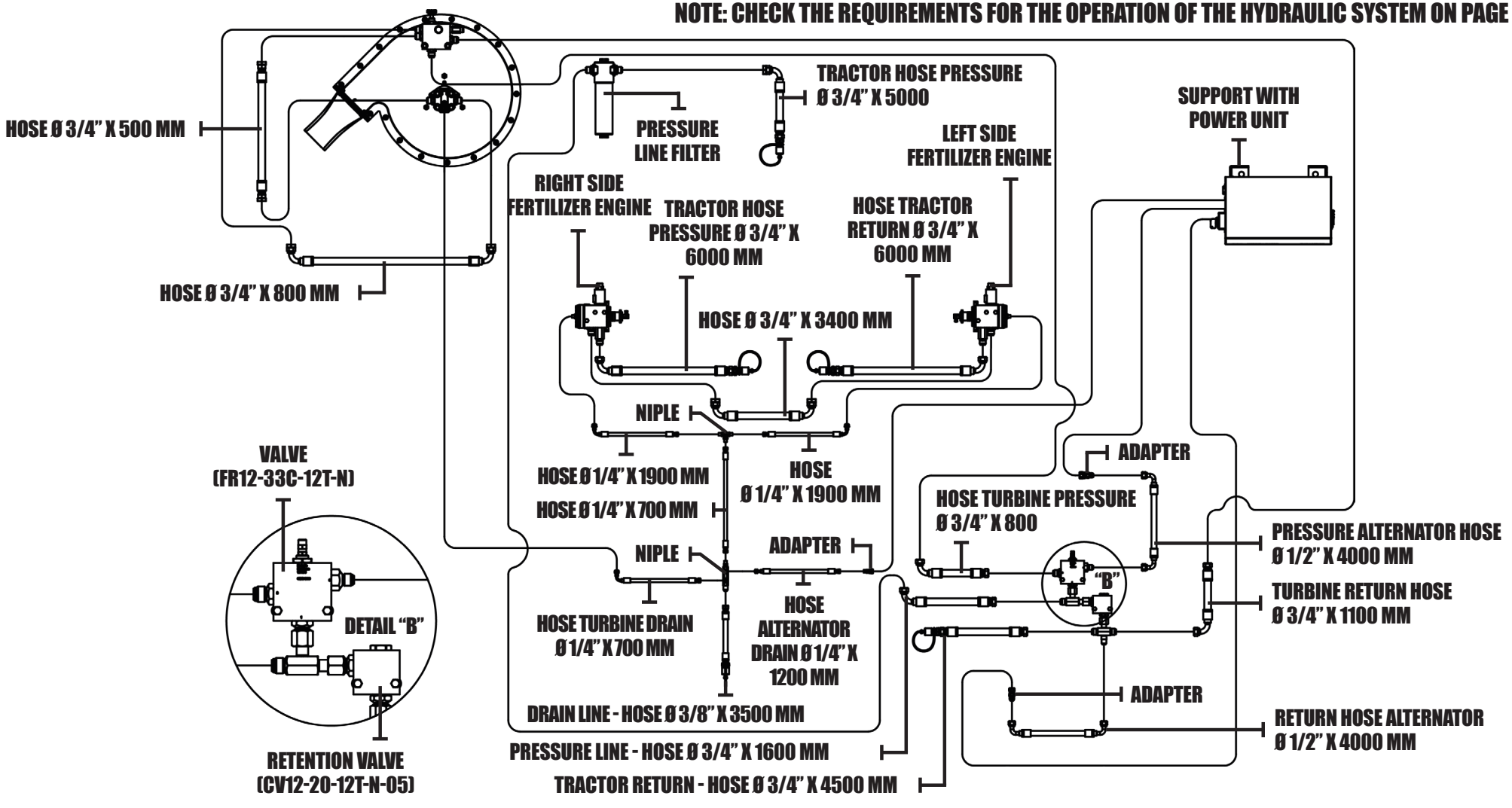


NOTE: THE EXPRESSIONS "RIGHT CYLINDER" AND "LEFT CYLINDER" ARE NAMED LOOKING BEHIND THE SEEDER.

▪ Assembly

• Hydraulic system assembly - Negative pressure turbine / Hydraulic motor in the fertilizer / Alternator

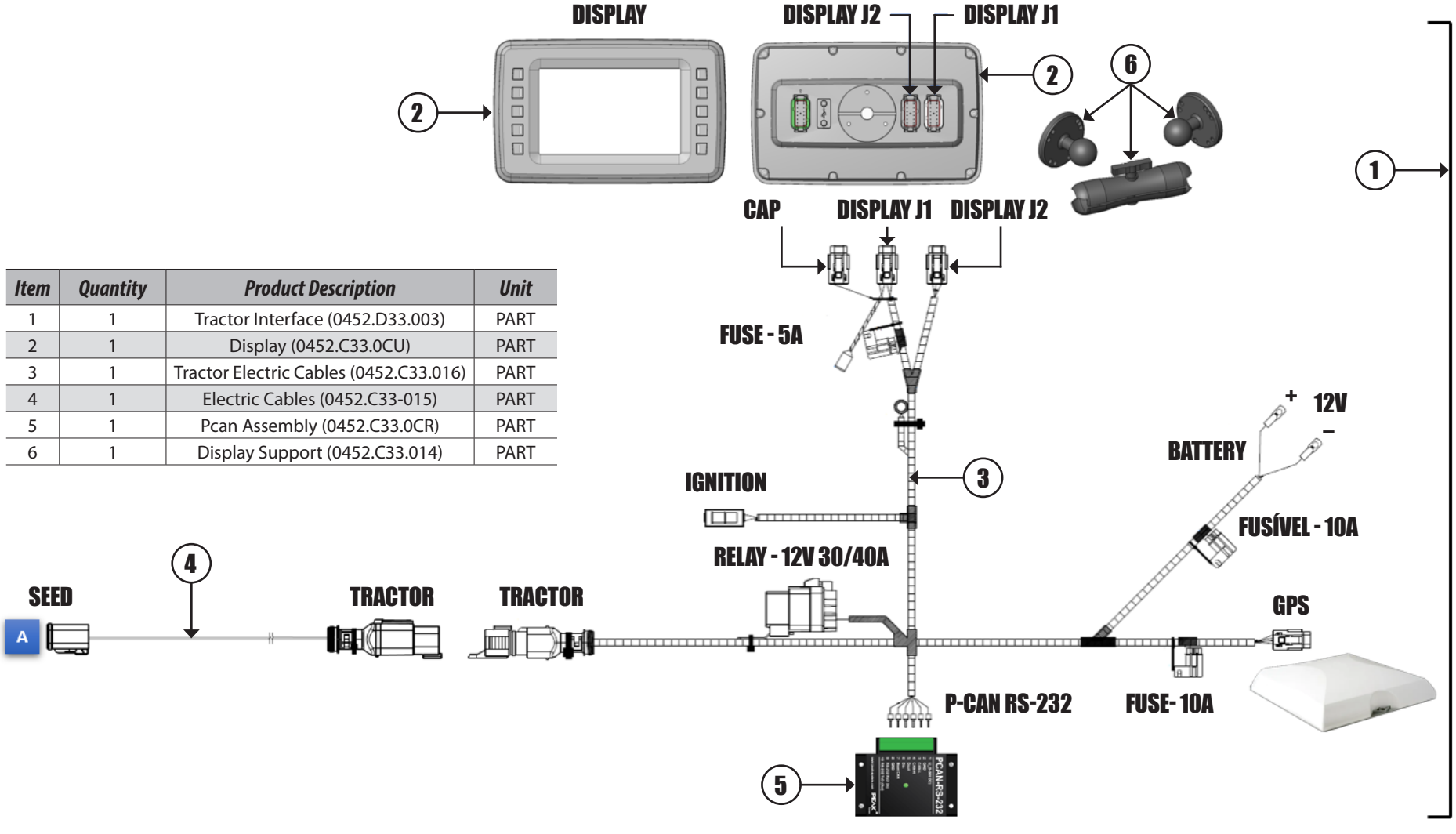
NOTE: CHECK THE REQUIREMENTS FOR THE OPERATION OF THE HYDRAULIC SYSTEM ON PAGE 23.



Assembly

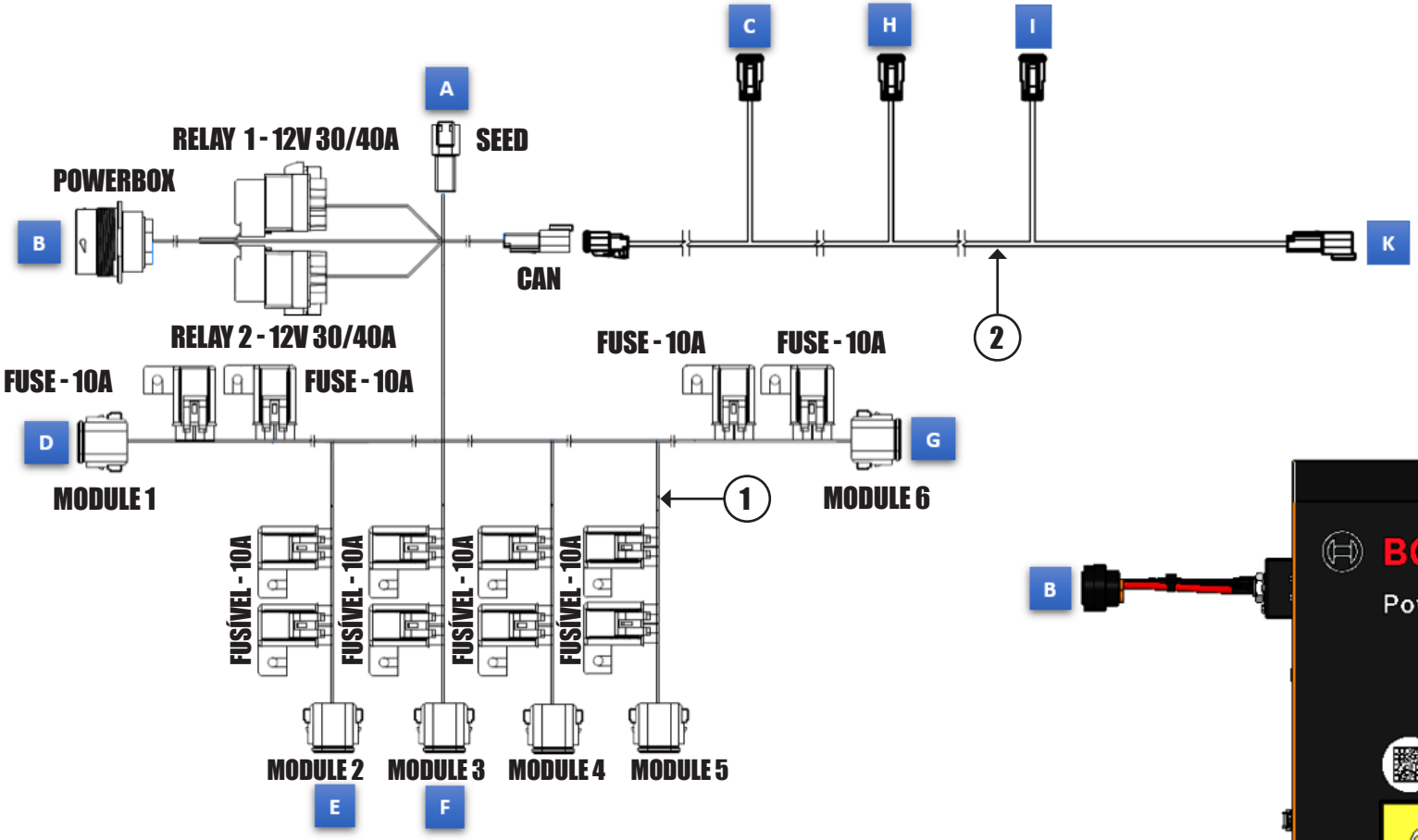
• Mounting the electrical system on the tractor

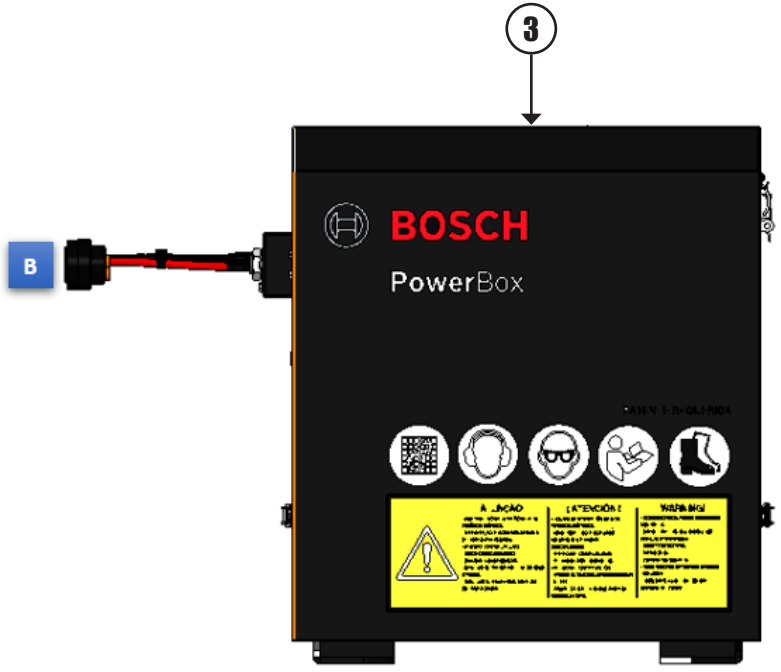
Item	Quantity	Product Description	Unit
1	1	Tractor Interface (0452.D33.003)	PART
2	1	Display (0452.C33.0CU)	PART
3	1	Tractor Electric Cables (0452.C33.016)	PART
4	1	Electric Cables (0452.C33-015)	PART
5	1	Pcan Assembly (0452.C33.0CR)	PART
6	1	Display Support (0452.C33.014)	PART



▪ Assembly

• Installation of the electrical system on the seeder

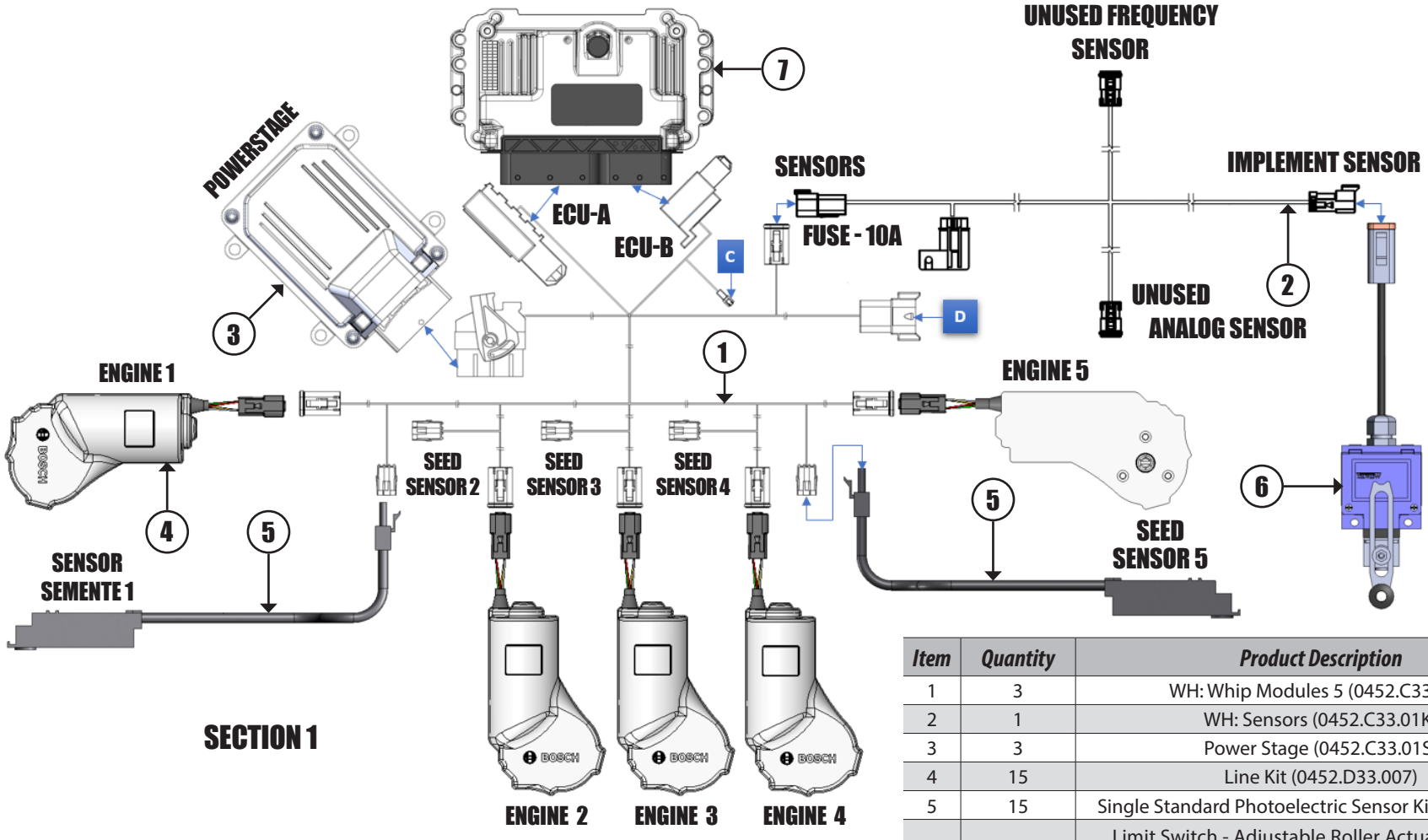




Item	Quantity	Product Description	Unit
1	1	Distributor 30 (0452.C33.07Z)	PART
2	1	Main Channel (0452.C33.081)	PART
3	1	Power Distribution Power Unit (0452.D33.004)	PART

Assembly

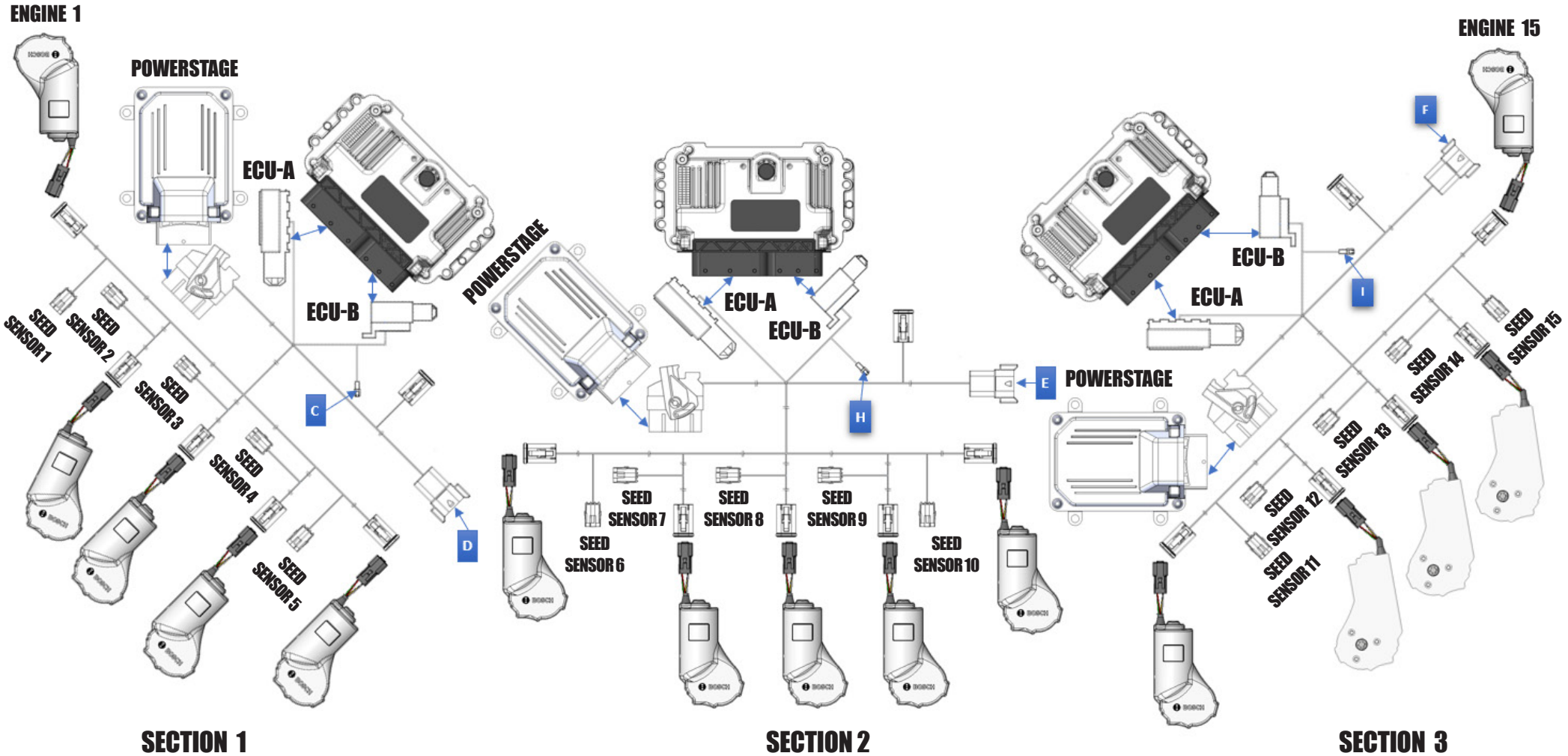
• Assembly of the electrical system on the lines - Part I



Item	Quantity	Product Description	Unit
1	3	WH: Whip Modules 5 (0452.C33.087)	PART
2	1	WH: Sensors (0452.C33.01K)	PART
3	3	Power Stage (0452.C33.01S)	PART
4	15	Line Kit (0452.D33.007)	PART
5	15	Single Standard Photoelectric Sensor Kit (030010010)	PART
6	1	Limit Switch - Adjustable Roller Actuator (TZE41) DEUTSCH Connector DT06-3S Complete	PART
7	3	MPECU (0452.C33.01R)	PART

▪ Assembly

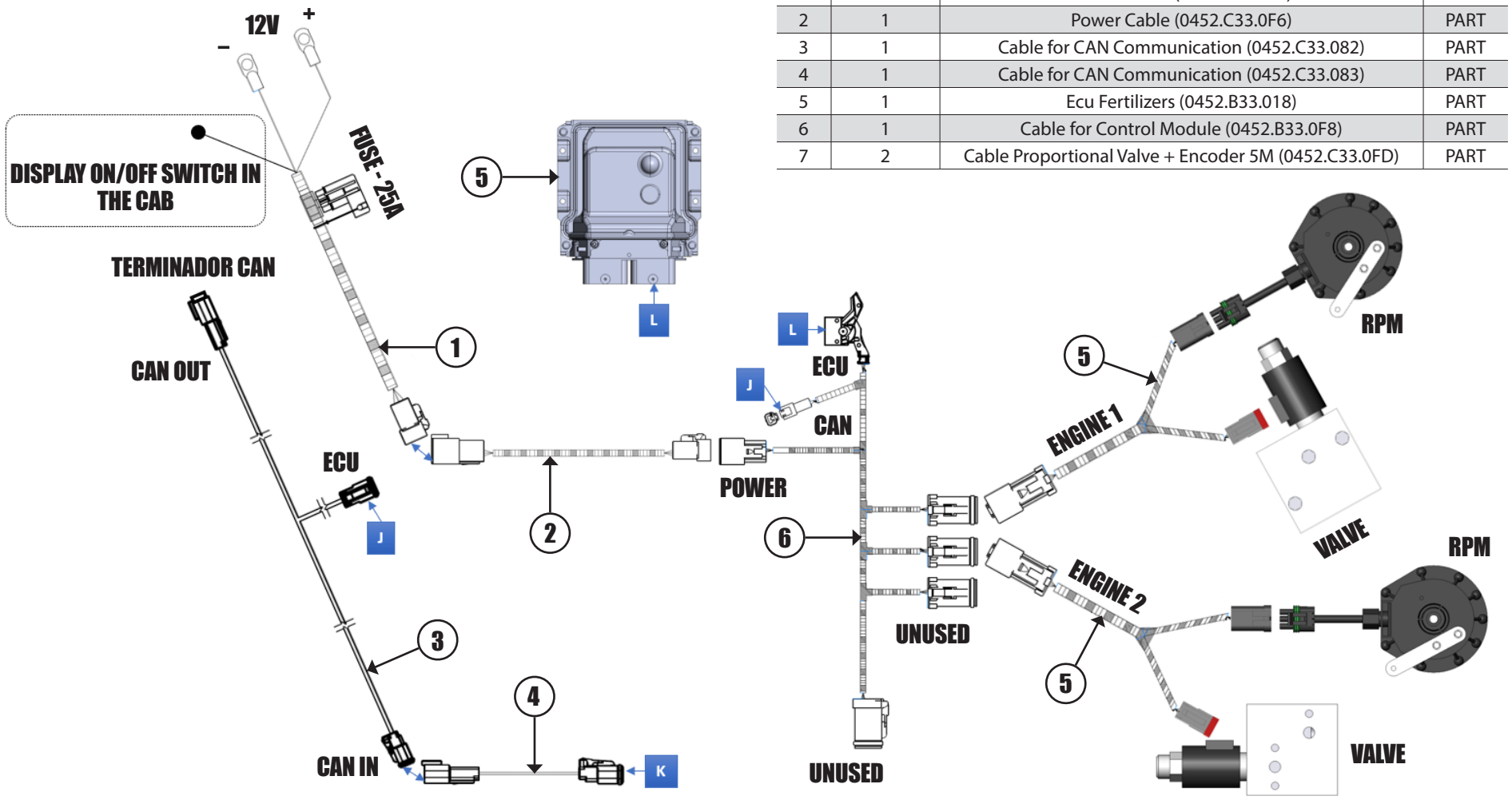
• Assembly of the electrical system on the lines - Part II



Assembly

• Assembly of the electrical system between Fertilizer and Seed

Item	Quantity	Product Description	Unit
1	1	Power Cable (0452.C33.0F5)	PART
2	1	Power Cable (0452.C33.0F6)	PART
3	1	Cable for CAN Communication (0452.C33.082)	PART
4	1	Cable for CAN Communication (0452.C33.083)	PART
5	1	Ecu Fertilizers (0452.B33.018)	PART
6	1	Cable for Control Module (0452.B33.0F8)	PART
7	2	Cable Proportional Valve + Encoder 5M (0452.C33.0FD)	PART



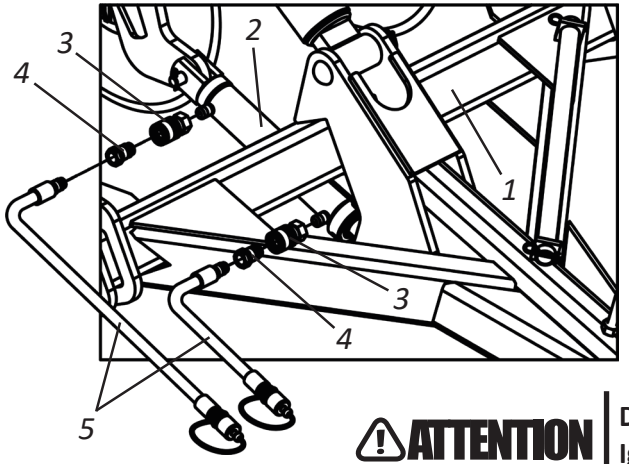
▪ Hitch

• Hydraulic system for lifting and lowering the header

TOPOGRAFIC AIR - BOSCH has a hydraulic system to raise and lower the header (1) through the activation of the hydraulic cylinder (2). Before transporting the seeder on the truck, lift the header (1), to do so, proceed as follows:

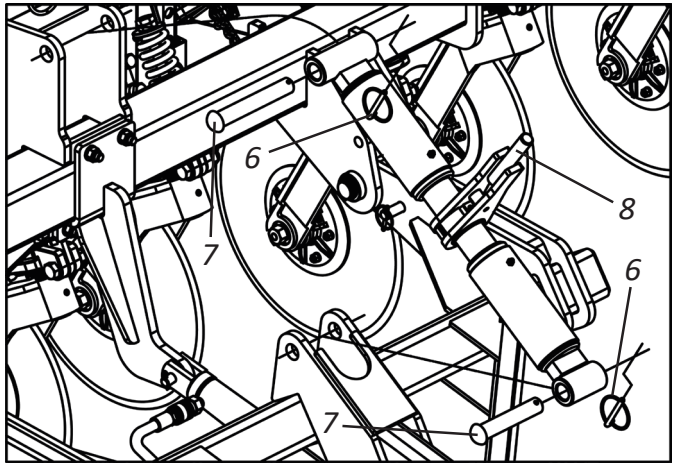
01 - Attach the female quick couplers (3) to the hydraulic cylinder (2) and the male quick couplers (4) to the hoses (5).

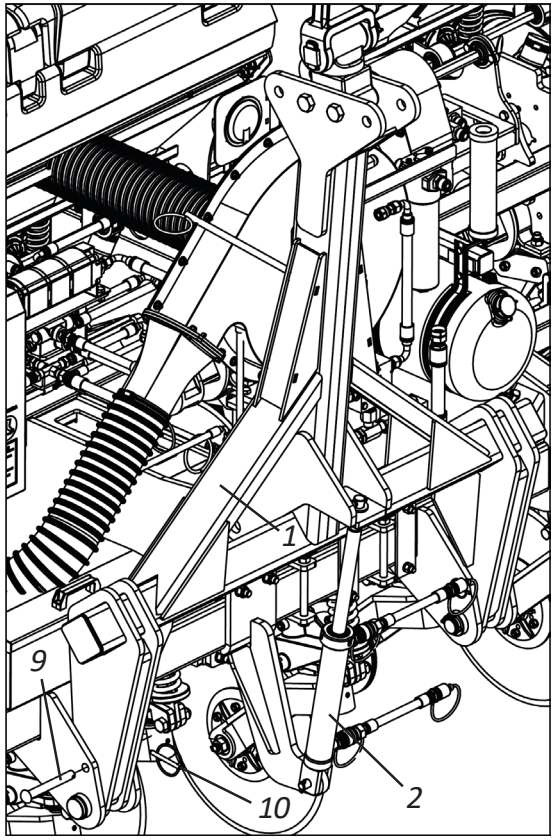
02 - Then, couple the male quick couplers (4) to the female quick couplers (3) and the other end of the hoses (5) to the tractor.



03 - Then, release the locks (6), pins (7) and remove the regulator (8).

04 - Then, activate the hydraulic cylinder (2) to lift the header (1) and lock it through the pins (9) and locks (10).





⚠ATTENTION **Do not activate the hydraulic cylinder (2) before removing the regulator (8). Ignoring this warning can cause damage, serious accident or death.**

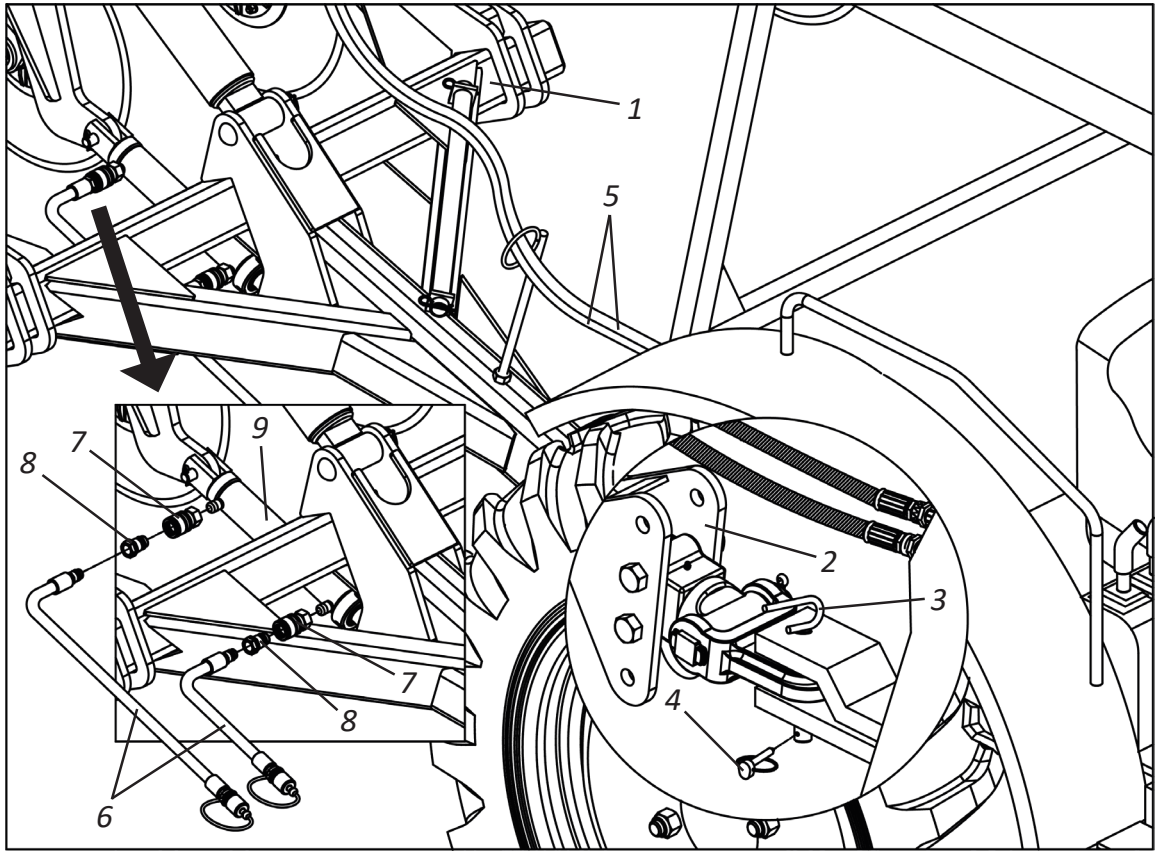
❗ IMPORTANT **To lower the header (1), do the reverse process, ending with the removal of the hoses (5) and female (3) and male (4) quick couplings from the cylinder (2) of the header (1). Do not work or transport the seeder with the hoses (5) attached to the cylinder (2). Ignoring this warning can cause damage, serious accident or death.**

▪ Hitch

• Tractor hitch

Before coupling the **TOPOGRAFIC AIR - BOSCH** to the tractor, check that the tractor is equipped with a set of weights or ballasts on the front or front wheels so as not to lift the tractor. The rear wheels will give the tractor greater stability and traction on the ground.

To couple the **TOPOGRAFIC AIR - BOSCH**, proceed as follows:



01 - Level the coupling head (1) of the seeder in relation to the tractor coupling through the adjustments (2) of the coupling shackle. Then, slowly approach the seeder to the tractor in reverse, paying attention to the application of the brakes.

02 - Proceed the coupling of the seeder to the tractor, fixing it through the coupling pin (3) and lock (4).

03 - Finish by coupling the hoses (5) to the tractor's quick coupling.

⚠ ATTENTION

When completing the coupling of the seeder to the tractor, remove the hoses (6) and the male (7) and female (8) quick couplers from the hydraulic cylinder (9) of the header (1). Do not work or transport the seeder with the hoses (6) engaged in the hydraulic cylinder (9) of the header (1). Ignoring this warning can cause damage or serious injury or even death.

❗ IMPORTANT

Before connecting or disconnecting the hydraulic hoses, turn off the engine and relieve the pressure in the hydraulic system by operating the control levers fully. When relieving system pressure, make sure no one is near the equipment moving area.

🔍 NOTE

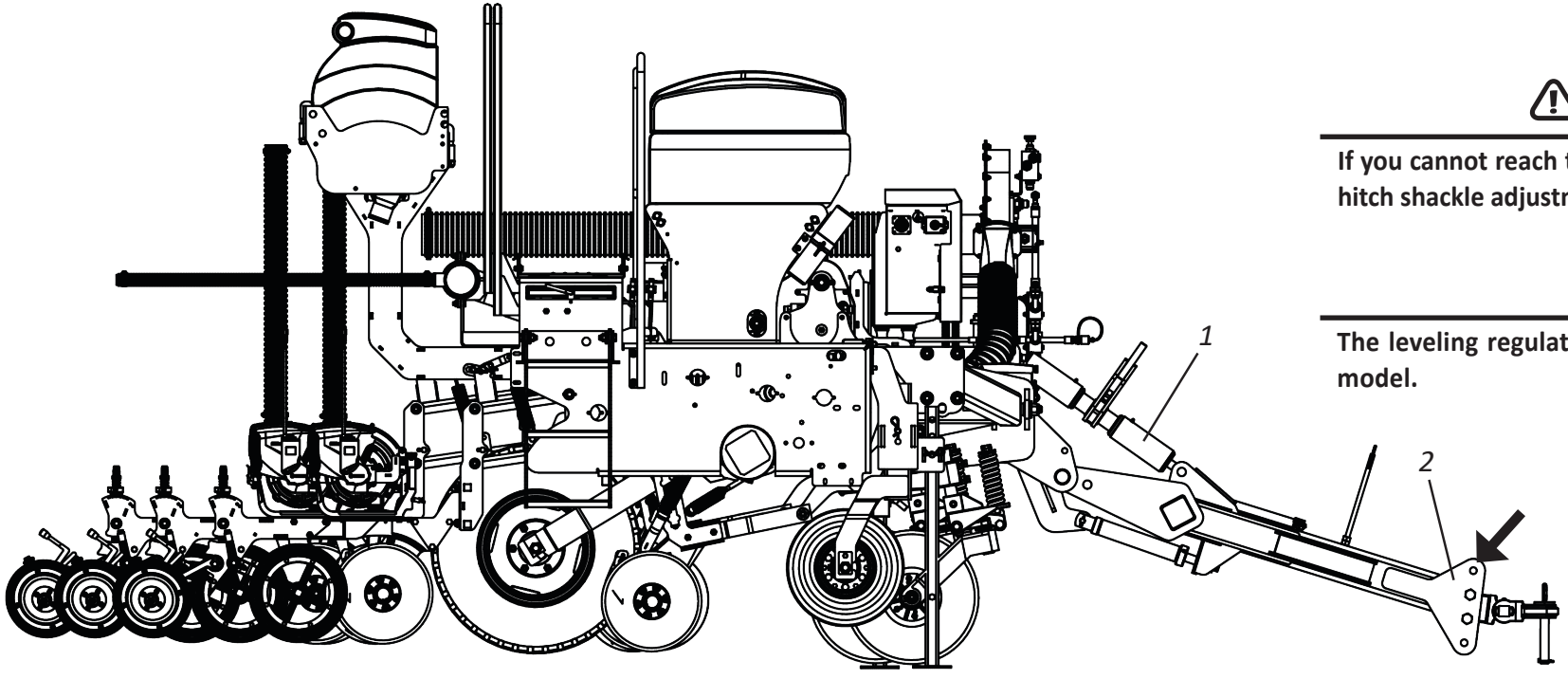
When engaging the seeder, look for a safe and easily accessible place, always use reduced gear with low acceleration.

▪ Hitch

• Levelling

When finalizing the coupling of the **TOPOGRAFIC AIR - BOSCH** to the tractor, make the leveling of it, for this, proceed as follows:

01 - Place the tractor and the seeder on a level place.
02 - Next, level the seeder using the regulator (1).



⚠ ATTENTION

If you cannot reach the level of the seeder, also use the hitch shackle adjustments (2).

NOTE

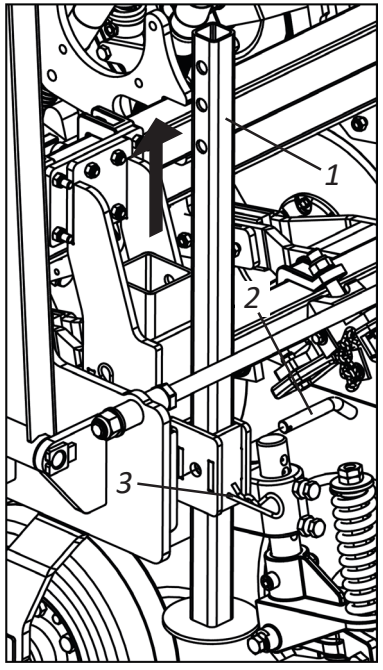
The leveling regulation varies according to the tractor model.

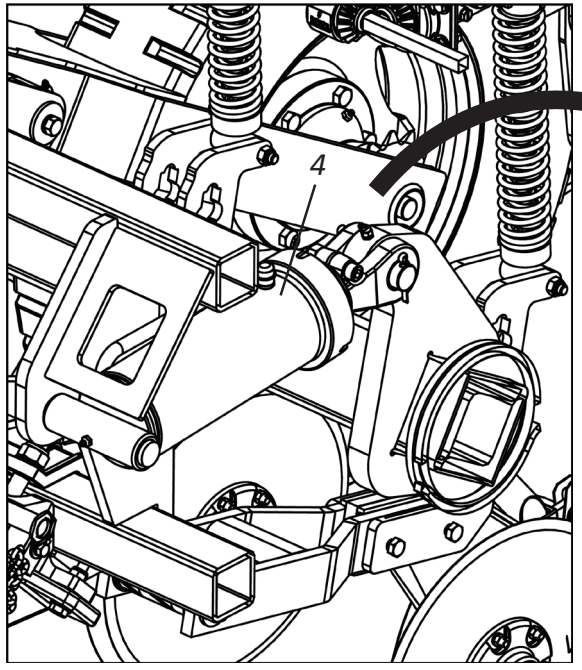
▪ Transport

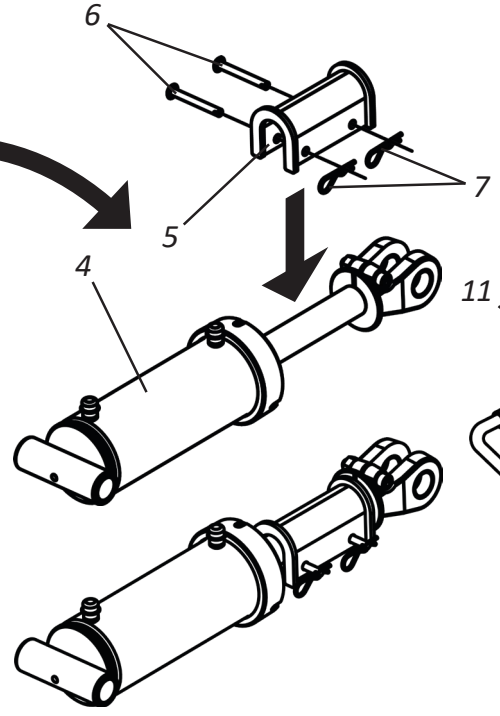
• Preparing for transport

Before transporting the seeder, proceed as follows:

01 - Collect the support bracket (1) and secure with the pin (2) and lock (3).

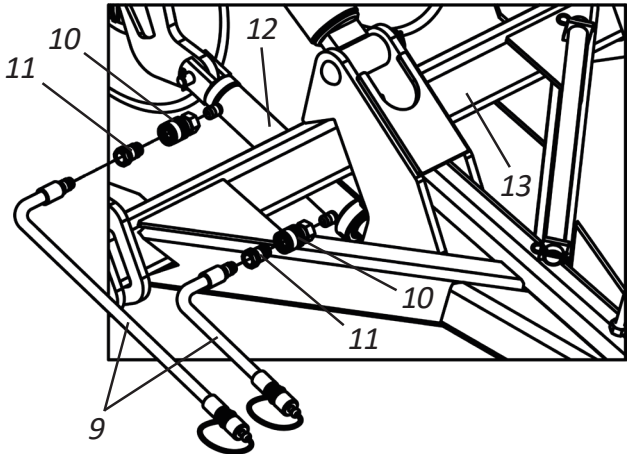






⚠ ATTENTION

Do not transport the seeder with the hoses (9) attached to the hydraulic cylinder (12) of the header (13). Ignoring this warning can cause damage, serious accident or death.



Then, with the seeder lowered, check if it is level with the ground, otherwise, level it according to the instructions on the previous page

02 - Then, lift the lines through the full activation of the hydraulic cylinder stroke (4), place the lock (5) on the rod of the same locking with the pin (6) and lock (7).

03 - Finish by removing the hoses (9) and the female (10) and male (11) quick couplers from the cylinder (12) of the header (13).

❗ IMPORTANT

Do not transport the loaded seeder as it may damage the equipment. We recommend that you supply it only at the workplace. If the seeder is to remain in the field for any reason, we recommend covering it with a waterproof tarpaulin to avoid humidity.
Do not transport the seeder without first checking the above procedures. Do not transport the seeder with the ladder open, follow the instructions on page 40.

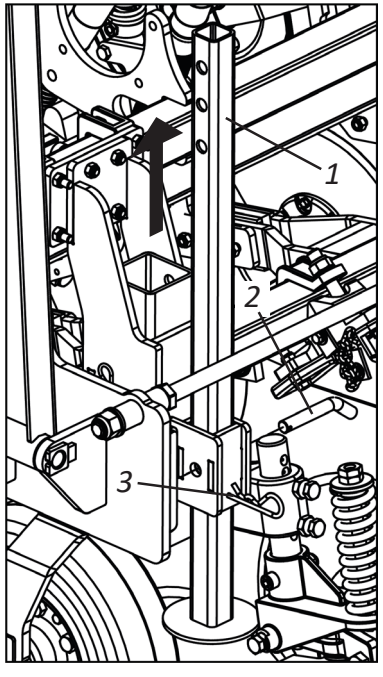
▪ Work

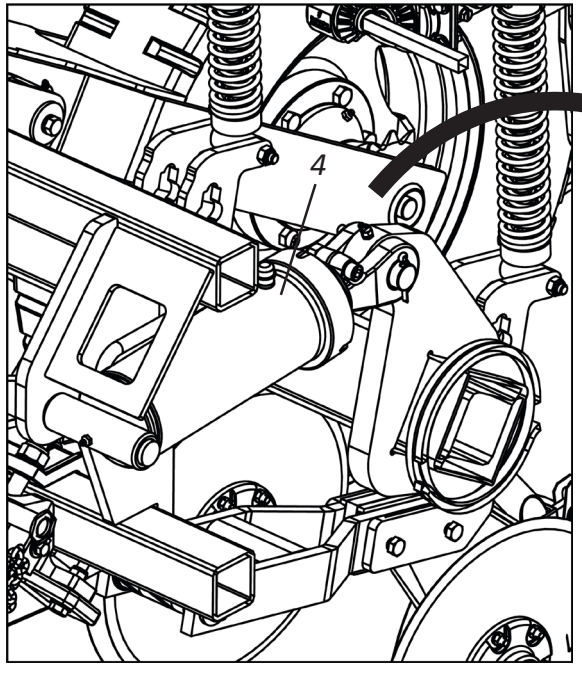
• Preparing for work - Part I

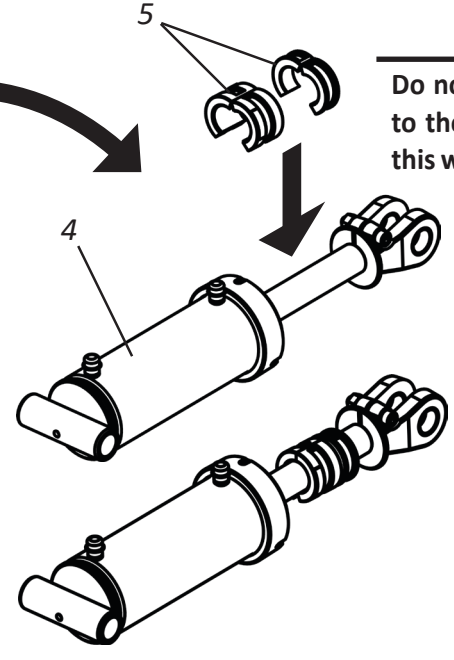
Before working with the seeder, proceed as follows:

01 - Recolha o suporte de apoio (1) e fixe com o pino (2) e trava (3).

NOTE **Always place the same number of limit rings (5) on all hydraulic cylinders (4) to lift the wheels.**

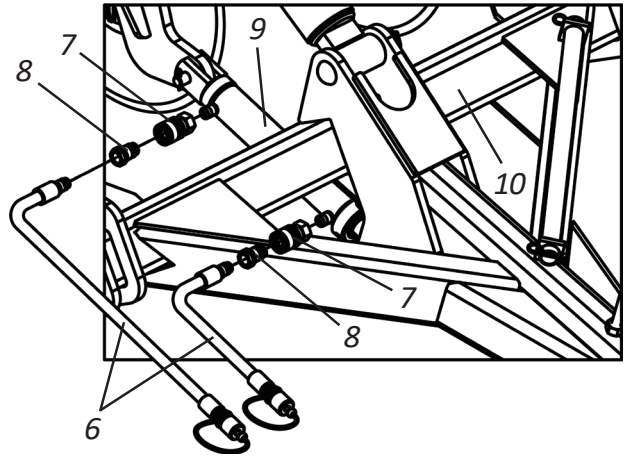






ATTENTION

Do not work with the seeder with the hoses (6) coupled to the hydraulic cylinder (9) of the header (10). Ignoring this warning can cause damage, serious accident or death.



02 - Then, with the seeder lowered, check if it is level with the ground, otherwise, level it according to the instructions on page 37.

03 - Then, lift the lines through the total actuation of the hydraulic cylinder stroke (4), place the limiting rings (5) on the rod of the same.

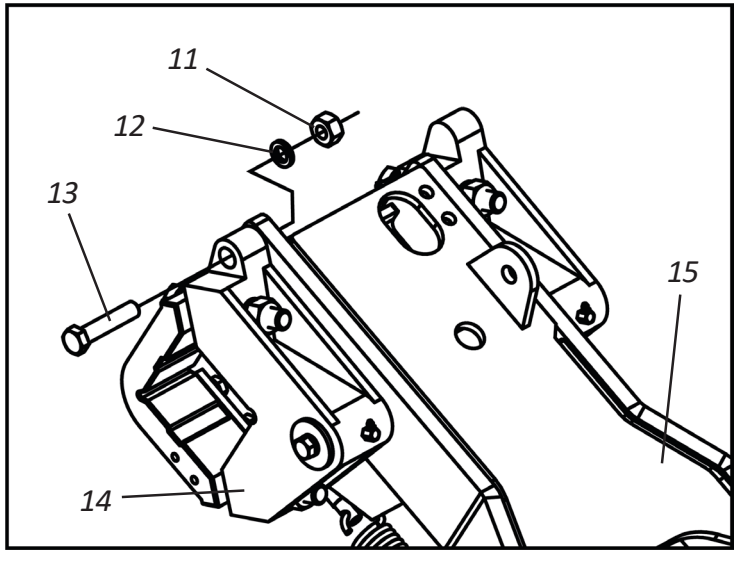
04 - Then, remove the hoses (6) and the female (7) and male (8) quick couplings from the cylinder (9) of the header (10).

IMPORTANTE **After attaching the limiting rings (5), the seeder will always operate at the same depth in both hard and loose terrain, because the limiting rings (5) are limiting the stroke of the hydraulic cylinders (4), that is, preventing the oscillation of the wheels.**
Do not work with the seeder without first checking the aforementioned procedures. Do not operate the seeder with the ladder open, follow the instructions on page 40.

▪ Work

• Preparing for work - Part II

05 - Finish by loosening the nut (11), pressure washer (12) and remove the screw (13) from the clamp (14) by loosening the wheel support (15).



⚠ ATTENTION

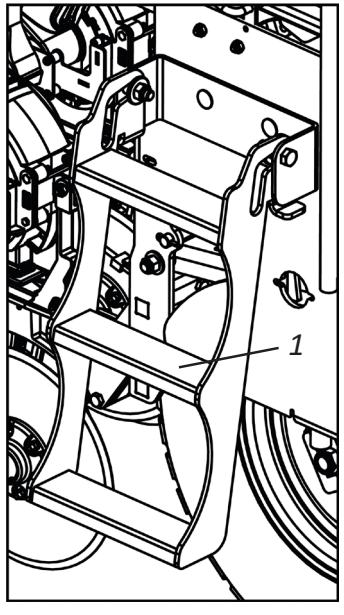
Do not work with the seeder without first removing the screw (8), lock washer (7) and nut (6) from the clamp (9) of the wheel support (10). Ignoring this warning will cause failures in planting the seeder.

• Use of the ladder

The articulated ladder (1) must only be used when filling up or servicing the **TOPOGRAFIC AIR - BOSCH** warehouses. Before using the articulated ladder (1), make sure that the seeder is stopped and the tractor is switched off.

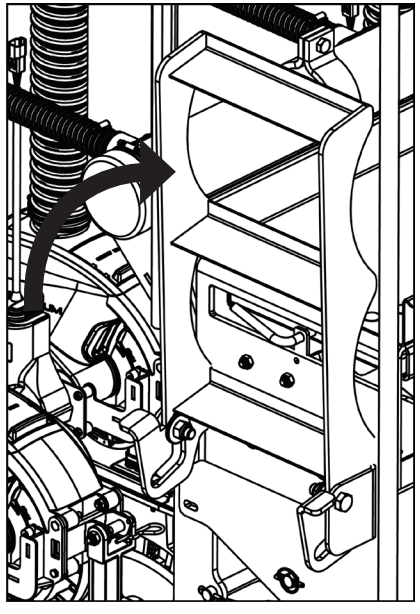
OPEN POSITION:

FOR MAINTENANCE OR SUPPLY OF THE DEPOSIT



CLOSED POSITION:

FOR WORK OR TRANSPORT



⚠ ATTENTION

Do not remain on the ladder when the seeder is working or transported.

Do not work or transport the seeder while the ladder is open.

Do not transport people on the platform, ladder or any other part of the seeder. Ignoring these warnings could result in serious accidents or even death.

❗ IMPORTANT

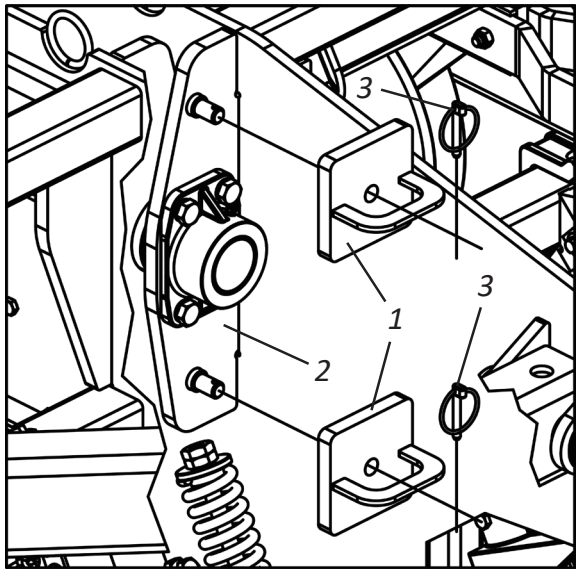
The articulated ladder (1) should only be used when filling or maintaining tanks. The articulated ladder (1) complies with NBR standards.

▪ Work / Transport

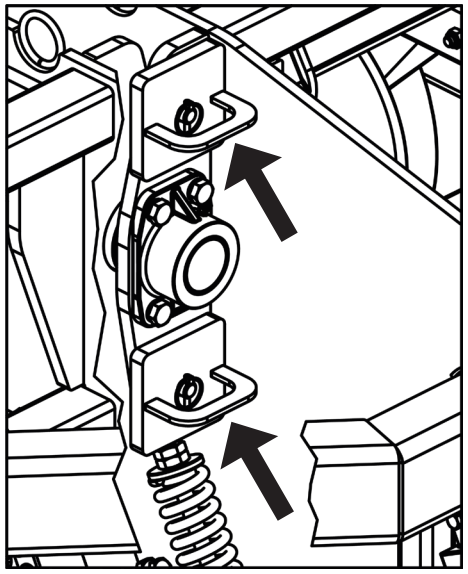
• Mounting fixing plates

The yellow fixing plates (1) must only be used for transporting and lifting the seeder. Before starting to transport or lift the seeder, place the fixing plates (1), to do so, proceed as follows:

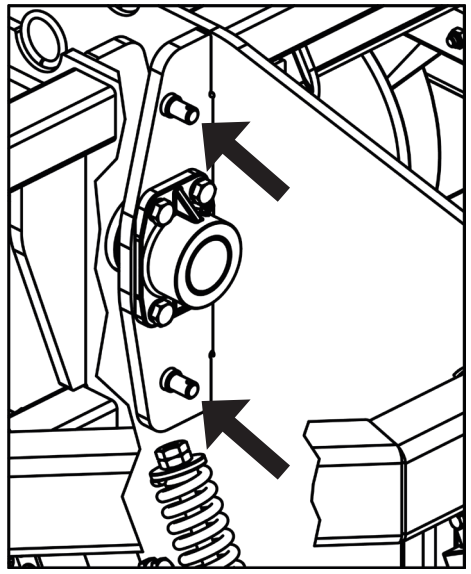
01 **-** Attach the yellow fixing plates (1) to the front and back of the upright (2) on both sides.
02 **-** Next, lock the fixing plates (1) with the ring locks (3).



WITH PLATE: FOR LIFTING



WITHOUT PLATE: FOR WORK OR TRANSPORT



ATTENTION | **Do not lift the seeder without first placing the fixing plates (1). Ignoring this warning could cause serious accidents or damage to the seeder.**

IMPORTANT | **Before starting work with the seeder, remove the fixing plates (1). Ignoring this warning will override the seeder linkage system, i.e. the seeder will not copy the soil.**

NOTE | **The fixing plates (1) must be mounted on the front and rear of the seeder on both sides.**

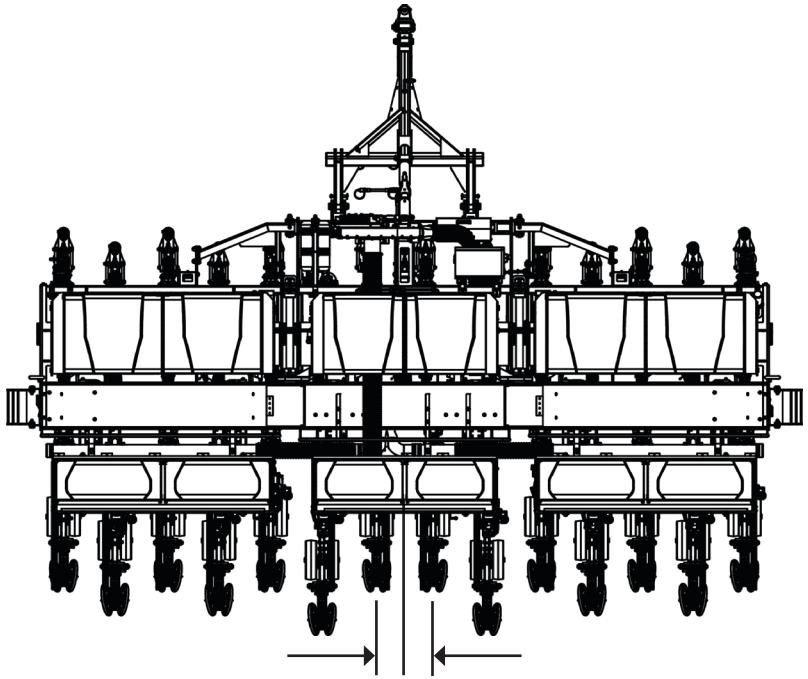
Spacing

• Line spacing

TOPOGRAFIC AIR - BOSCH seeders are supplied with spacing according to the number of lines requested, and new spacings can be made according to the desired type of crop.

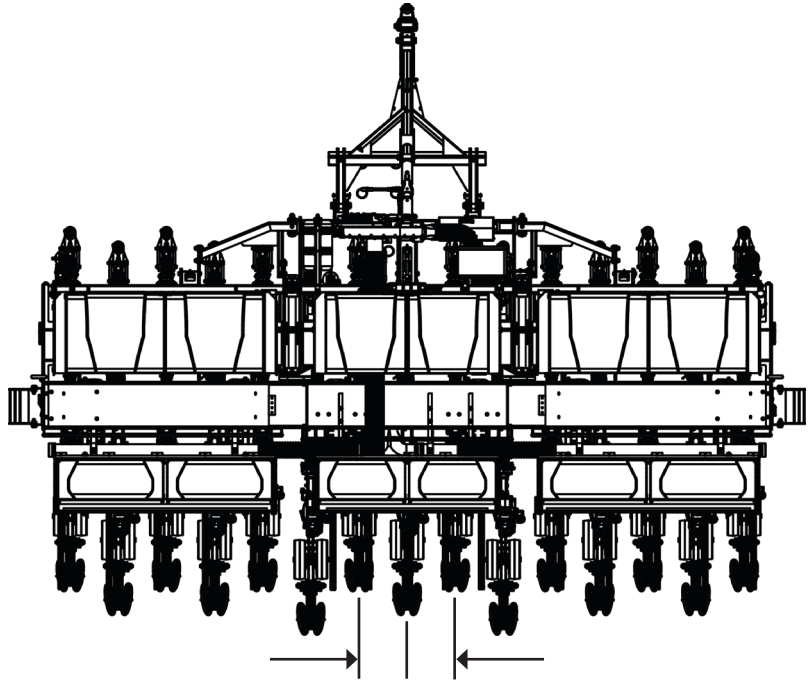
• Number of even lines

Mark the center of the **TOPOGRAFIC AIR - BOSCH** chassis and divide 1/2 (half) spacing to the left and 1/2 (half) to the right, fixing the first two lines at these points. Then, starting from these, make the assembly of the other lines with the desired spacing.



• Number of odd lines

Fix a line in the center of the **TOPOGRAFIC AIR - BOSCH** chassis and starting from this, assemble the others with lines with the desired spacing.



ON THE FOLLOWING PAGE, CHECK THE POSSIBLE SPACES, OBSERVING THE ABOVE ASSEMBLY INSTRUCTIONS TO ASSEMBLE THE QUANTITY OF UNIQUE OR UNIQUE LINES.

▪ Spacing

• Spacing table in millimeters

TOPOGRAFIC AIR - BOSCH seeders are supplied with spacing according to the number of lines requested, and new spacings can be made according to the desired type of crop.

Model	Nr of rows	Spacing (mm)
6500	15	450
	14	500

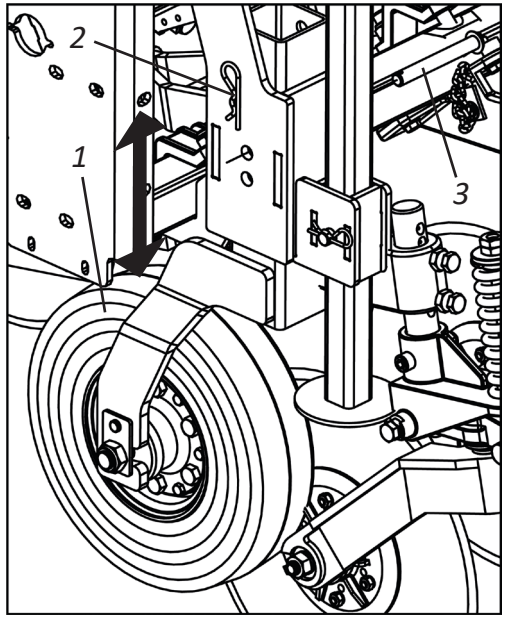
⚠ ATTENTION | **Any spacing other than that shown on this page, consult the product engineering department.**

▪ Adjustments

• Adjusting the depth limiting wheel of the side frames

In order for the lines of the frames to have the same depth as the lines of the central frame, adjust the depth limiting wheel (1) of the side frames, to do so, proceed as follows:

01 - Release the lock (2) and remove the pin (3).
02 - Then, adjust the depth limiting wheel (1) according to the **TOPOGRAFIC AIR - BOSCH** wheelset.
03 - Then, replace the pin (2) and lock (1) fixing it.



⚠ ATTENTION | **The depth limiting wheels (1) of the side frames must have the same adjustment.**

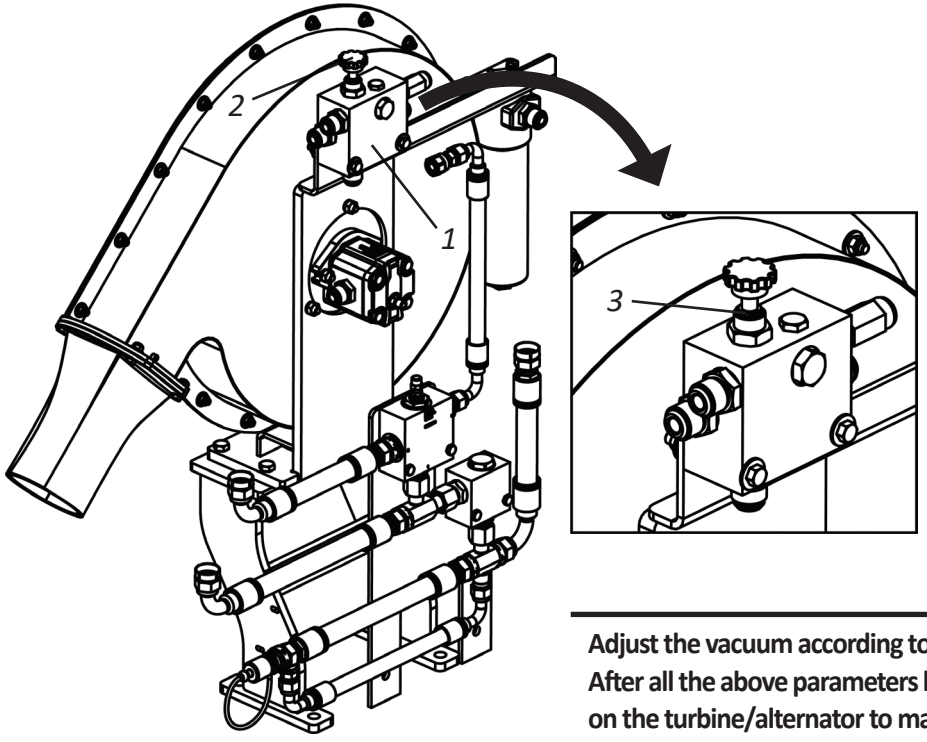
▪ Adjustments

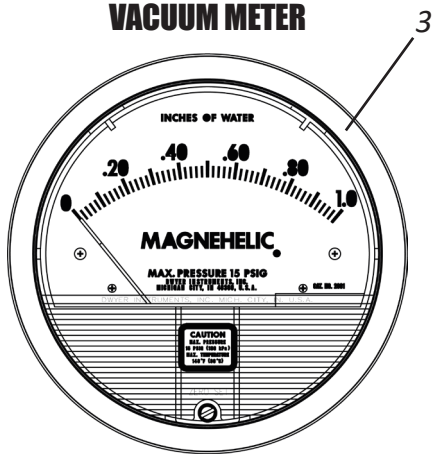
• Continuous flow system adjustment - Negative Pressure

TOPOGRAFIC AIR - BOSCH has a continuous flow system. In this system, when you verify the seed drop from the disc when maneuvering the seeder, gradually open the flow regulating valve (1) increasing the flow, to do so, proceed as follows:

01 - Turn the handle (2) of the flow regulating valve (1) counterclockwise, until you see that the fact no longer occurs.

02 - At the end of the adjustment, lock the flow regulating valve (1) through the counter nut (3) contained in the handle (2), turning it clockwise with an appropriate tool so that eventually the system does not suffer from adjustment.





IMPORTANT

Before starting the adjustment of the valve (1), make sure that the turbine is fully open, according to the instructions on the next page. Failure to do so may result in you not being able to reach the desired mbar (millibar).

ATTENTION

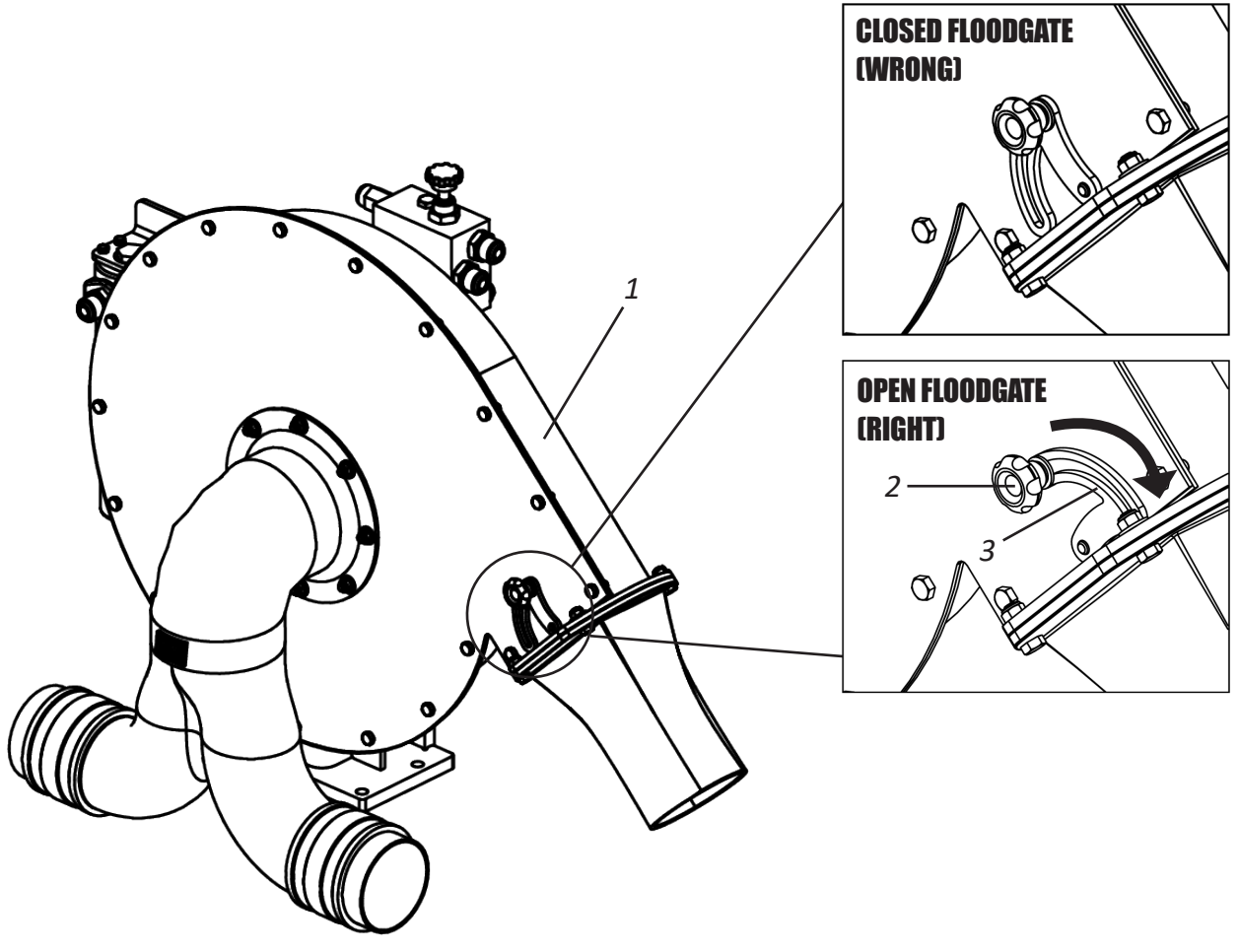
Adjust the vacuum according to the instructions in item (Distribution of seeds) on page 54.
After all the above parameters have been adjusted and the seed still drops during maneuvers, use the tractor command with priority valve on the turbine/alternator to maintain the flow necessary to hold the seed on the disc.
For the correct operation of the equipment, the minimum required flow of the turbine/alternator is 52 l/min, with the alternator 20 l/min and the turbine 32 l/min.

▪ Adjustments

• Turbine

The turbine (1) must generate a negative pressure (vacuum) determined, depending on the specific weight of the seed that will be used. Before starting work, make sure that the floodgate is fully open, if not, proceed as follows:

01 **-** Release the handle (2) by turning it counterclockwise.
02 **-** Then, completely move the plate (3) to open it.
03 **-** Then, tighten the knob (2) by turning it clockwise.



⚠ ATTENTION

The turbine floodgate (1) must always be fully open.
DO NOT work with the floodgate closed.

▪ Seed dispensing system

• SELENIUM Batcher

TOPOGRAFIC AIR BOSCH leaves the factory with the **SELENIUM** seed meter.

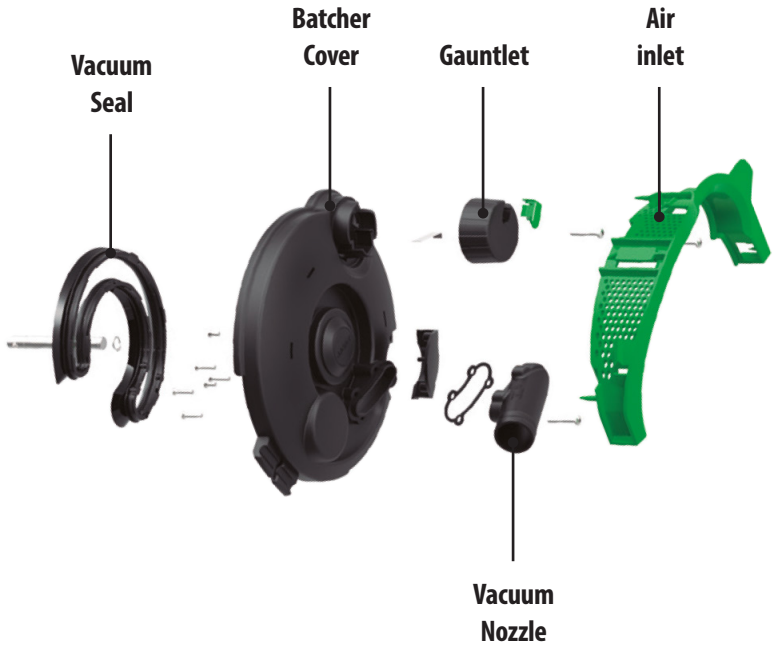


• TECHNICAL SPECIFICATIONS

Pneumatic Batcher.
No need for adjustments and regulations.
It has a display to monitor the operation in real time.
Dimensions: 414 mm (H) x 206 mm (W) x 373 mm (L).
Weight: 3 Kg.
Vacuum nozzle diameter: 36.5 mm.
Seed nozzle diameter: 74 mm (gravity) or 32 mm (positive pressure).

• Available crops

COTTON | CORN | CARIOCA BEAN | SORGHUM | SOY BEAN



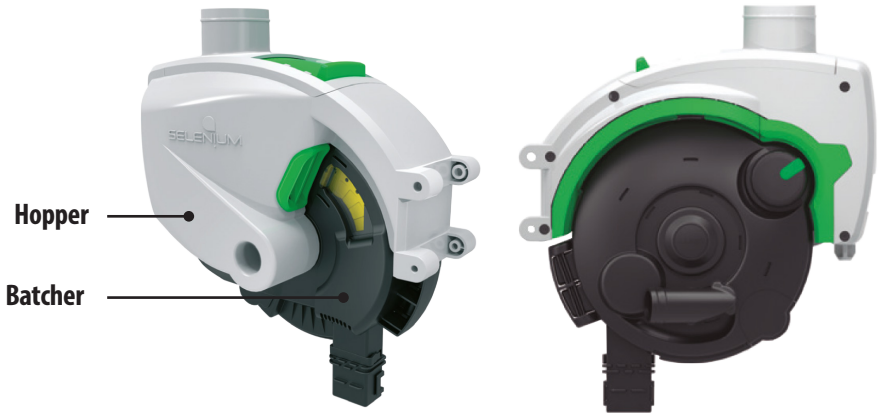


CONDUCTOR

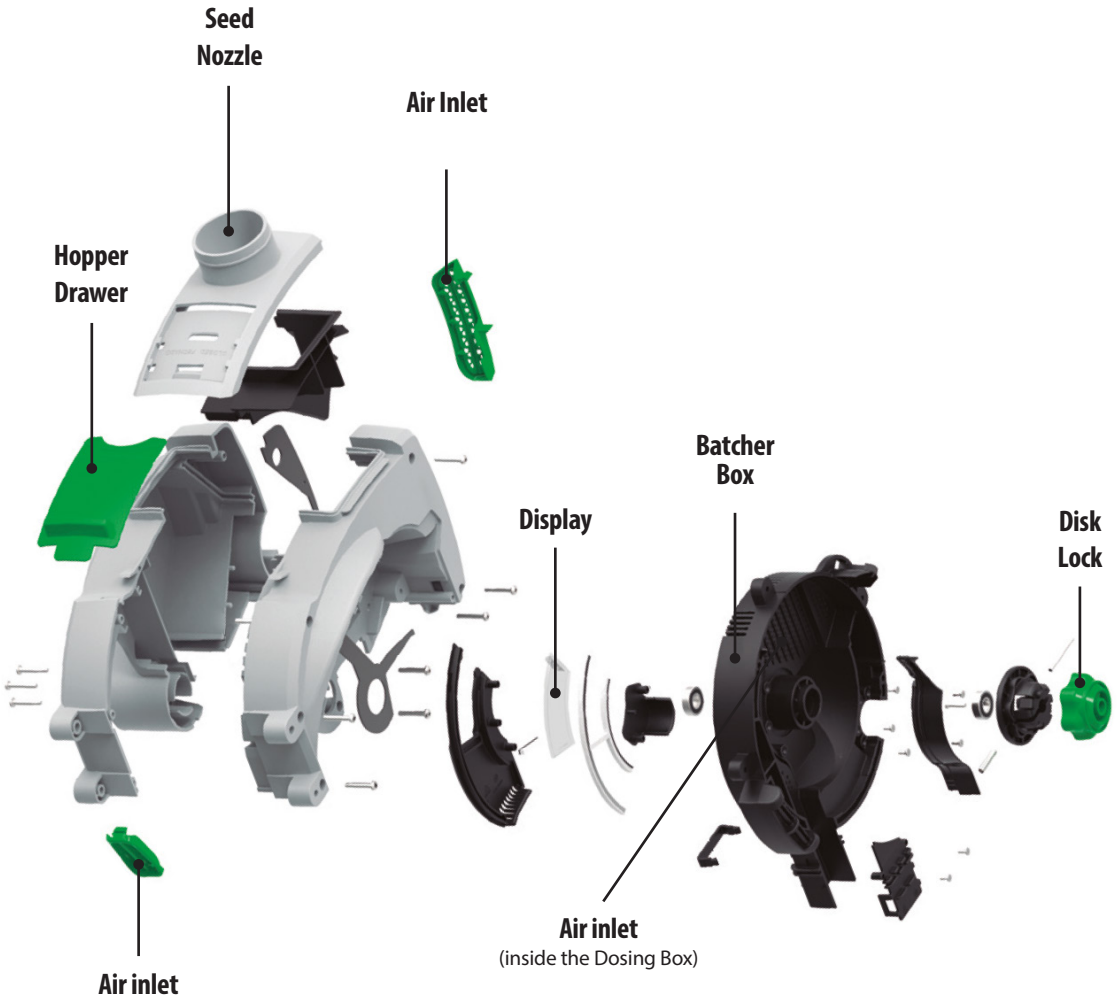
Coupled with Selenium, it protects and guides the seed to the ground.

▪ Seed dispensing system

• SELENIUM batcher components







▪ Seed dispensing system

• Crop choice

The **SELENIUM** batcher has **three distinct sets of discs** with their respective organizer and rosette; **for corn, flow soybean** and **soybean** plantations.

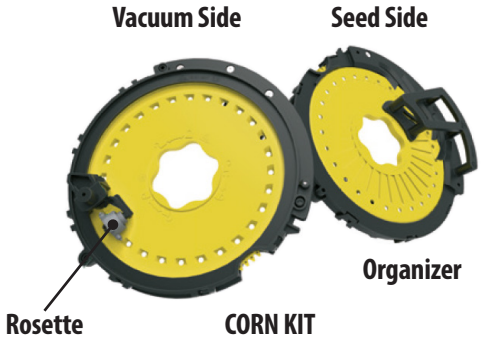
NOTE **The disc set has no adjustment and also must not be disassembled.**

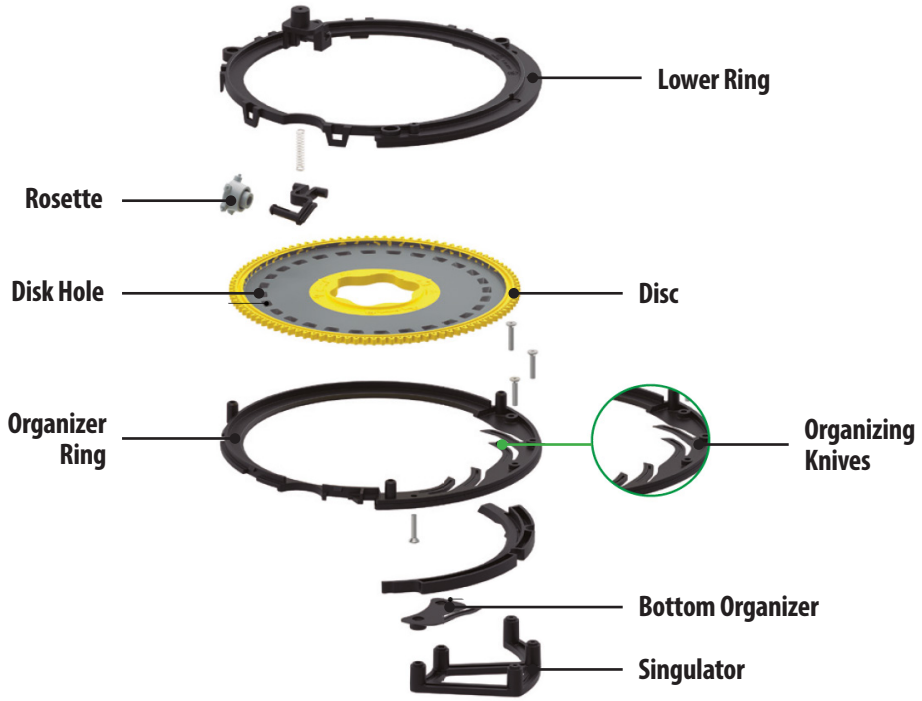
Choose the specific set for the desired crop according to the **disc colors.** The table below relates the color of the disc with the planting crop.

CROPS	CODES	NUMBER OF HOLES	HOLE DIAMETER
CORN	YELLOW	28	4.5 mm
SOJA FLOW	LILAC	40	4.0 mm
SOYBEAN	ORANGE	55	4.0 mm



Description of the 3 (three) kits (consisting of disc, organizer and rosette) and respective crops.





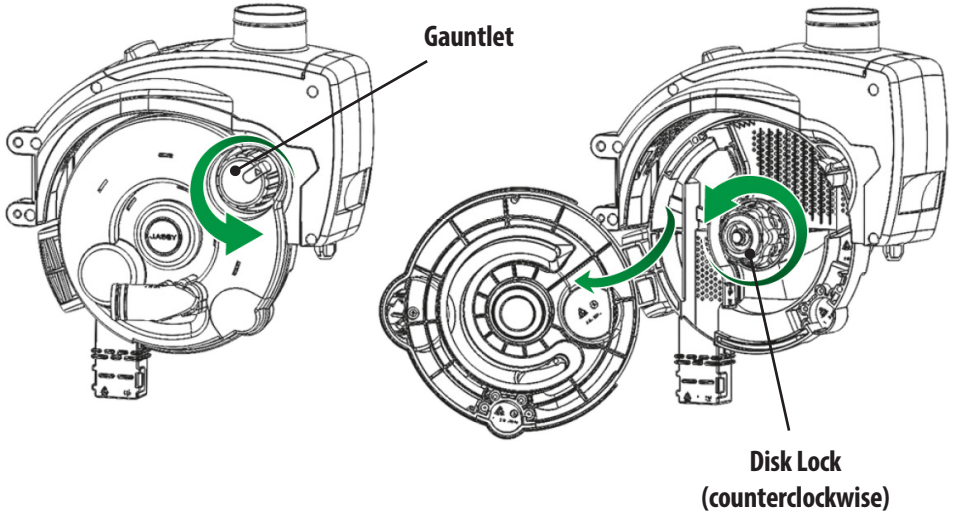
▪ Seed dispensing system

• Disk choice

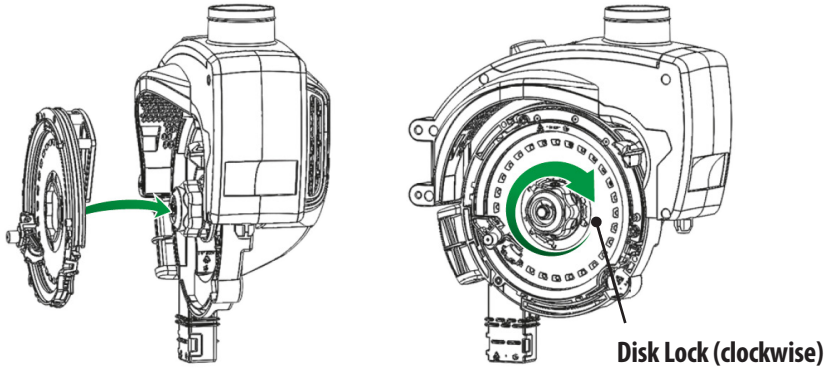
For mounting the selected disc set on the batcher, it is not necessary to remove the **Dispenser from the Hopper.**

01 - Open the batcher cover by turning the Handle **counterclockwise.**

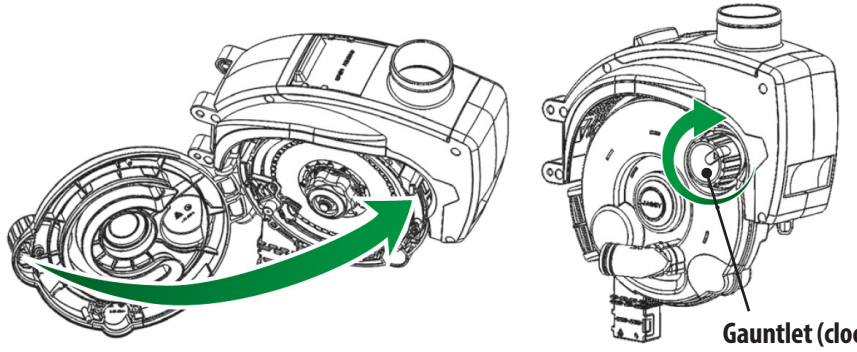
02 -Turn the disc lock **counterclockwise** until the end of its course.



03 - Assemble the disc set with the **Singulator** (Organizers) facing inside the batcher. After positioning the assembly, **turn the disc lock clockwise** to lock the assembly.



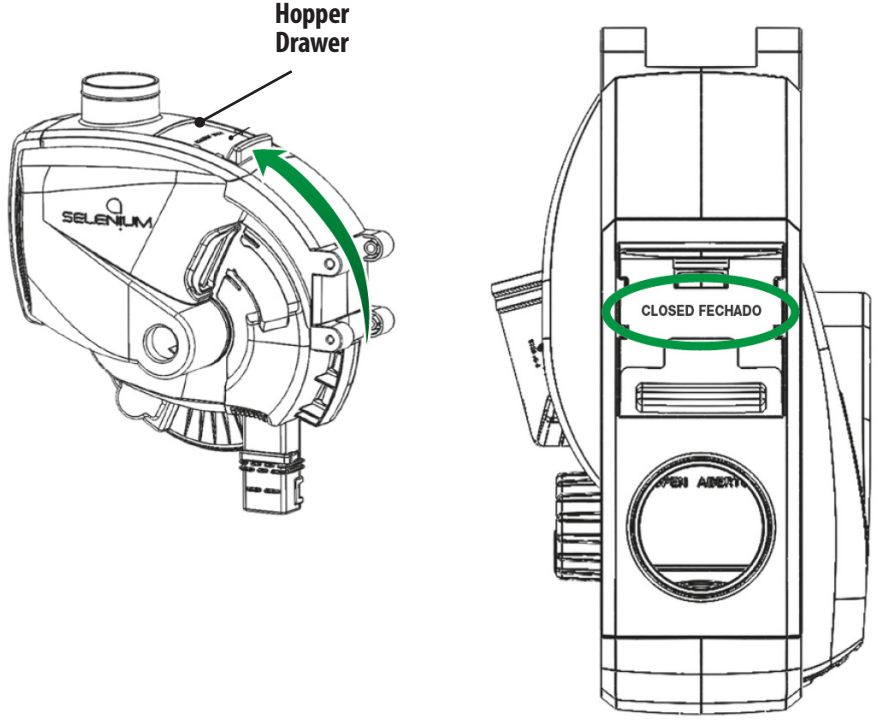
04 - Close the lid pressing it against the batcher box until the **handle** locks. Make sure the cover latch has closed properly.



▪ Seed dispensing system

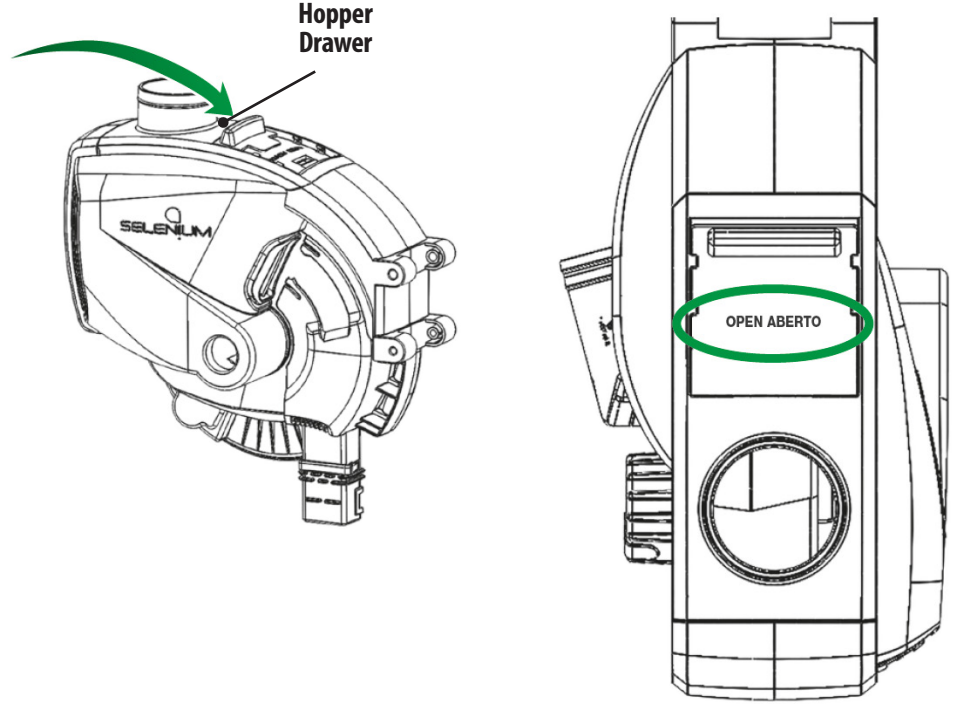
• Crop change with the seed-filled SELENIUM batcher

01 - Push the **Hopper** drawer, in the direction indicated in the image below, until the end of the course. In this position, the **Hopper** will be closed, displaying the indication **"CLOSED".**



02 - Repeat the operations of the **"Disk Set"** topic of this manual.

03 - Reopen the **Hopper Drawer**, in the direction indicated below, until the end of the course. In this position, the Hopper will be open, displaying the indication **"OPEN".**



▪ Seed dispensing system

• Display

The **SELENIUM** batcher has a display that offers the possibility to follow the result of the organization of the seeds inside the batcher. To open the display, just slide it as shown in the image on the side.



After checking the singularity, keep the display closed.

▪ Seed dispensing system

• Troubleshooting (SELENIUM Doser) - Part I

1 - EXCESS OF FAILURES

FAILURES are characterized by the lack of seeds in the holes of the discs (they are verified by the display). Its incidence can be reduced with the following actions:

a) Check that the choice of disc set has been made correctly (page 48) in this manual.
b) Check that there are no fragments lodged in the disc holes.
c) Check that the seeds are correctly graphited. **The use of powdered and dry graphite, applied to the seeds and mixed evenly, is essential to make the seeds easy to move inside the batcher.** In this way, the seeds are more easily captured by the hole in the disc.
d) Make sure the **vacuum pressure** is set correctly. If the failures (lack of seeds) persist, try to increase the working pressure until the failures are reduced as much as possible. Then check **that there are no doubles**.
e) Check **the seal**, make sure it is in good condition.

2 - EXCESS OF DOUBLES

The **DOUBLE** ones are characterized by the presence of two or more seeds in the holes of the discs (they are verified by the display). Its incidence can be reduced with the following actions:

a) Check that the **choice of disc set** has been made correctly (page 48).
b) Check the **organizing knives**, make sure they aren't frayed from overuse.
c) The **seeds must be correctly graphited**. The use of powdered and dry graphite applied to the seeds and, mixed uniformly, is essential to make the seeds easy to move inside the batcher. In this way, they will be separated from each other more easily by the organizer.
d) Make sure the **vacuum pressure** is set correctly. **If the doubles persist, reduce the working pressure until the doubles are reduced as much as possible. Then check if there are no errors.**

▪ Seed dispensing system

• Troubleshooting (SELENIUM Doser) - Part II

3 - SPACING FAILURE

If the **spacing between seeds in the soil** is impaired, we recommend the following actions:

a) Check the **metering seed outlet and the seed conductor**. Debris lodged in its walls can deflect the course of the seeds.
b) Check the traction system. Make sure the system is in good condition and well lubricated.
c) Try turning the batcher manually. Look for any unusual signs or sounds as you rotate. If it is turning hard, remove the disc, organizer and rosette assembly looking for any debris that is making the assembly difficult to turn.
d) Look for marks or evidence of where the seed is making contact with the seed conductor. Make sure the Selenium is positioned so that the seed lands in the middle of the seed conductor.
e) Check that the **batcher air inlets are clear** (see pages 46 and 47) to allow free air flow into the batcher.
f) Check that the seeds are correctly graphited. The use of powdered and dry graphite, applied to the seeds and mixed evenly, is essential to make the seeds easy to move inside the batcher. Thus, they will detach from the disc at the correct time. **In case of wet weather, increase the dosage of graphite in the seeds.**
g) Decrease the speed to verify if the problem is being caused by the excessive vibration of the planting line.
h) If you have a seed sensor on the conductor, check if the installation is correct. The sensor must not extend beyond the inner wall of the conductor.

4 - INCORRECT POPULATION

If the seed population in the soil is not in accordance with the desired one, the following actions can be taken:

a) If the batcher is driven by a **hydraulic motor** or **electric motor**, check that **the number of holes on the disc is correctly configured** on the terminal that controls the motors. Also check that the **population indicated on the display** is correct.
b) If the batcher is mechanically driven by the drive wheel of the planter, check in the dosage table if the correct gears are being used in the gear box (which moves the seed batchers).

▪ Seed dispensing system

• Ratio of speed x seed rate

The values below refer to the SOYBEAN crop, based on SPEED x SEED RATE x NUMBER OF DISK HOLES.

EXAMPLE: To work with a rate of up to 20 seeds per meter, at a speed of 6 km/h, use the 40-hole disc. If desired, work with rates above 20, use the 55 hole disc.

SOY DISCS				
MAXIMUM SPEED KM/H	MAXIMUM SEED RATE S/M (SEED PER METER)	NUMBER OF DISC HOLES	MAXIMUM ENGINE (RPM)	
6	20	40	50	✓
7	17	40	50	
6	28	55	50	✓
7	24	55	50	

⚠ATTENTION **Respect the speed x seed rate limits, according to the table above; if it does not comply, it will not reach the seed rate per meter;**

• Seed distribution

To regulate seed distribution, initially leave the pressure at 50 mlbar (500mm H20) and check the display or sensor for the singulation (doubles and failures during planting).

GIVING FAILURES:	INCREASE THE PRESSURE.
GIVING DOUBLE:	REDUCE PRESSURE.

▪ Seed dispensing system

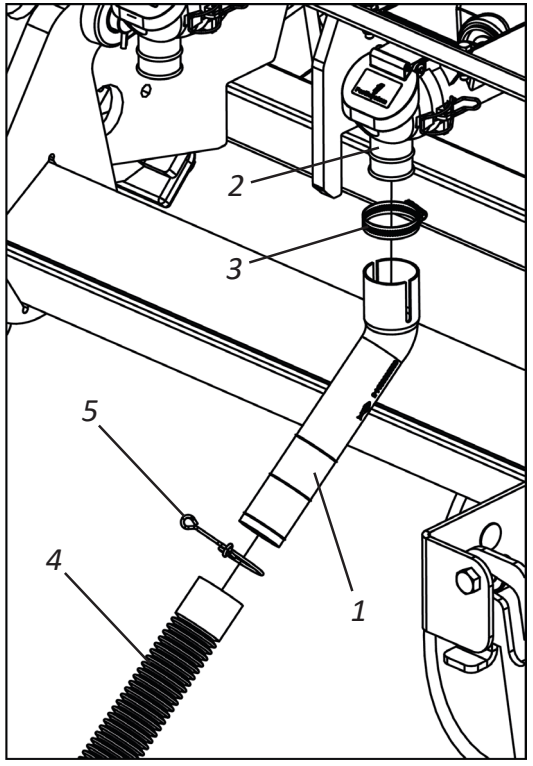
• Seed configuration.

Before starting the work, configure the seed screen, for that, **proceed according to the instructions on page 105, item B.**

▪ Fertilizer Distribution System

• Fertisystem Fertilizer Conductor - Part I

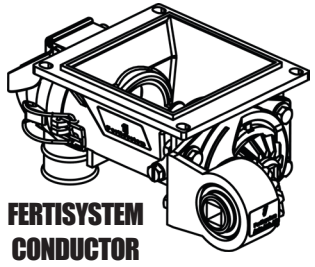
To carry the fertilizer from the batcher to the ground, fit the spouts in degree (1) to the fertisystem conductor outlets (2) through the clips (3). Then place the hoses (4) on the nozzles in degree (1) through the lock spring (5).

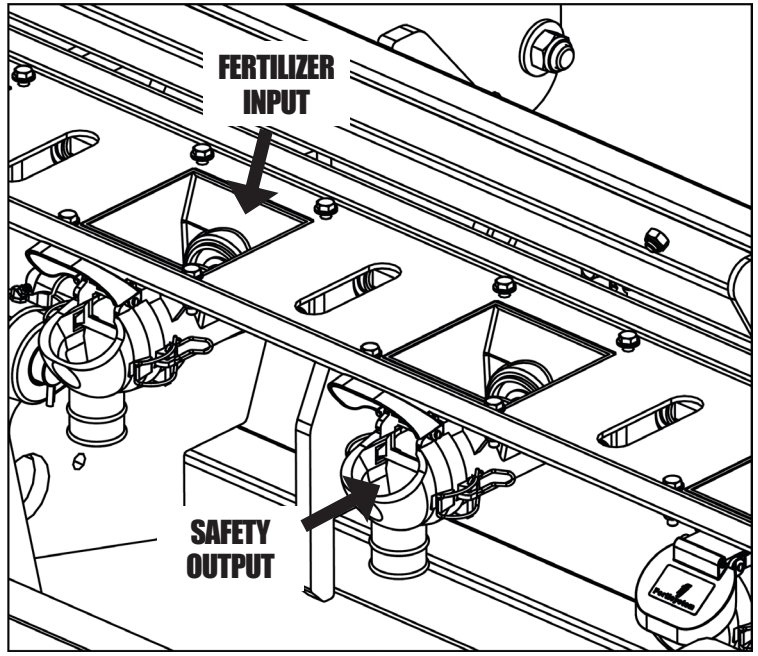


▪ Fertilizer Distribution System

• Fertisystem Fertilizer Conductor - Part II

The Fertisystem system has safety outputs that guarantee the proper functioning of the system without damaging it. In case of clogging of the hose and the batcher, clean the batcher until the end of the hose near the furrower rod or double disc, as the system may become clogged by roots, pieces of plastic and other objects.





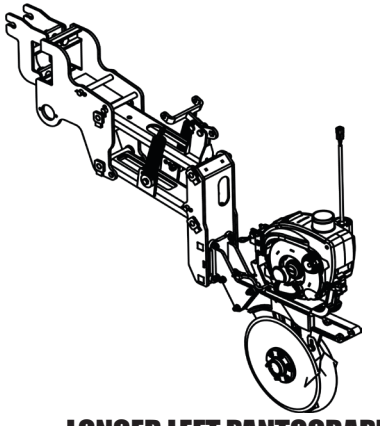
⚠ ATTENTION | **Check batchers and hoses daily and clean their outlets. When the fertilizer has impurities or is damp, clean it more often.**

• Fertilizer setting.

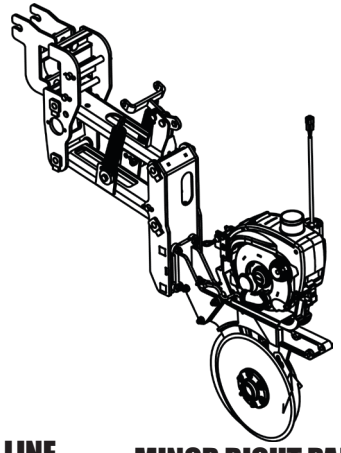
Before starting the work, configure the fertilizer screen, to do so, **proceed according to the instructions on pages 111 to 118.**

▪ Planting lines

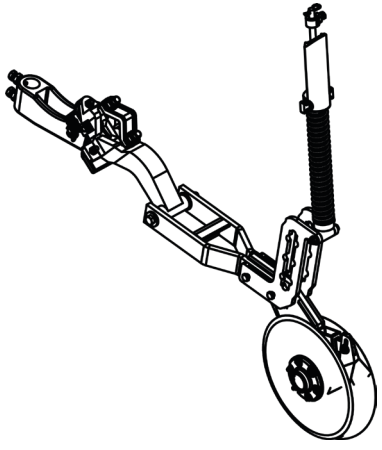
- Models of lines and planting carts



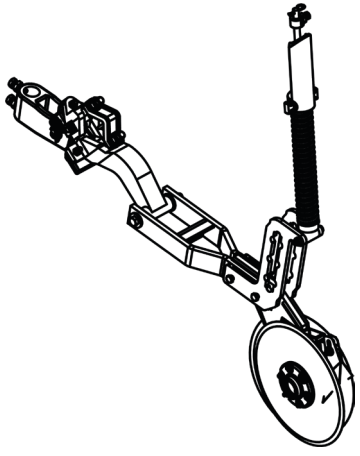
LONGER LEFT PANTOGRAPHIC LINE
SELENIUM WITH BOSCH ENGINE



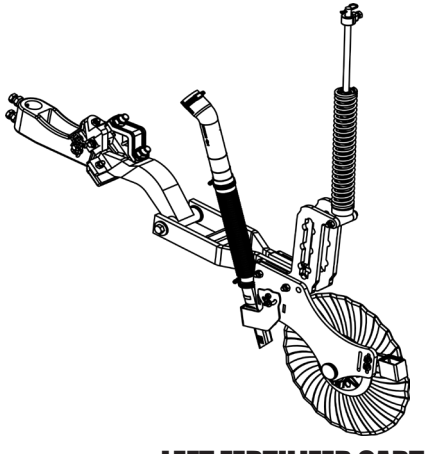
MINOR RIGHT PANTOGRAPHIC LINE
SELENIUM WITH BOSCH ENGINE



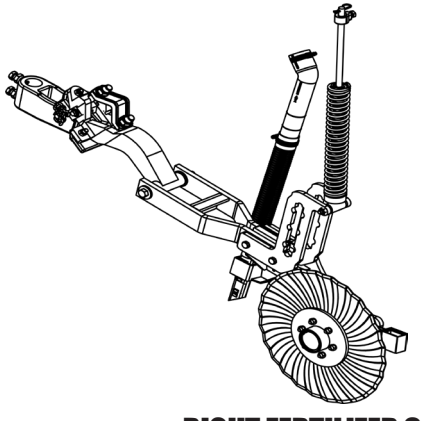
LEFT FERTILIZER CART WITH
CUTTING DISC SUPPORT



RIGHT FERTILIZER CART WITH
CUTTING DISC SUPPORT



LEFT FERTILIZER CART
WITH 18" TURBO DISC
BRACKET



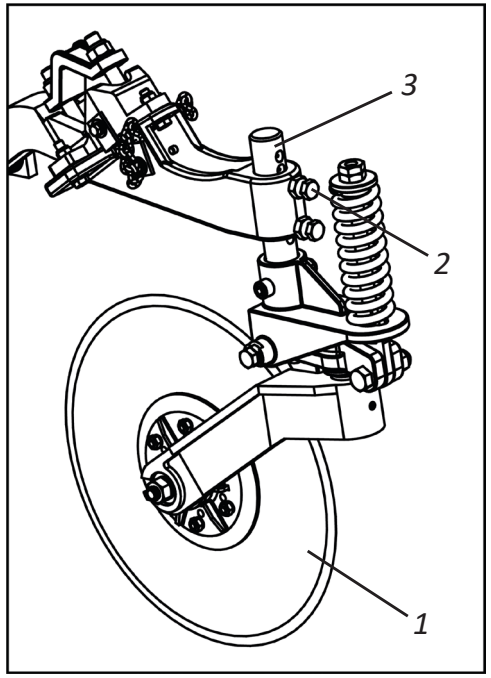
RIGHT FERTILIZER CART
WITH 18" TURBO DISC
BRACKET

▪ Adjusting the lines

• Adjusting the cutting disc depth

To adjust the depth of the cutting disc (1), proceed as follows:

01 - Loosen the screws (2) and move the shaft (3) to the desired adjustment.
02 - 02 - Then, retighten the screws (2).



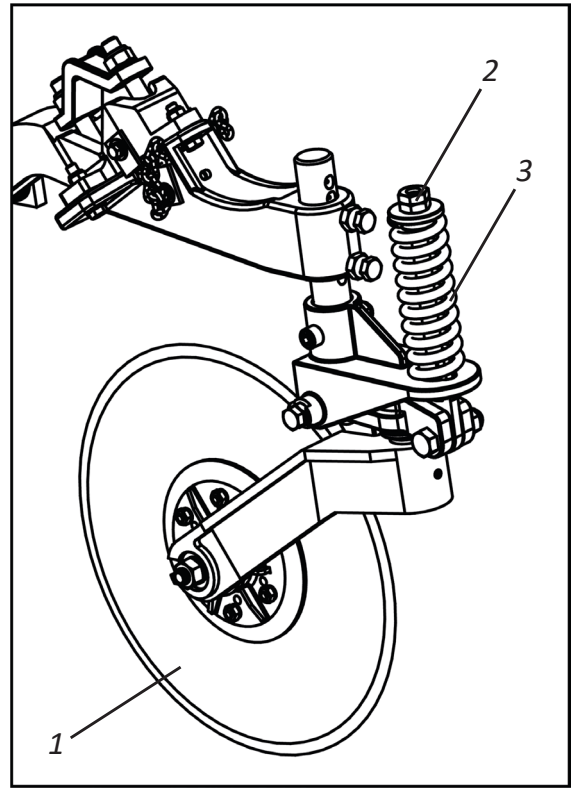
⚠ ATTENTION **When adjusting the pressure of the cutting disc, take care not to cancel the articulating action of the cutting disc.**

• Adjusting the cutting disc pressure

To adjust the pressure of the cutting disc (1), proceed as follows:

01 - Turn the nut (2) clockwise to increase pressure on the spring (3).
02 - Turn the nut (2) counterclockwise to decrease pressure on the spring (3).

PRESSURE REGULATION
(+) INCREASED SPRING PRESSURE:
INCREASED PRESSURE OF CUTTING DISC IN THE SOIL.
(-) DECREASED SPRING PRESSURE:
DECREASED PRESSURE OF CUTTING DISC IN THE SOIL.

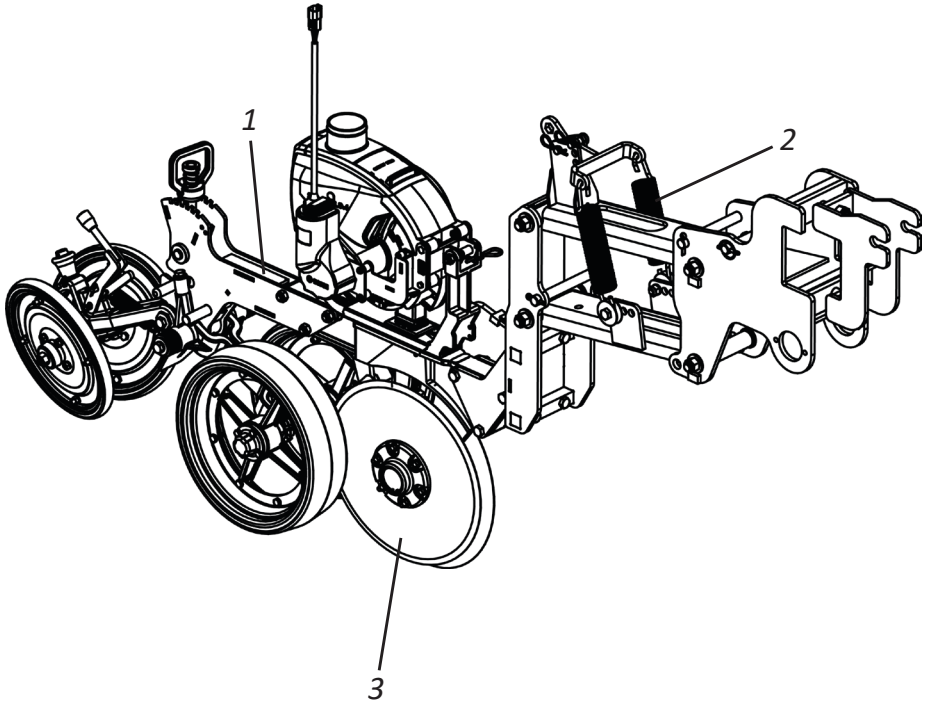


❗ IMPORTANT **The depth and pressure adjustments of the cutting disc must be made in the field before starting work, observing the type of soil to be worked, to obtain a better performance of the seeder.**

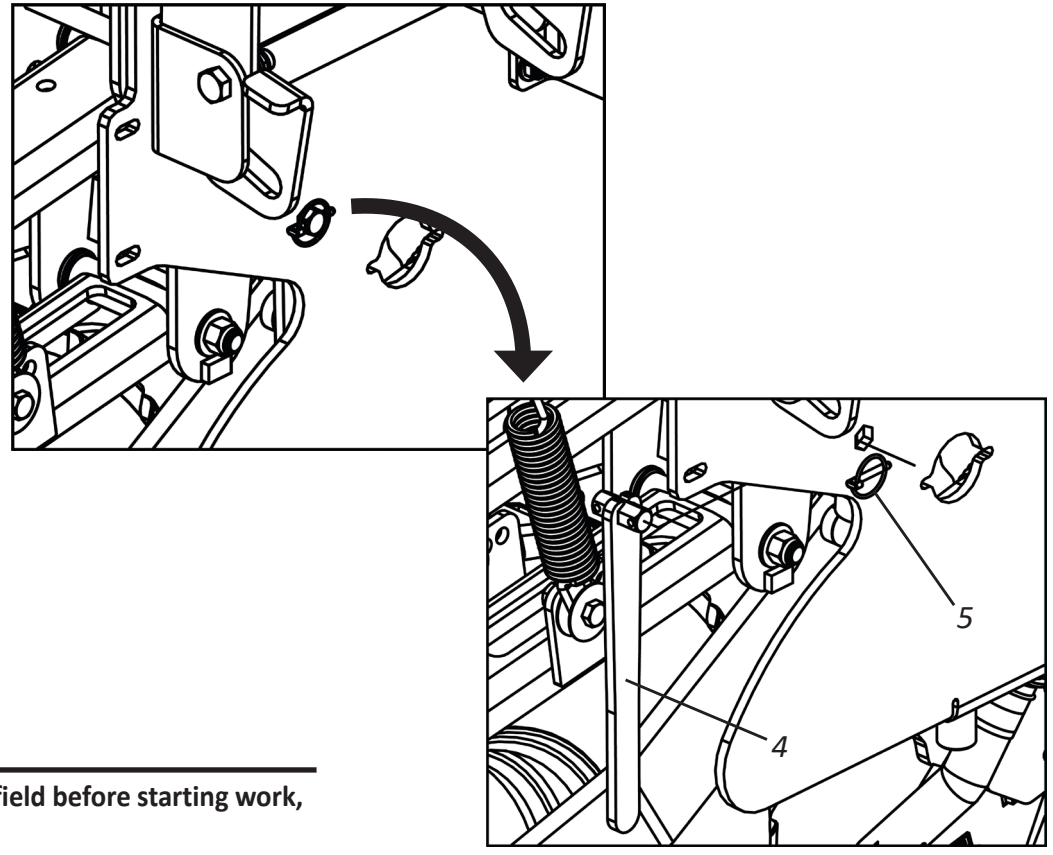
▪ Adjusting the lines

• Spring Pressure Adjustment - Part I

The line (1) has a pressure spring (2) that, when regulated to give more or less pressure, will increase or decrease the force on the double disc (3). To adjust the spring pressure (2), proceed as follows:



01 - Take the key (4) that is fixed on the side of the seeder, releasing it through the ring lock (5).



NOTE

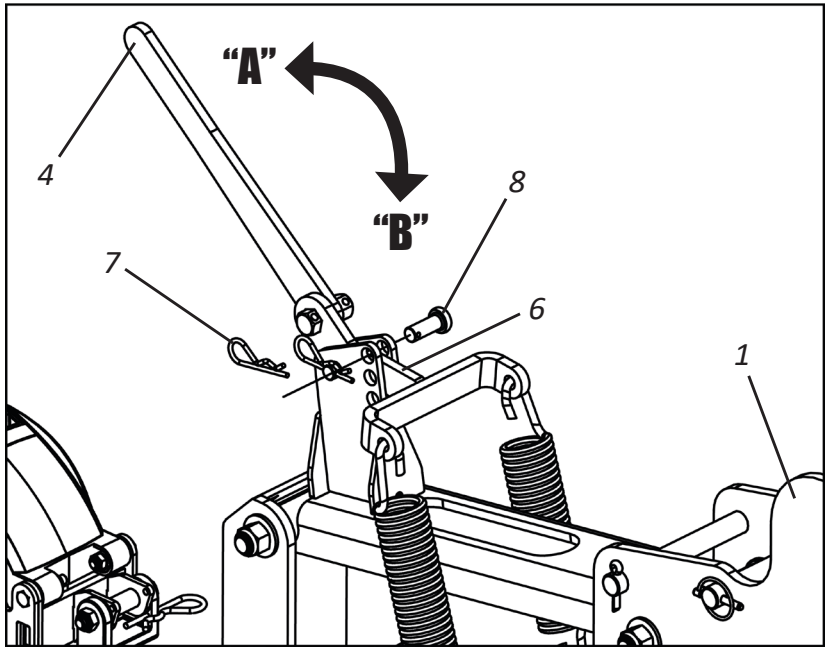
This adjustment, giving greater or lesser pressure to the spring, should be done in the field before starting work, observing the type of soil to be worked for better seeder performance.

▪ Adjusting the lines

• Spring Pressure Adjustment - Part II

02 - Then, place the key (4), on the lever (6) of the line (1), release the lock (7), remove the pin (8). Then, move the key (4) by adjusting the lever (6) to the desired position.

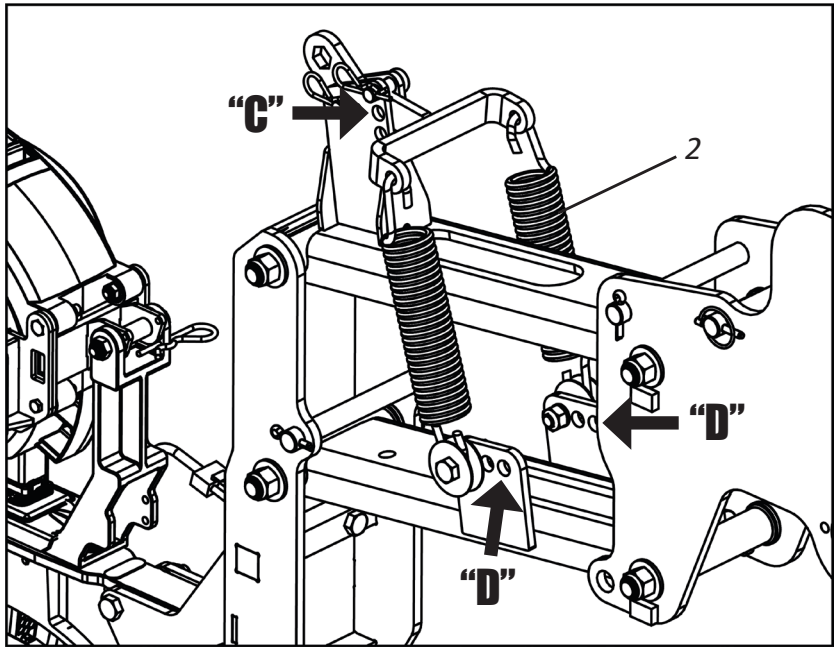
03 - Finish, locking the lever (6) again, with the pin (8) and lock (7).



POSITION "A"	MORE PRESSURE ON THE SPRING.
POSITION "B"	LOWER PRESSURE ON THE SPRING.

⚠ ATTENTION

When adjusting the spring pressure (2), check which of the adjustment points "C" best meets your work needs. If these adjustments still do not achieve the desired result, make a new adjustment, now at the "D" adjustment points. The two springs shoes must have the same adjustment.



POSITION "C"	1ST ADJUSTMENT OPTION.
POSITION "D"	2ND ADJUSTMENT OPTION.

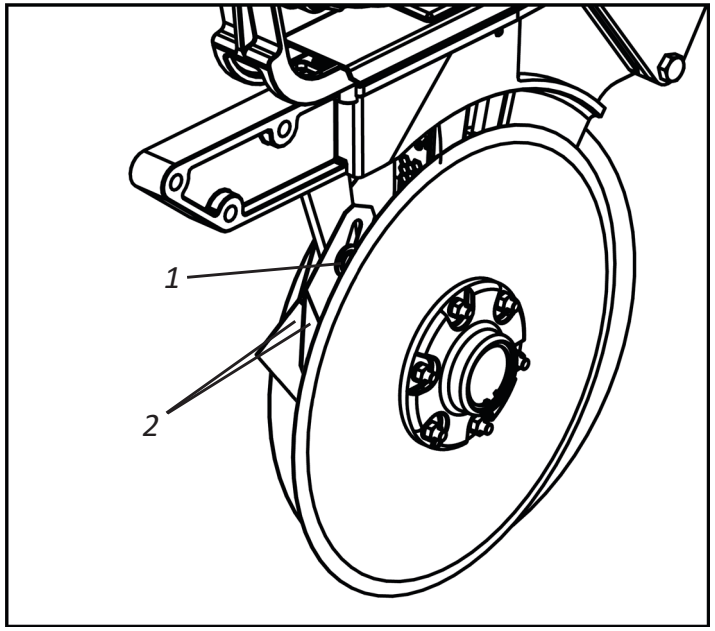
❗ IMPORTANT **Check the working depth of each line several times during planting, especially in terrains where there are variations in humidity, soil or other conditions.**

▪ Adjusting the lines

• Double disc cleaners adjustment

The double disc features flexible, adjustable wipers to remove dirt adhering to the discs. To adjust the wipers, proceed as follows:

01 - Loosen the screw (1), adjust the cleaners (2) in the ideal position and retighten the screw.



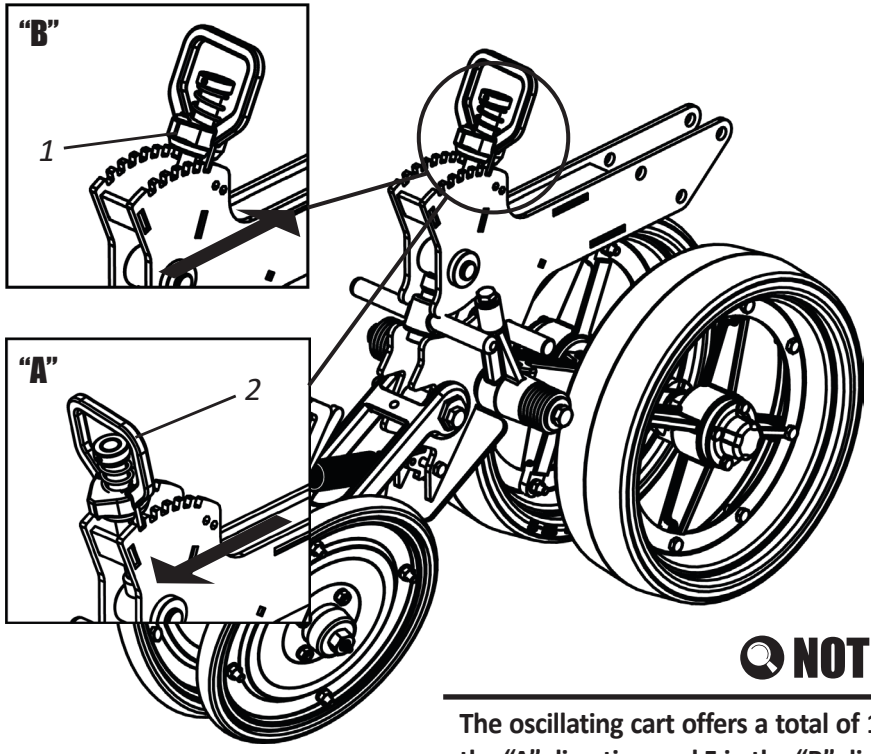
IMPORTANT

When finishing the adjustment, repeat the procedure on all lines, avoiding variation between them.

• Adjusting the oscillating depth wheel

The limiting wheels with oscillating depth, have a single support point that allows their oscillation, if an obstacle or irregularities appears in the ground in their path they will rise to overcome it, immediately returning to the initial position without lifting the double disc from its position. The seed depth is set individually by the depth limiting wheels. For this adjustment, proceed as follows:

01 - Pull the handle (1) up, move the regulator (2) to the desired point, adjusting the depth wheel (3), then lower the handle (1) locking the regulator (2).



NOTE

The oscillating cart offers a total of 11 adjustment points, 6 in the "A" direction and 5 in the "B" direction interspersed.

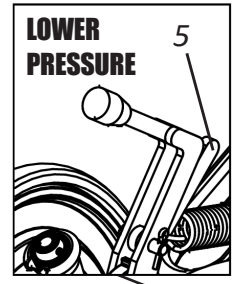
▪ Adjusting the lines

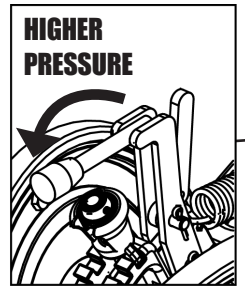
• Adjusting the "V" compactor wheel - Part I

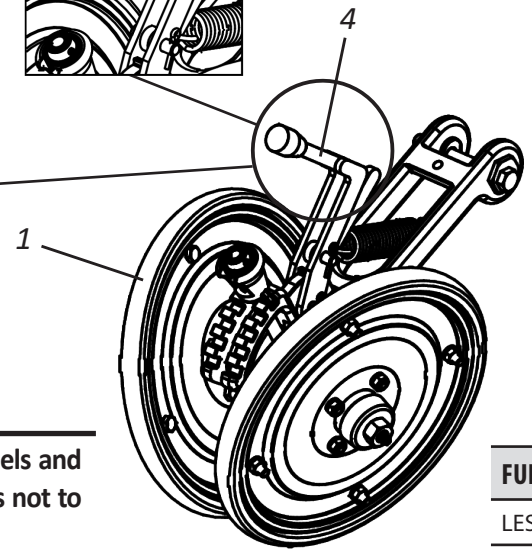
The "V" compacting wheels (1) are used to close the ridge laterally, causing the soil to be immediately placed over the seed, avoiding excess compaction and removing air pockets, facilitating germination and plant development. To adjust the greater or lesser angle of closing of the "V" compacting wheels (1), pull the handle (2) upwards, move the regulator (3) to the desired point, then lower the handle (2) locking the regulator (3). The "V" compacting wheels have 5 adjustment points.

HIGHER PRESSURE:	SHIFT THE HANDLE (2) BACK, GIVING MORE PRESSURE TO THE WHEEL (1).
LOWER PRESSURE:	SHIFT THE HANDLE (2) FORWARD, GIVING LESS PRESSURE TO THE WHEEL (1).

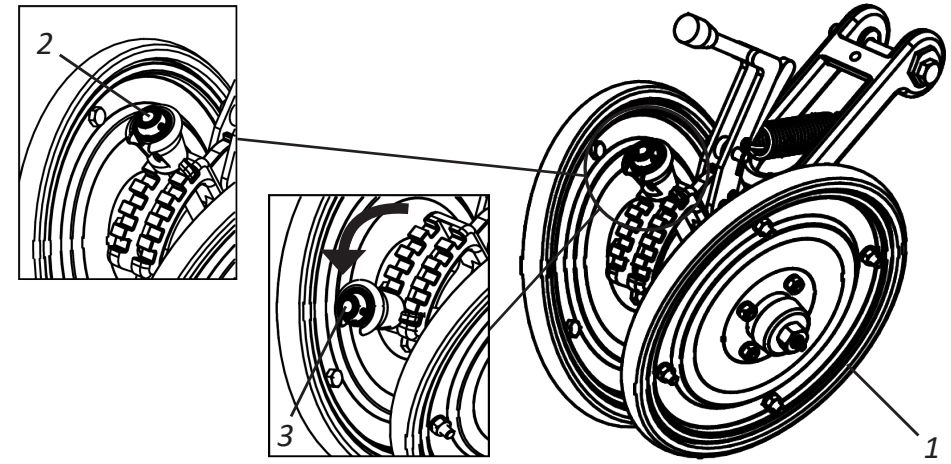
The "V" compactor wheel (1) can also be adjusted to its pressure using the lever (4), **as shown in the figure below.**



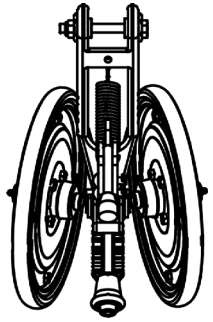


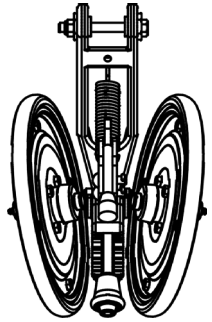


HIGHER PRESSURE:
SHIFT THE LEVER (4) BACK, GIVING MORE PRESSURE TO THE WHEEL (1).
LOWER PRESSURE:
TIGHTEN THE LEVER (5) SHIFT THE LEVER (4) FORWARD, GIVING LESS PRESSURE ON THE WHEEL (1).



ANGLE OF "V" WHEELS





FULLY CLOSED ANGLE POSITION	OPEN ANGLE POSITION
LESS EARTH OVER THE SEED.	MORE EARTH OVER THE SEED.

⚠ ATTENTION

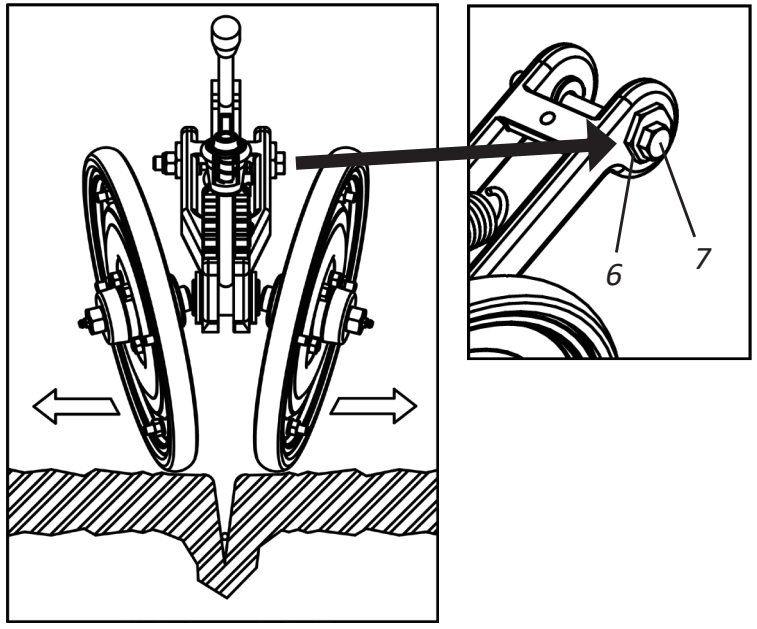
Make the same adjustment for all "V" compacting wheels and consider the type of soil, seed and planting depth, so as not to affect the free emergence of the plants.

▪ Adjusting the lines

• Adjusting the "V" compactor wheel Part II

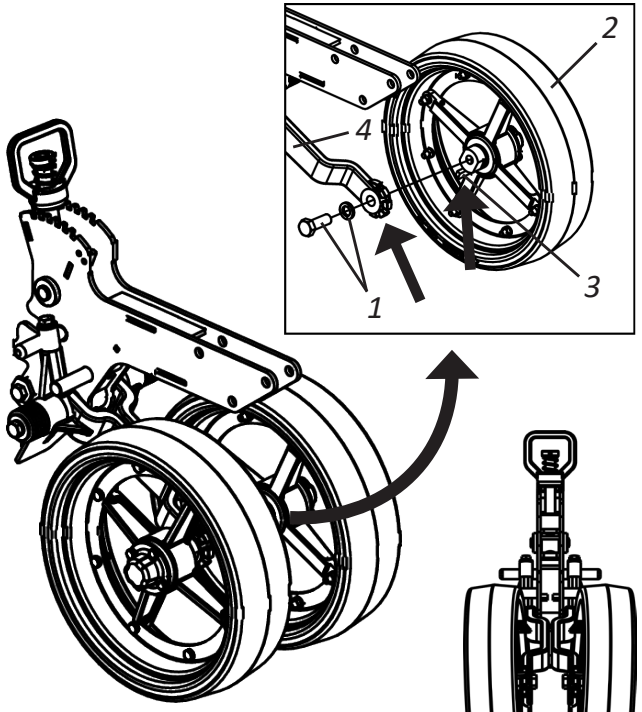
For horizontal displacement of the wheels, they were developed with eccentric bushings (5). For this adjustment, proceed as follows:

01 - Loosen the screws (7), rotate the said bushings (6), with a spanner to actuate the wheels and align them with the ridge, placing more or less soil on the side of the seed.



• Adjusting the oscillating depth wheel angle

The angle of the depth limiting wheels (1) has the purpose of pressing the ridge causing the soil to be immediately replaced on the seed, avoiding excessive compaction, facilitating the germination and development of the plant. To obtain the adjustments on the wheels, proceed as follows:



01 - Loosen the screws and washers (1), remove the wheel (2), adjust the wheel adjustment point (3) on the wheel support shaft adjustment (4), then secure the wheel (2) again with the washers and screws (1).

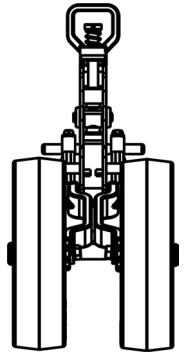
⚠ ATTENTION

Do the same procedure for the other wheel support (4) and for all wheels with oscillating depth.

WHEEL ANGLE

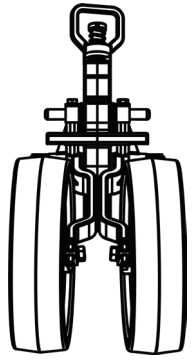
FULLY CLOSED ANGLE POSITION

LESS EARTH OVER THE SEED.



PARALLEL POSITION

FOR DEPTH CONTROL ONLY.



OPEN ANGLE POSITION

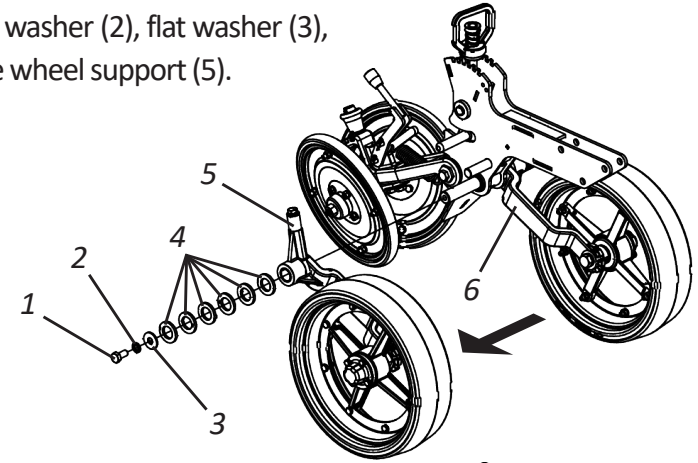
MORE EARTH OVER THE SEED.

▪ Adjusting the lines

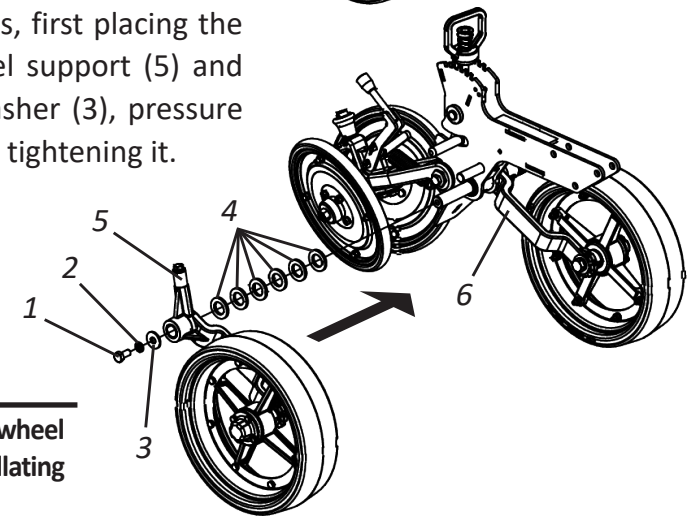
• Opening adjustment of the oscillating depth wheel

The oscillating depth wheels have an opening and closing system to better adapt to terrains with dense stubble or with higher and lower humidity. The oscillating depth wheels leave the factory in the closed position. To open the wheels with oscillating depth, proceed as follows:

01 - Loosen the screw (1), pressure washer (2), flat washer (3), remove the 6 shims (4) and the wheel support (5).

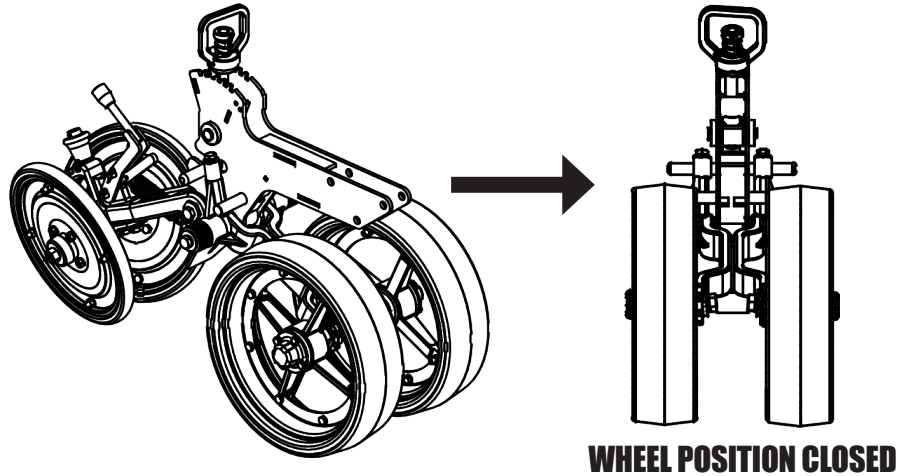


02 - Then, do the reverse process, first placing the 6 blocks (4), then the wheel support (5) and finish by placing the flat washer (3), pressure washer (2) and the screw (1) tightening it.

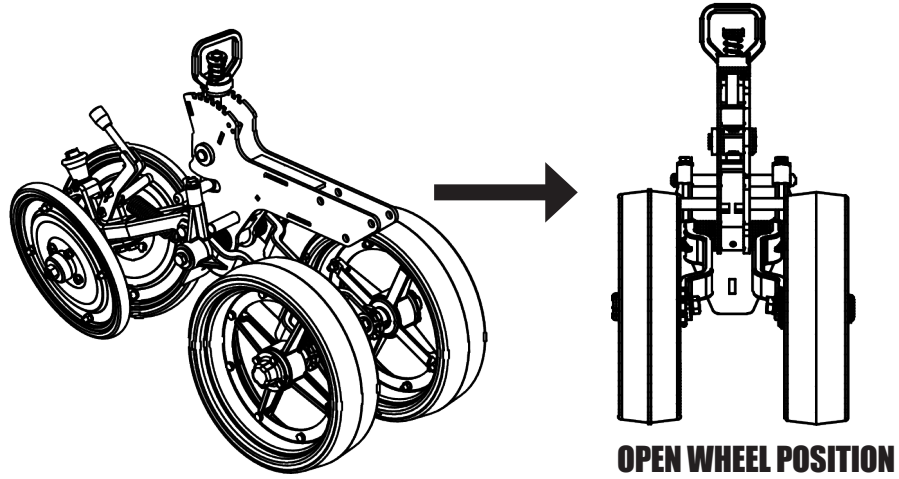


NOTE

Do the same procedure for the other wheel support (6) and for all wheels with oscillating depth.



WHEEL POSITION CLOSED



OPEN WHEEL POSITION

▪ Adjusting the lines

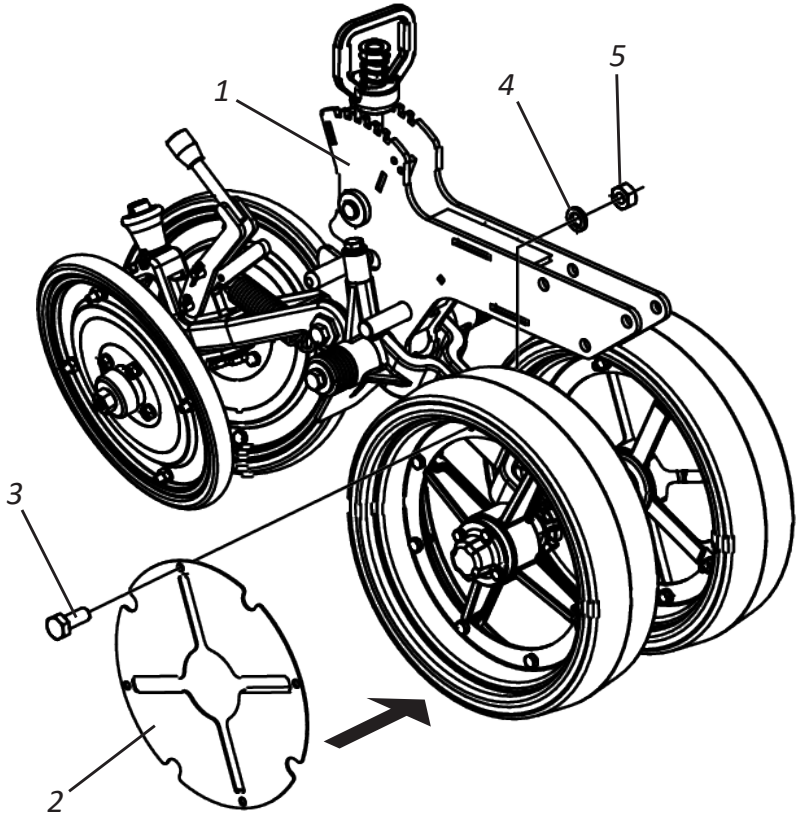
• Oscillating cart with protection ring (Optional)

The planting lines of the **TOPOGRAFIC AIR - BOSCH** seeder can be purchased with an oscillating cart with protective rim (1). The oscillating cart with protection ring was developed for situations of direct planting in which the corn cane was harvested in high cut, preventing it from entering the wheel rims during planting, locking it.

If you have purchased the **TOPOGRAFIC AIR - BOSCH** seeder, with the oscillating carts without protective rim, you can purchase only the protective rim (2) to fix it to the wheels. To install the protection ring (2), proceed as follows:

01 - Loosen the screws (3), lock washers (4) and nuts (5).

02 - Then, put the protection cover (2) fixing it through the screws (3), pressure washers (4) and nuts (5).

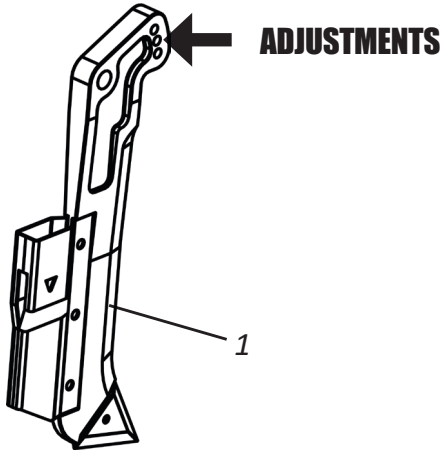


⚠ ATTENTION | **If you only buy the protection ring (2), secure it on all the oscillating carts (1) of the seeder.**

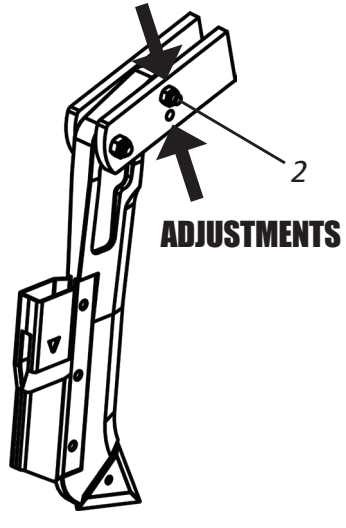
▪ Adjusting the lines

• Furrower attack angle adjustment (Optional)

The furrowers (1) have 3 options for adjusting the attack angle. To adjust the attack angle of the furrower, proceed as follows:



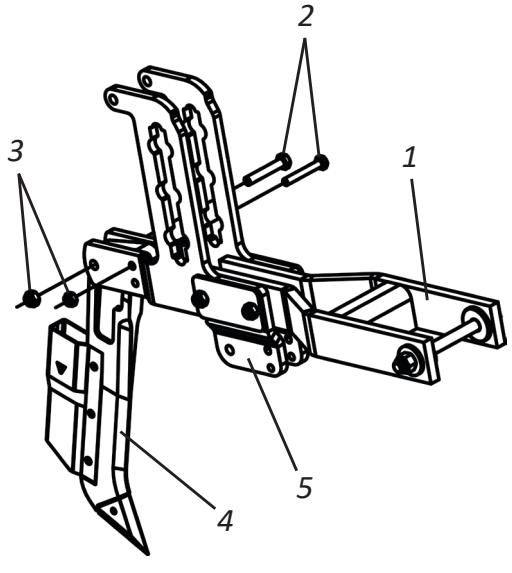
01 - Remove the screw (2), articulate the ridger (1) in the ideal setting and replace the screw (2).

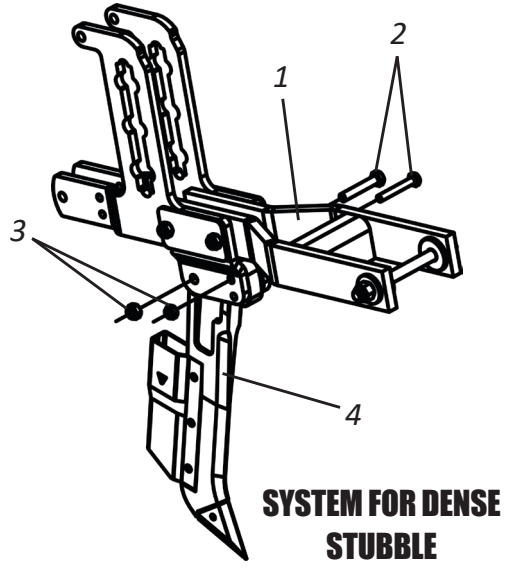


• Furrower adjustment for greater or lesser mismatch (Optional)

TOPOGRAFIC AIR - BOSCH can be purchased with a furrower with an offset system (1). This furrower is used in cases where the stubble is dense, increasing the mismatch of furrowers, providing greater flow. To adjust the furrower, proceed as follows:

01 - Loosen the screws (2) and nuts (3).
02 - Then remove the ridger (4) and place it on the front of the support (5).
03 - Then, secure it again with the screws (2) and nuts (3).

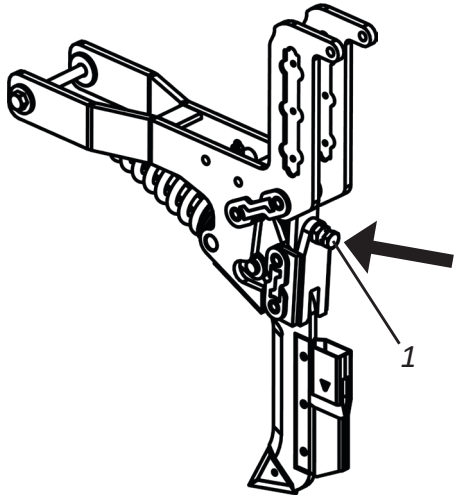




▪ Adjusting the lines

• Furrower adjustment for automatic disarm (Optional)

The furrower with automatic disarm has several working settings, to better adjust to the type of soil to be worked. To adjust the furrower trip sensitivity, proceed as follows:



FOR GREATER DISARM OF THE RIDGER:

01 - Tighten the screw (1) turning it clockwise.

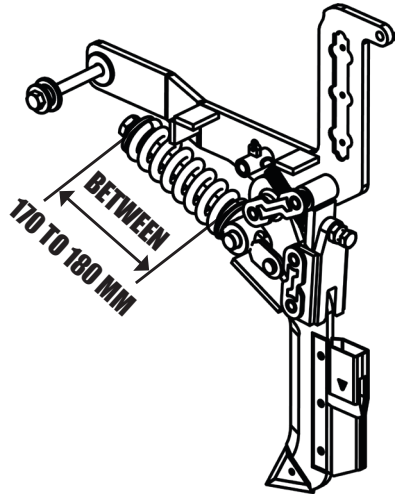
FOR MINOR TRIGGER OF THE RIDGER:

02 - Loosen the screw (1) by turning it counterclockwise.

⚠ ATTENTION | **This adjustment is minimal, that is, with a turn or less on the screw (1) the ideal adjustment.**

• Furrower reset load adjustment (Optional)

The furrower automatic reset system leaves the factory with the pre-load regulation in the determined spring that can vary between 170 to 180 mm in its length.



⚠ ATTENTION | **Do not make any other adjustments to the furrower spring. If you are constantly disarming, check the soil conditions, which can be very hard or have a high compaction rate.**

▪ Operations

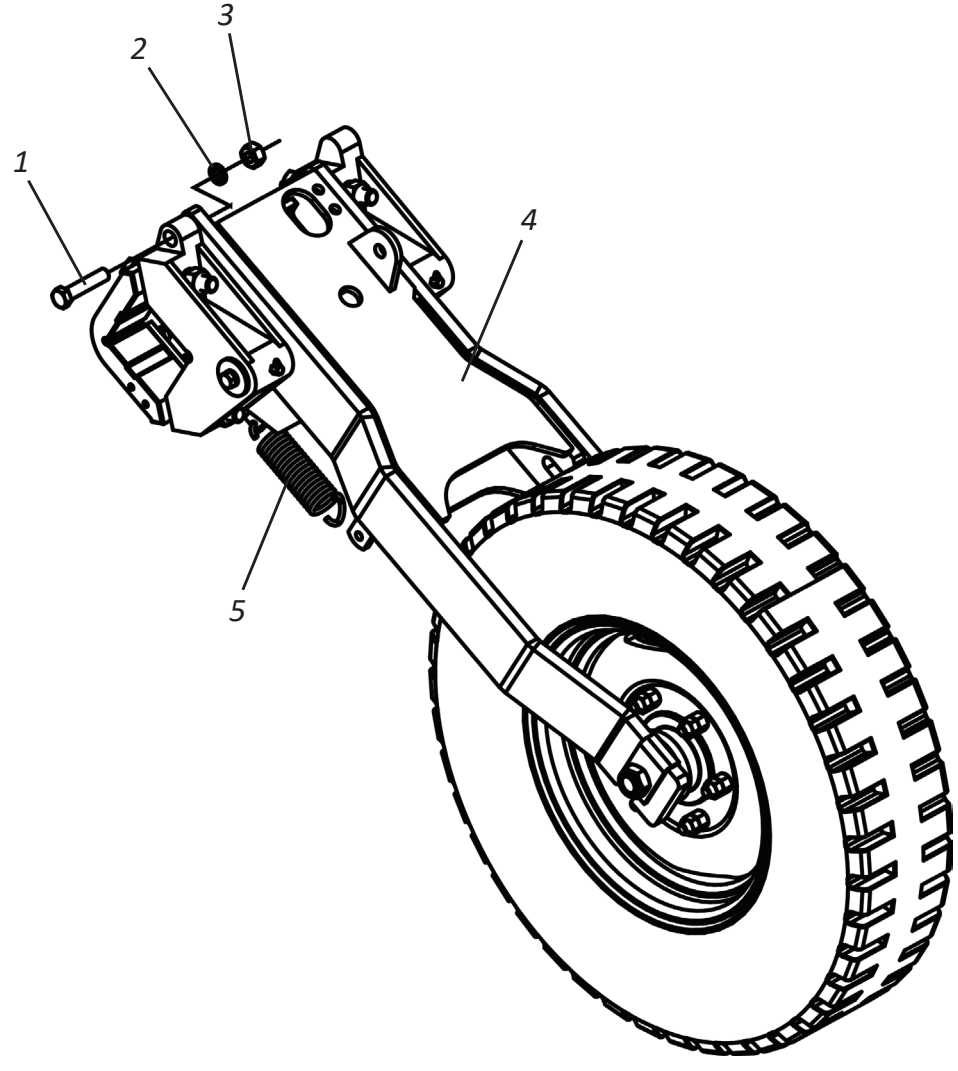
• Wheels mounting and articulating system

The system of fixing and articulation of the tires makes them free from the pressure of the pantographic system springs on the ground, thus allowing them to oscillate and follow the irregularities of the terrain, so that the distribution of fertilizer and seed is not interrupted.

01 - For conventional planting, lock the wheels with the screw (1), pressure washer (2) and nut (3).

02 - For no-till, the wheels operate freely and, if necessary, add 3/4” of water to the tires.

03 - The wheelset (4) is equipped with traction springs (5) for greater grip to the ground. Do not operate the seeder without it.



▪ Operations

• Operation recommendations

The preparation of the **TOPOGRAFIC AIR - BOSCH** and the tractor will allow you to save time in addition to a better result in the field work. The suggestions below may be helpful.

01 - After the first day of work with **TOPOGRAFIC AIR - BOSCH**, retighten all screws and nuts. Check the condition of the pins and locks.
02 - Do not maneuver or reverse with the lines lowered to the ground.
03 - Observe lubrication intervals.
04 - When filling the tanks make sure that there are no objects inside them, such as nuts, bolts, etc. Always use seeds free of impurities.
05 - Always observe the functioning of seed dispensing mechanisms and also the regulations established at the beginning of planting.
06 - Keep the **TOPOGRAFIC AIR - BOSCH** always level, the tractor's drawbar must remain fixed and the working speed must remain constant.
07 - Always check seed depth and press wheel pressure.
08 - Note the position of the fertilizer in relation to the seed in the soil.
09 - Do not make sharp turns with the **TOPOGRAFIC AIR - BOSCH** during work, especially in direct planting. Line components may be damaged.
10 - Do not partially activate the hydraulic cylinders. The drive for both lifting and lowering the **TOPOGRAFIC AIR - BOSCH** must always be complete.
11 - Do not disconnect any hose without first relieving circuit pressure. To do this, operate the control levers a few times with the engine off.
12 - After coupling and leveling, the next adjustments will be made directly in the work field, analyzing the terrain in its texture, humidity and the types of operations to be carried out with the **TOPOGRAFIC AIR - BOSCH.**
13 - Observe the working and transport speeds specified on page 14. We do not recommend exceeding speeds in order to maintain the efficiency of the service and avoid possible damage to the **TOPOGRAFIC AIR - BOSCH.**
14 - When carrying out any checks or maintenance on the **TOPOGRAFIC AIR - BOSCH**, lower it to the ground and turn off the tractor engine.
15 - **TOPOGRAFIC AIR - BOSCH** has several adjustments, but only local conditions can determine the best adjustment.
16 - The right and left side indications are made observing the **TOPOGRAFIC AIR - BOSCH** from behind.
17 - Refuel the **TOPOGRAFIC AIR - BOSCH** only at the job site.
18 - Do not transport or work with excessive load on the **TOPOGRAFIC AIR - BOSCH**.
19 - **TOPOGRAFIC AIR - BOSCH** operates more efficiently in the range of 5 to 6 km/h.

In case of doubt, never operate or handle the TOPOGRAFIC AIR - BOSCH, consult the After-Sales.
Telephone: 0800-152577 / Email: posvenda@baldan.com.br

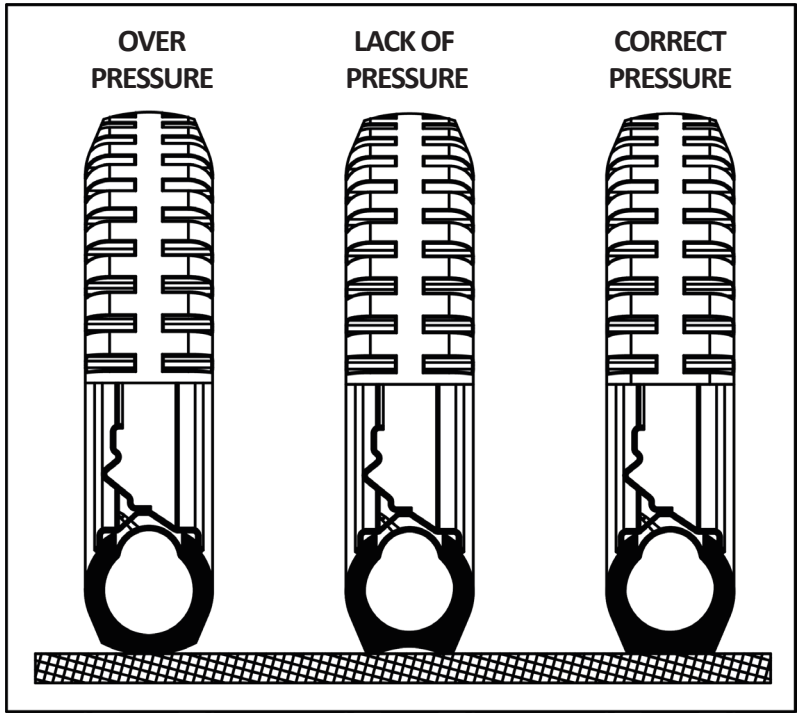
▪ Maintenance

TOPOGRAFIC AIR - BOSCH was developed to provide you with maximum performance on terrain conditions. Experience has shown that periodic maintenance of certain parts of the **TOPOGRAFIC AIR - BOSCH** is the best way to help you not have problems, so we suggest checking.

• Tire pressure

The tires must always be correctly calibrated, avoiding premature wear due to excess or lack of pressure and ensuring precision in dispensing.

TIRES 700 X 16 10 PLIES



USE: 70 LBS/POL²

⚠ ATTENTION

Never weld the tire mounted wheel, the heat can cause the air pressure to build up and cause the tire to explode.

When inflating the tire, position yourself beside the tire, never in front of it.

To inflate the tire, always use a containment device (inflation cage). Mount the tires with suitable equipment. The service must be carried out only by persons qualified for the work.

❗ IMPORTANT

When calibrating the tires, do not exceed the recommended calibration.

🔍 NOTE

The pressure of the tractor tires should be made according to the manufacturer's recommendations.

▪ Maintenance

• Lubrication

Lubrication is essential for a good performance and greater durability of the moving parts of the **TOPOGRAFIC AIR - BOSCH**, contributing to savings in maintenance costs.

Before starting the operation, carefully lubricate all grease fittings, always observing the lubrication intervals on the next page. Make sure of the quality of the lubricant, its efficiency and purity, avoiding the use of products contaminated by water, soil and other agents.

• Table of greases and equivalents

Manufacturer	Type of recommended grease
Petrobrás	Lubrax GMA-2
Atlantic	Litholine MP 2
Ipiranga	Ipiflex 2
Castrol	LM 2
Mobil	Grease MP
Texaco	Marfak 2
Shell	Alvania EP 2
Esso	Multi H
Bardahl	Maxlub APG-2EP
Valvoline	Palladium MP-2
Petronas	Tutela Jota MP 2 EP
	Tutela Alfa 2K
	Tutela KP 2K

⚠ ATTENTION

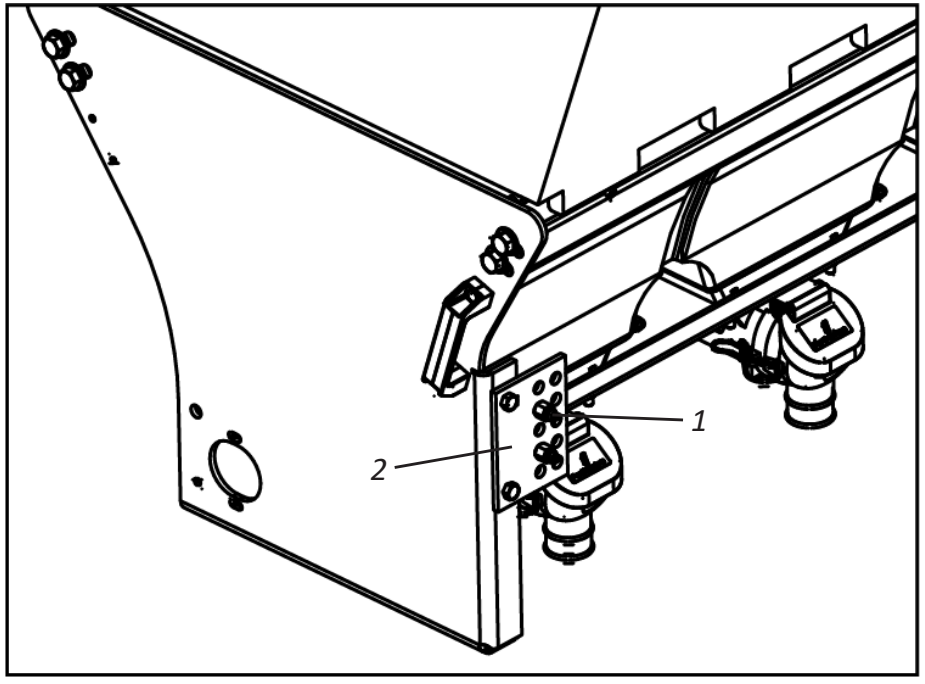
If there are manufacturers and/or equivalent brands that are not listed in the table, consult the manufacturer's technical manual.

• Centralized lubrication system

TOPOGRAFIC AIR - BOSCH has a centralized lubrication system that makes maintenance faster and easier, allowing to lubricate all lateral and central points of the machine without having to remove the protections. To lubricate, proceed as follows:

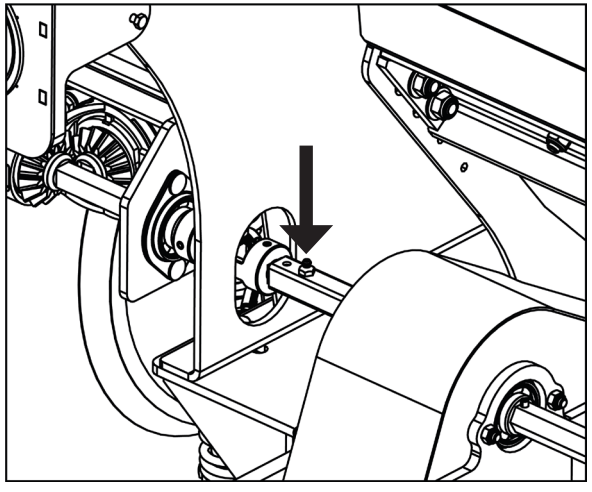
01 - Before starting lubrication, clean all grease fittings (1) with a lint-free cloth and replace damaged ones.

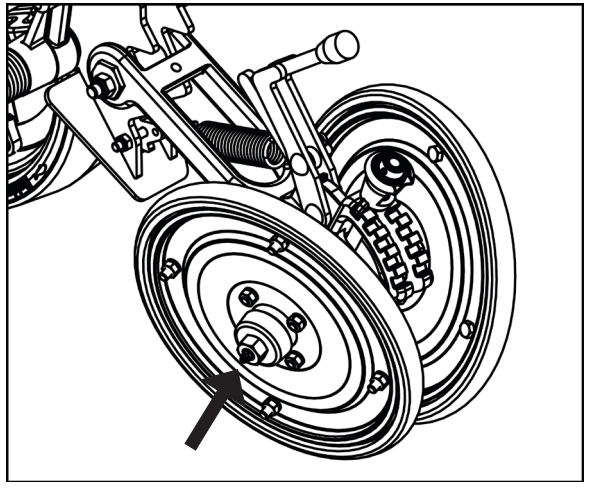
02 - Lubricate all grease fittings (1) of the centralized system (2) every 10 hours of work.

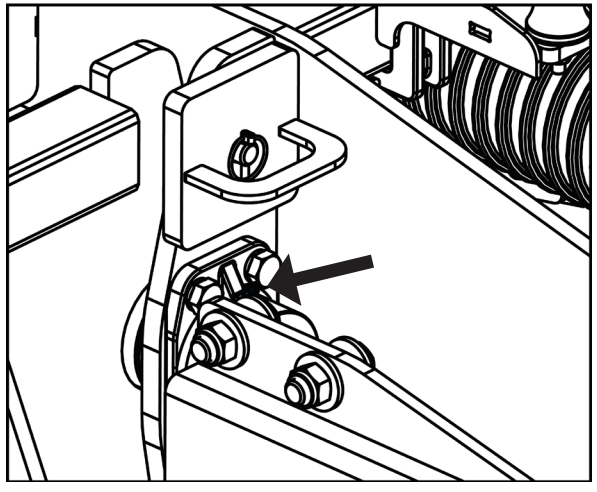


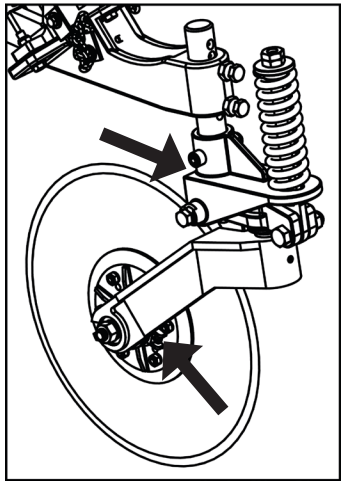
▪ Maintenance

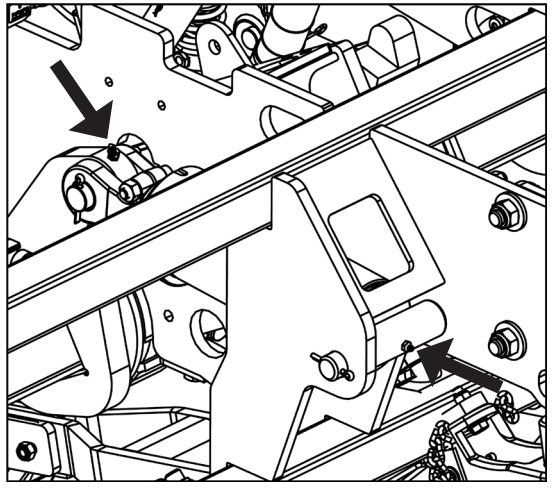
- Lubrication every 10 hours of work

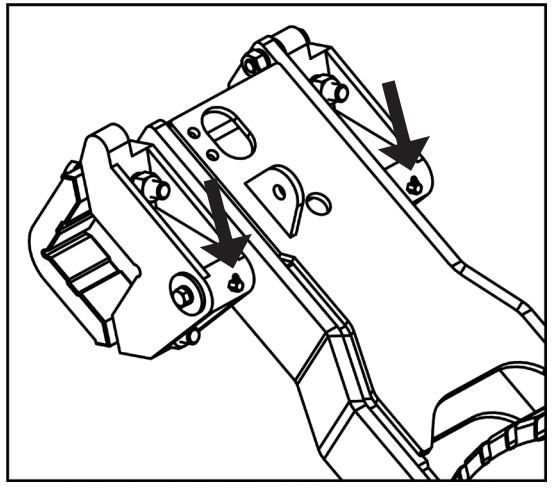










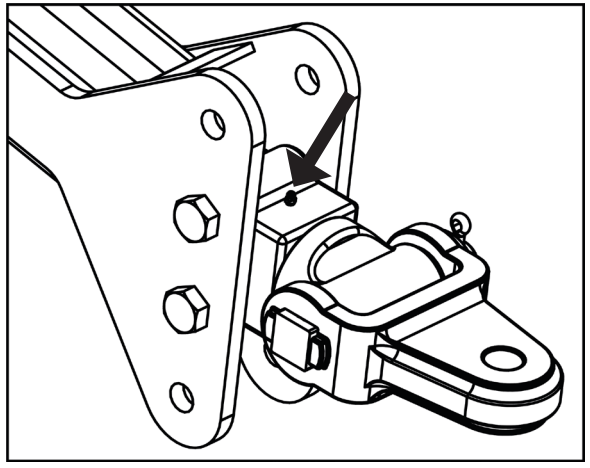


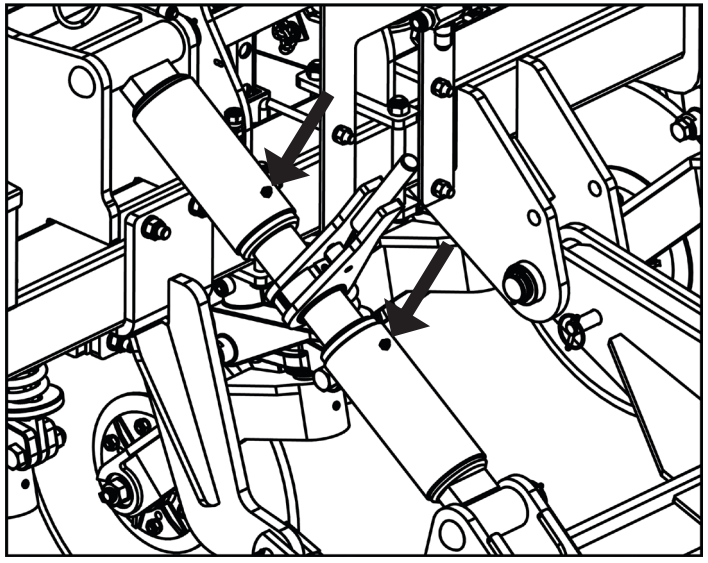
⚠ ATTENTION

When lubricating the TOPOGRAFIC AIR - BOSCH, do not exceed the amount of new grease. Introduce a sufficient amount.

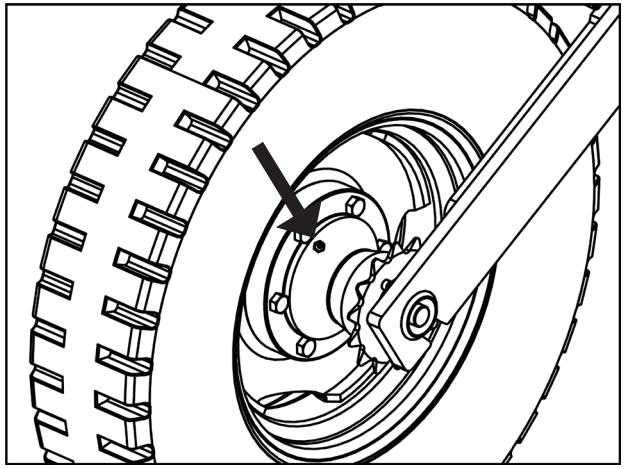
▪ Maintenance

• Lubrication every 30 hours of work





• Lubrication every 60 hours of work



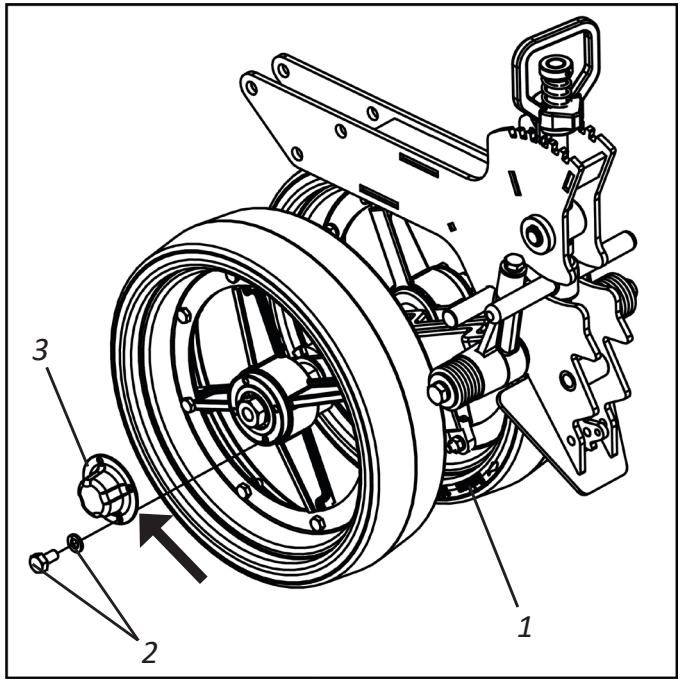
⚠ ATTENTION

When lubricating the TOPOGRAFIC AIR - BOSCH, do not exceed the amount of new grease. Introduce a sufficient amount.

▪ Maintenance

• Lubrication every 200 hours of work

To lubricate the compacting wheels (1), loosen the screws and washers (2), remove the cap (3) and add new grease. Replace the hub (3) on the compactor wheels (1) and secure it with the screws and washers (2).



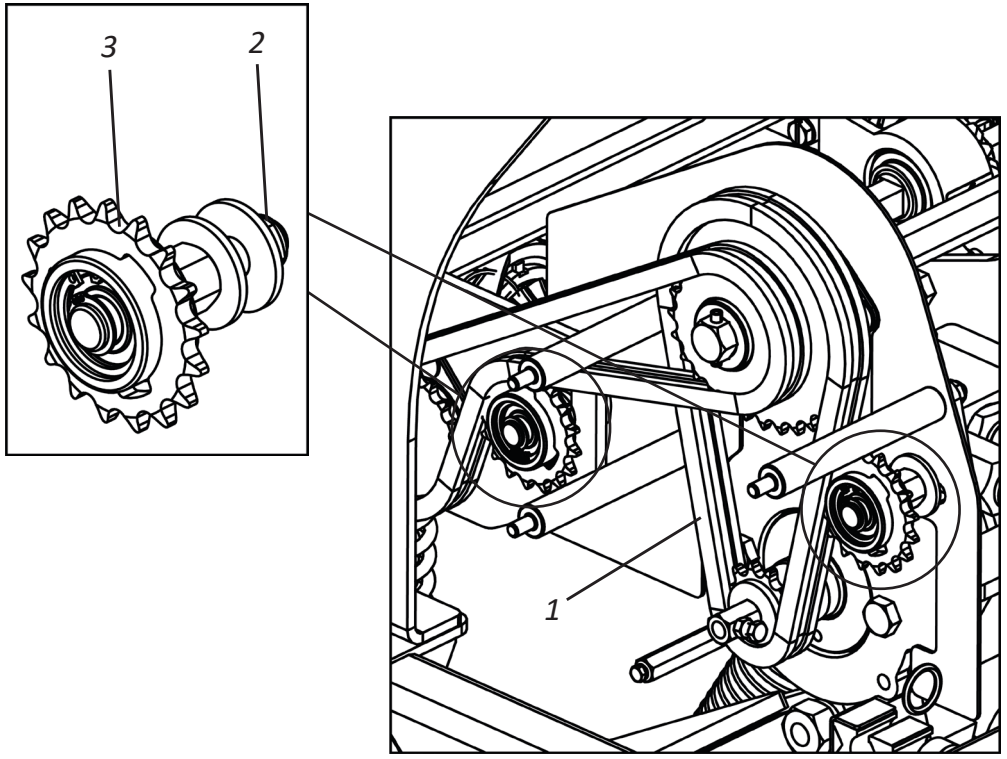
⚠ ATTENTION | **When lubricating the TOPOGRAFIC AIR - BOSCH, do not exceed the amount of new grease. Introduce a sufficient amount.**

❗ IMPORTANT | **Before opening the hub (8), clean its external surfaces.**

• Chain tension

To tension the chain (1), proceed as follows:

01 - Loosen the nut (2), slide the tensioner (3) adjusting the chain tension (1).
02 - Then, retighten the nut (2).



⚠ ATTENTION | **Check chain tension daily, normal clearance should be + - 1 cm in the center of the chains.**

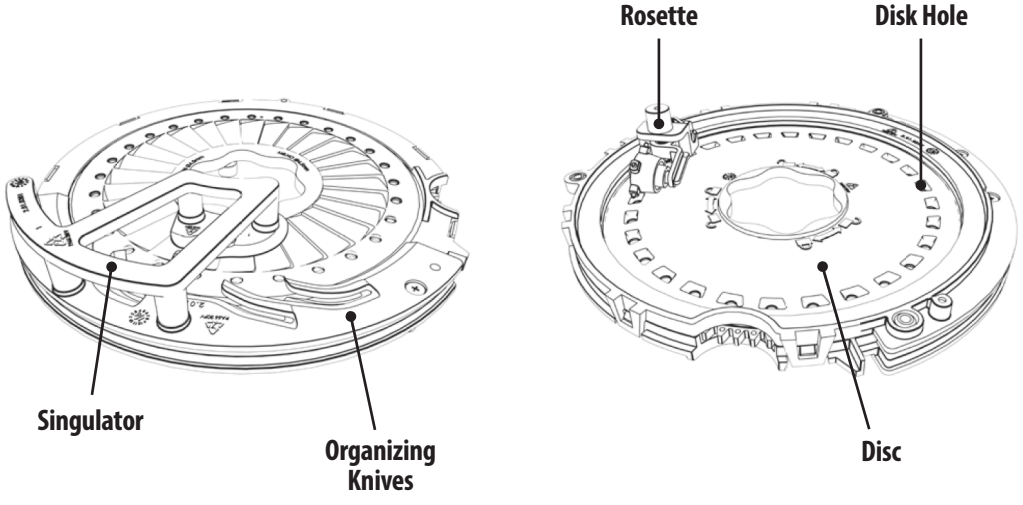
▪ Maintenance

• Preventive maintenance on the SELENIUM batcher before planting - Part I

Perform preventive maintenance on the **SELENIUM** batcher before planting as instructed below:

1 - DISK, ORGANIZER AND ROSETTE SET

01 - Check the disc, organizer and rosette set. Replace the assembly when there is excessive wear on any of the following parts:

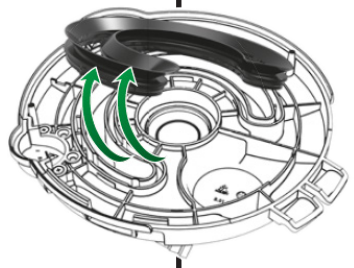


2 - SEAL

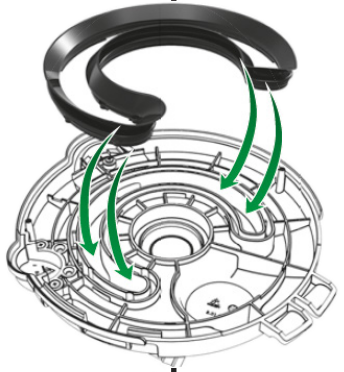
Check for excessive wear, cracks or holes in the vacuum seal. If you have any of the items mentioned, replace the seal.

PASSO A PASSO
PARA SUSBSTITUIÇÃO DA VEDAÇÃO

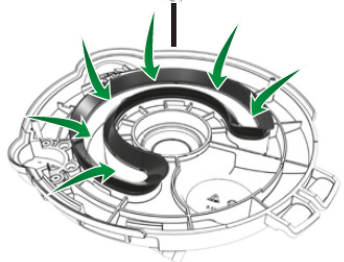
01 - Remove the sealing rubber from the batcher cover, pulling **it upwards.**



02 - Firstly, assemble the **ends** of the new seal on the metering cover.



03 - Fit **all the rubber on the batcher** cover,pressing **it down.**



▪ Maintenance

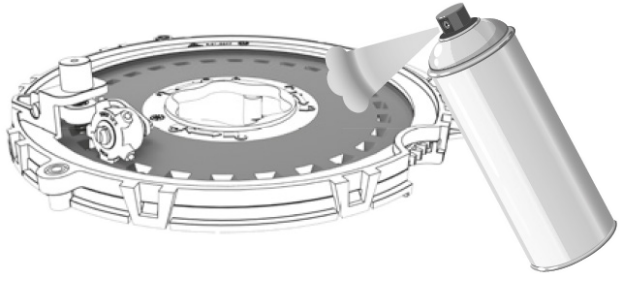
• Preventive maintenance on the SELENIUM batcher before planting - Part II

3 - GRAPHITE POWDER IN THE BATCHER

Make sure **the batcher is well lubricated with powdered graphite before each planting**, if not, apply powdered graphite to the batcher **before filling it with seed**.

4 - GRAPHITE ON DISC

Check if the graphite on the back of the disc (rosette side) is worn and, if so, apply **J.Assy Graphite Lubricant Spray** to the entire surface of the disc.

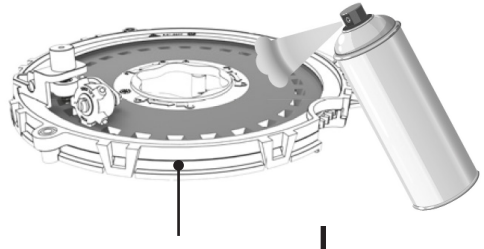


IMPORTANT:

To maintain the life of the seal, always keep the back side of the disc well graphited.

STEP BY STEP FOR APPLYING GRAPHITE ON DISC

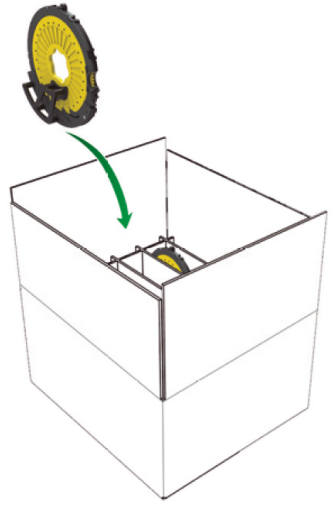
Position **the disc assembly horizontally**, then apply **J.Assy Graphite Lubricant Spray all over the disc.** Wait for it to dry (disassembly of the disc array is not required). See next.



Position the set horizontally

5 - STORAGE

When not in use, store the disc set in its original box for your protection.



6 - CLEANING

In case of accumulation of residues and dust in the batcher, clean it to ensure the correct functioning of the product.

▪ Maintenance

• Operational maintenance - Part I

PROBLEMS	PROBABEL CAUSE	SOLUTIONS
During planting, fertilizer starts to leak through the safety exits.	Clogged hoses or pieces of plastic in the conductive fertilizer coils.	Unclog the hose or remove the upper channel that gives access to the spiral, rotate the shaft in the opposite direction until the foreign body that is stuck loosens.
Fertilizer hub shaft does not rotate.	Spiral blocked by wet fertilizer or excess fertilizer in the closed line.	Unclog the spirals, check if you have a loose gutter and the fertilizer may be entering by their sides.
One planting line is less shallow than the other.	Different pressure settings on the depth limiting wheels or line springs.	Adjust all wheels of equal depth and the pressure of the line springs.
The ridge is too open during planting.	Sticky soil that sticks to the discs or excessive work speed.	Decreases work speed.
Strange noise when operating or moving with a loaded seeder.	Loose wheels or wheel hub.	Re-tighten the wheel nuts. Adjust the wheel hub bearings.
The seeder leaves the planting line or on one side, sometimes on the other side in width.	Tractor drawbar loose.	Use the pin that comes with the seeder. Secure the tractor drawbar in the center hole.
It is not covering the ridge.	Poorly adjusted covering wheels or damp grounds.	Adjust the covering wheel by moving it sideways in relation to the ridge.
The hydraulic cylinders stop operating, raise the seeder and then do not lower or vice versa.	Different quick coupling, ball-type male and needle-type female or vice versa.	Proceed by changing the quick coupler, placing two of the same type.
Broken seeds.	High planting speed.	Decrease work speed.
	Inadequate disc thickness.	Use suitable disc (hole thickness and diameter).
	Using moist seeds.	Using dry seeds.
Quick hitch does not fit.	Couplings of different types.	Exchange them for males and females of the same type.

▪ Maintenance

• Operational maintenance - Part II

PROBLEMS	PROBABEL CAUSE	SOLUTIONS
Damaged tires.	Work area with stones, stumps, or crop remains with stems that causes cuts to the tires.	Eliminate the elements that cause damage to the tires before the period of use of the TOPOGRAFIC AIR - BOSCH.
	Tires are not under the proper pressure causing deformation.	Maintain proper tire pressure.
Strange noise on wheels.	Loose wheels or wheel set.	Retighten wheel nuts and adjust wheel hub bearings.
	Bearings breakage.	Identify the occurrence and replace the damaged parts.
Leakage in hydraulic hoses.	Sealing material on the screw thread is missing.	Use thread sealant tape and retighten carefully.
	Insufficient tightening.	Retighten carefully.
	Repairs damaged.	Replace terminals.
Leak in quick couplers.	Insufficient tightening.	Retighten carefully without excess.
	Repairs damaged.	Replace repairs.
Quick couplings do not couple.	Couplings of different brands.	Use quick couplers of the same brand.
	Mixture of needle-type couplings with ball-type couplings.	Always use quick couplers of the same type.
	Pressure on the system.	Relieve pressure to couple.

⚠ ATTENTION | **For the BOSCH system, see the table (FAILURE/ERROR, CAUSE and SOLUTIONS) on pages 159 to 163.**

▪ Maintenance

• Fertisystem batcher accessories

The Fertisystem batcher is fitted with a “cross-lid” level regulator and endless spring (step 2 “).



“CROSS-LID” LEVEL REGULATOR

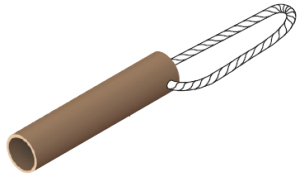


ENDLESS SPRING (STEP 2”)

The Fertisystem batcher comes with the accessories: maintenance tube, fixing tube and blocking tube.



MAINTENANCE TUBE



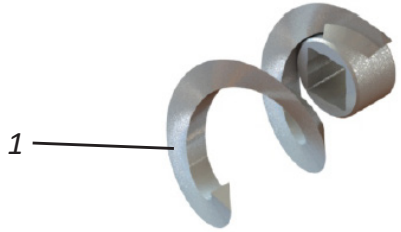
FIXING TUBE



BLOCKING TUBE

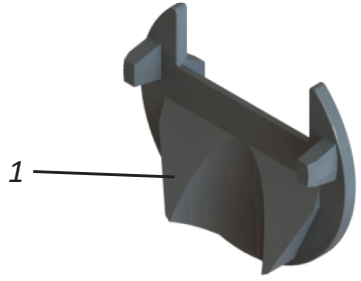
• Endless spring

At **TOPOGRAFIC AIR - BOSCH**, the Fertisystem metering unit leaves the factory assembled with a 2” pitch worm spring (1).



• “Cross-Lid” level regulator

The Fertisystem batcher leaves the factory fitted with the “Cross-Lid” level regulator (1). The uniformity and precision in the distribution is due to the level regulator “Cross-Lid” (1), which has the function of canceling the pulsating effect of the endless spring cycle and also controlling the dosage.



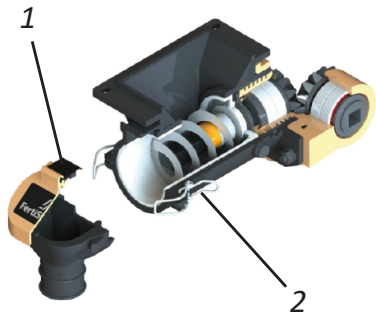
⚠ ATTENTION | **Never operate without the “Cross-Lid” level regulator (1). Check that it is well positioned in the nozzle.**

▪ Maintenance

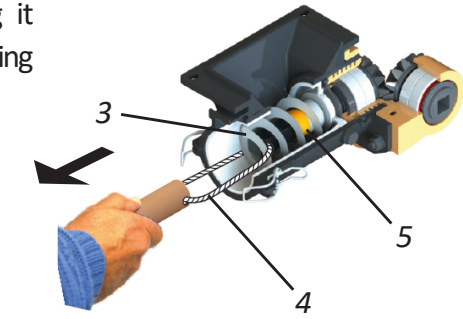
• Maintenance or replacement of the Fertisystem dosing spring

After planting, do not leave fertilizer in the tank. To perform maintenance or exchange of the endless spring or to perform cleaning or any repair on the inside of the Fertisystem batcher, proceed as follows:

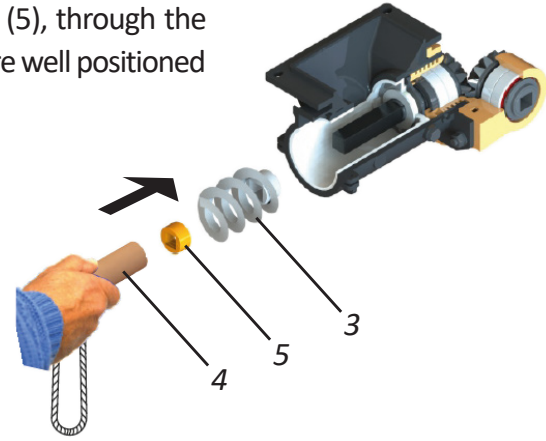
01 - Disengage the nozzle (1) through the stainless steel lock (2).

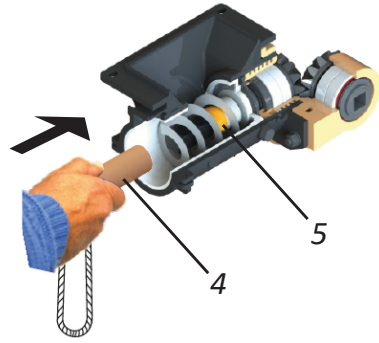


02 - Then, remove the endless spring (3), pulling it through the cord of the fixing tube (4), also removing the locking ring (5).



03 - After cleaning, replace the endless spring (3), together with the locking ring (5), through the fixing tube (4), making sure that the endless spring (3) and the locking ring (5) are well positioned at the base of the shaft (6).



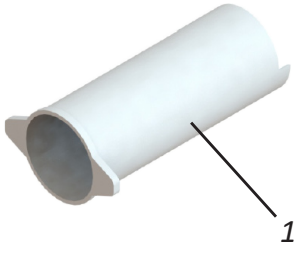


⚠ ATTENTION **Keep the worm spring in place with the locking ring. This procedure will avoid damaging the cross cover when not using the seeder with the fertilizer or when transporting the seeder. In case of wear or lack of tightening “pressure” of the lock ring (5), replace it.**

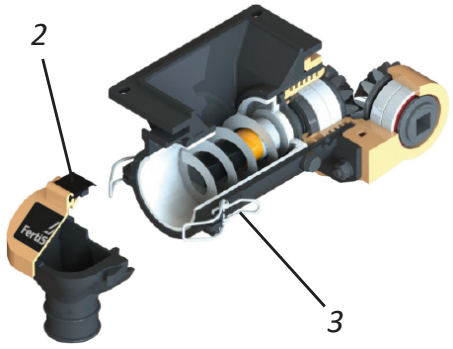
▪ Maintenance

• Fertisystem batcher maintenance tube

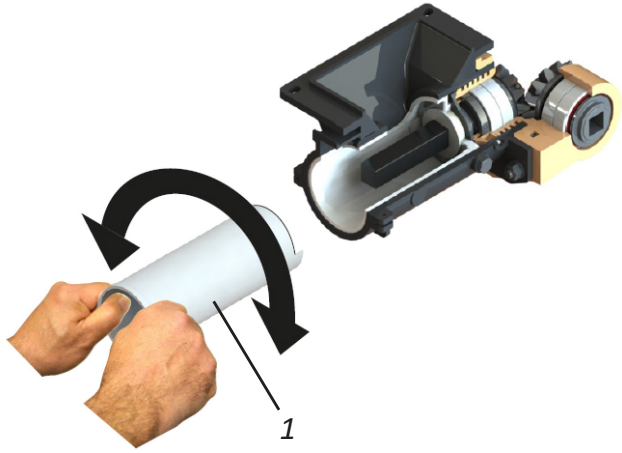
To maintain or change the endless springs in the Fertisystem batcher without the need to remove the fertilizer from the tank, use the maintenance tube (1), to do this, proceed as follows:



01 - Disengage the nozzle (2) through the stainless steel lock (3).



02 - Then, introduce the maintenance tube (1) in rotating movements, promoting the displacement of the fertilizer to the bottom of the batcher. Then perform the necessary maintenance.

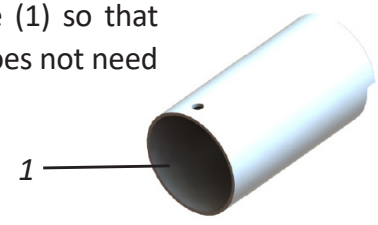


NOTE | **The maintenance tube (1) has an end cut angle to facilitate this operation.**

▪ Maintenance

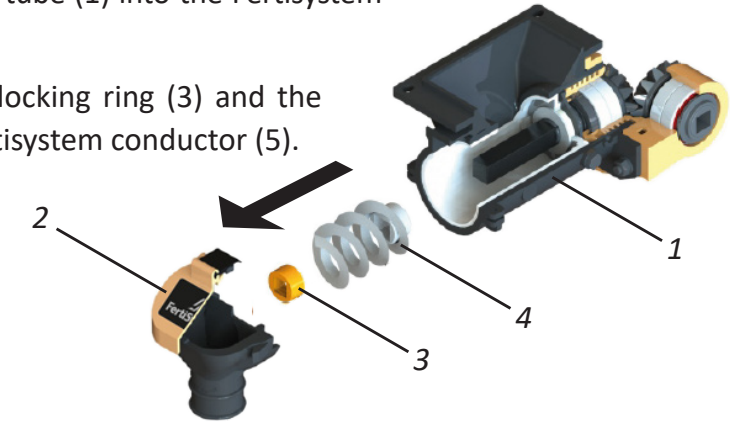
• Fertisystem Batcher Blocker Tube

TOPOGRAFIC AIR - BOSCH comes with a blocking tube (1) so that when you need to isolate some planting lines, the fertilizer does not need to be distributed.

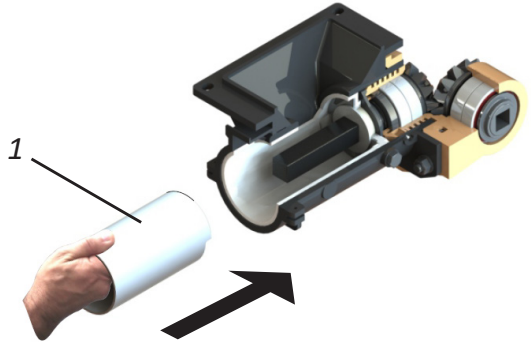


In order to place the blocking tube (1) into the Fertisystem batcher, proceed as follows:

01 - Remove the nozzle (2), the locking ring (3) and the worm spring (4) from the fertisystem conductor (5).



02 - Then insert the locking tube (1).



03 - Then, replace the nozzle (2).



• Spring and cap (optional) - Fertisystem batcher

The **TOPOGRAFIC AIR - BOSCH** leaves the factory with 2” pitch worm spring and transverse cover **(standard)**, however, optionally, the seeder can be supplied with 1” pitch worm spring and high-flow cover.



ENDLESS SPRING (STEP 1”)



HIGH FLOW COVER

NOTE

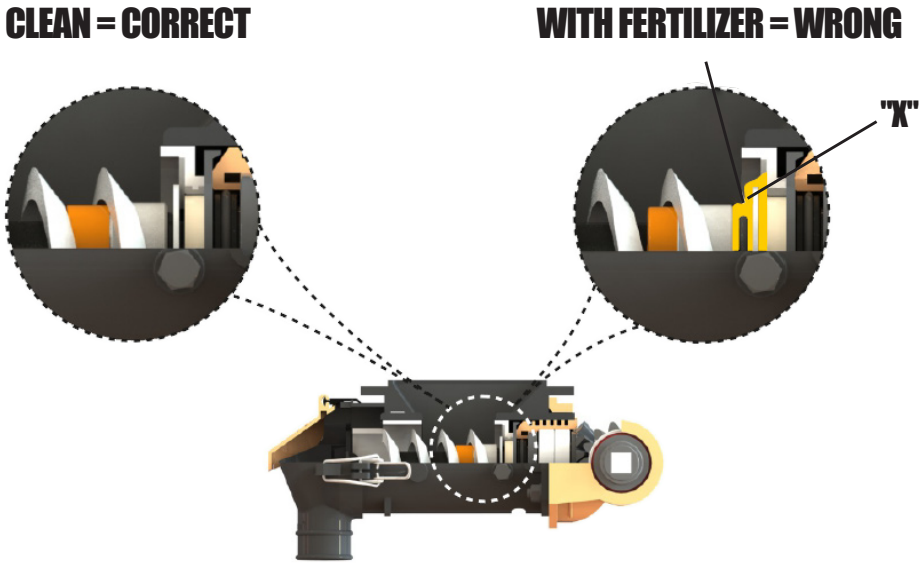
Always fill the fertilizer tank at the work location.
Avoid any kind of impurity in the fertilizer tank.
Carry out a measurement of dosage daily.

▪ Maintenance

• Cleaning the Fertisystem batcher

We consider it mandatory to clean parts and components of the Fertisystem batcher that maintain direct and indirect contact with fertilizers, since they are highly corrosive and abrasive, and can promote oxidation and destructible chemical reactions, through the effects of acidity, salinization and others, chemical fertilizers.

After planting is complete, disconnect the nozzle (1), the endless springs (2) and wash the sets thoroughly, keeping them free of fertilizers until new use, making the assemblies correctly.



⚠ ATTENTION

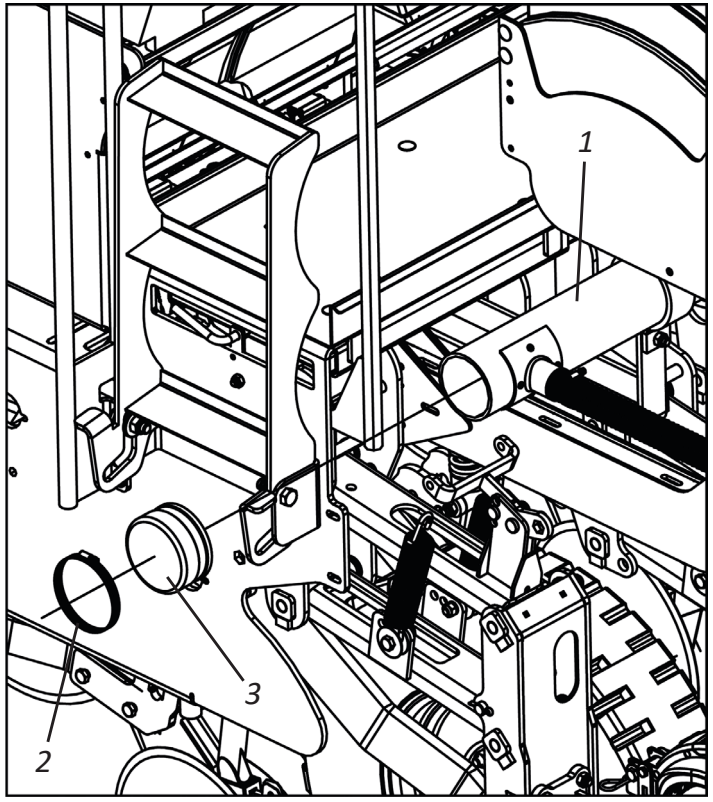
Make sure that there is no fertilizer in the "X" area between the washers and the sealing felt.
In case of extreme need to use the fertilizer out of specification and/or with excess moisture, perform daily cleaning of the endless springs and other components. Do not carry out maintenance or cleaning in the bearing area, worm springs and gears while the seeder is in motion.

▪ Maintenance

• Cleaning the air tube

At the end of each season, we recommend cleaning the air tube (1) to remove the lodged graphite. To clean the air tube (1), proceed as follows:

01 **-** Release the clips (2) and remove the covers (3) on both sides of the air tube (1).
02 **-** Then, activate the turbine for 30 seconds to clean the air tube (1).
03 **-** Then, replace the covers (3) locking them through the clips (2).



⚠ ATTENTION



Before turning on the turbine, make sure that there are no people near the air tube outlets (1), because when turning the turbine on, residues of toxic products used in seed treatment will be expelled, so DO NOT be exposed to the air that will come out. of the air tube (1). In case of intoxication due to inhalation or aspiration, keep the victim in a place with fresh air and seek a physician immediately, taking with you the chemical product label or packaging.

⚠ **POISONING SYMPTOMS: Weakness, headache, chest pressure, blurred vision, non-reactive pupils, excess of salivation, perspiration, nausea, vomiting and abdominal cramps.**

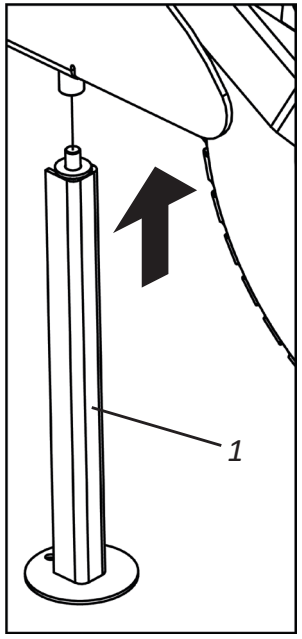
Do not work with the TOPOGRAFIC AIR - BOSCH without first placing the caps (3) and clips (2) on the air tube (1).

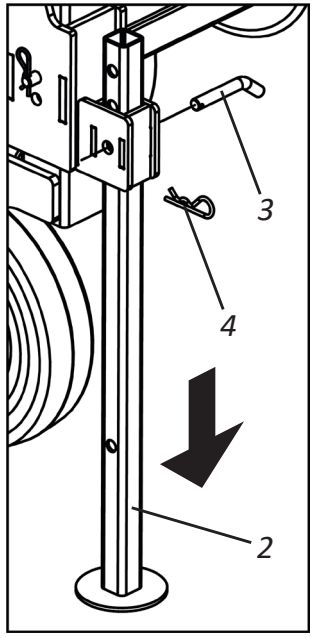
▪ Maintenance

• Changing tires

If necessary, change or repair the tires for this, proceed as follows:

01 - Firstly, support the **TOPOGRAFIC AIR - BOSCH** at the rear through the support (1) so that it is stabilized.



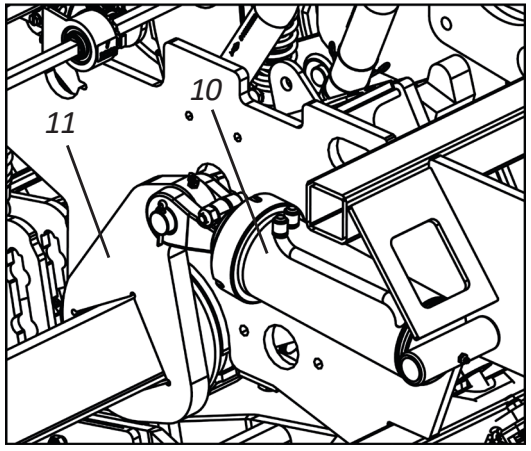


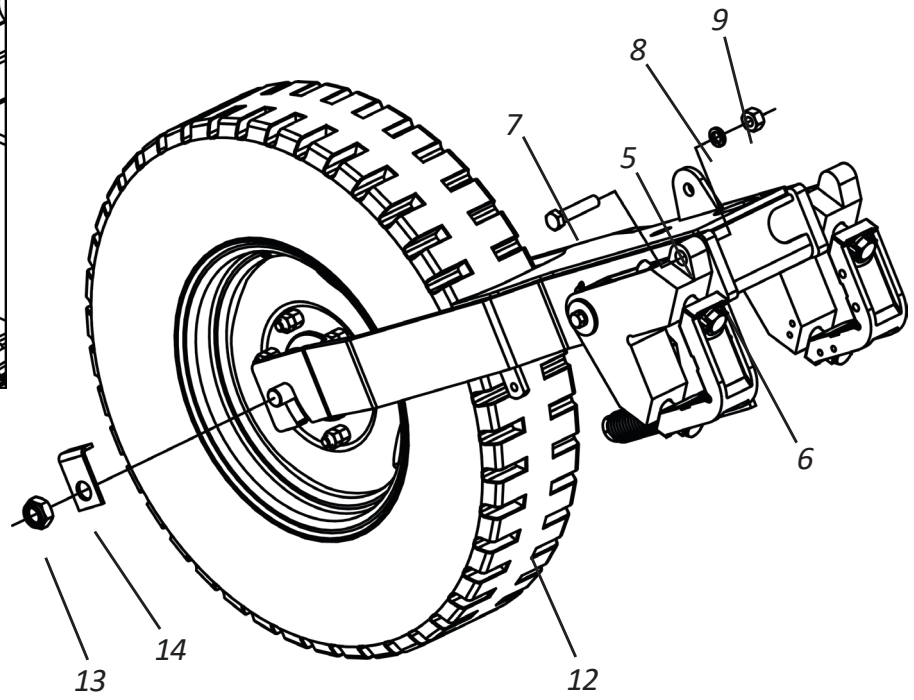
02 - Then, lower the support brackets (2) on the front of the seeder and fix them with the pin (3) and lock (4).

03 - Then, lock the clamp (5) in the wheel support (6) through the screws (7), pressure washer (8) and nut (9).

04 - Then, fully retract the hydraulic cylinder (10) from the central axle (11) to suspend the tire (12) from the ground.

05 - Finally, loosen the nuts (13) and the locks (14) to remove the tire (12).





⚠ ATTENTION

At the end of changing the tire, remove the screw (6), lock washer (7) and nut (8) unlocking the clamp (4) of the wheel support (5). Do not work with the seeder without first removing them. Ignoring this warning will cause planting failures.

❗ IMPORTANT

Before changing or repairing the tire, make sure that the TOPOGRAFIC AIR - BOSCH is properly supported. Failure to do so can cause damage, serious accidents or even death.

▪ Maintenance

• Cautions

01 - Before each work, check the condition of all hoses, pins, screws and discs. When necessary, retighten or replace them.
02 - Travel speed must be carefully controlled according to terrain conditions.
03 - **TOPOGRAFIC AIR - BOSCH** is used in several applications, demanding knowledge and attention during its handling.
04 - Only local conditions will be able to determine the best form to operate the **TOPOGRAFIC AIR - BOSCH**.
05 - When assembling or disassembling any part of the **TOPOGRAFIC AIR - BOSCH**, use suitable methods and tools.
06 - Carefully observe the lubrication intervals at the various **TOPOGRAFIC AIR** - **BOSCH** lubrication points. Observe the lubrication intervals.
07 - Always check if the parts are worn. If replacement is required, always demand genuine Baldan parts.
08 - Keep **TOPOGRAFIC AIR - BOSCH** tires always calibrated.
09 - Keep **TOPOGRAFIC AIR - BOSCH** blades always sharp.

IMPORTANT | **Proper and periodic maintenance is necessary to guarantee the long life of the TOPOGRAFIC AIR - BOSCH.**

• Care during planting

01 - The fertilizer has great power to absorb moisture and this accelerates the oxidation process, therefore, avoid spillage and accumulation of fertilizer during the supply of **TOPOGRAFIC AIR - BOSCH.**
02 - Use a blower, compressed air or broom to remove excess fertilizers from the seeder at the end of the day.
03 - To avoid the effects of the fertilizer, protect the **TOPOGRAFIC AIR - BOSCH** by storing it in the shed or covering it with canvas (as best as possible) during the rain and/or at night, to protect it from moisture.

▪ Maintenance

• General cleaning

01 - When storing the **TOPOGRAFIC AIR - BOSCH**, do a general cleaning and wash it completely with water only. Check that the paint has not worn out, if this has happened, apply a general coat, apply the protective oil and fully lubricate the **TOPOGRAFIC AIR - BOSCH**. Do not use burnt oil or other abrasive.

02 - At the end of planting, proceed as follows:

- Remove the transmission chains and keep them bathed in oil until the next planting.
- Remove the hoses by immediately washing them with mild soap and water. Do not use other chemicals.
- Remove the regulator and articulate the header upwards, locking it.

03 - Fully lubricate the **TOPOGRAFIC AIR - BOSCH**. Check all the moving parts of the **TOPOGRAFIC AIR - BOSCH**, if they appear to be worn out or loose, make the necessary adjustment or replace the parts, leaving the seeder ready for the next job.

04 - After all maintenance work, store the seeder in a covered, dry place, properly supported.

Avoid: - That the discs are directly in contact with the ground.
- That the hydraulic hoses are properly capped.

05 - When connecting or disconnecting hydraulic hoses, do not let their ends touch the ground. Before connecting the hydraulic hoses, clean the connections with a clean, lint-free cloth. **Do not use tow!**

06 - Replace all damaged or missing stickers, especially warnings. Make everyone aware of their importance and the dangers of accidents when instructions are not followed.

07 - After all maintenance care, store your **TOPOGRAFIC AIR - BOSCH** on a flat surface, covered and dry, away from animals and children.

08 - Make sure that the deposits are properly covered.

09 - We recommend washing the **TOPOGRAFIC AIR - BOSCH** only with water at the beginning of the work.

⚠ ATTENTION | **Do not use chemical or abrasive products to wash the TOPOGRAFIC AIR - BOSCH, as this could damage the paintwork and adhesives.**

▪ Maintenance

• Seeder conservation - Part I

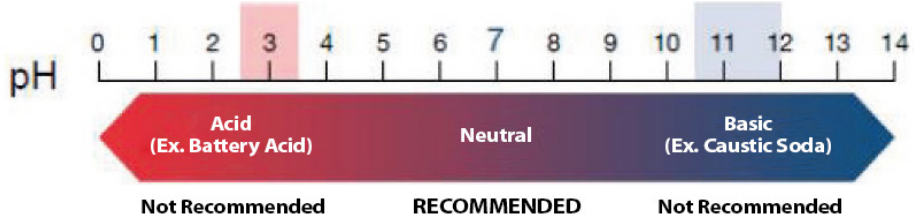
To prolong the life and appearance of the **TOPOGRAFIC AIR - BOSCH** longer, follow the instructions below:

01 - Fertilizers and their additives are highly corrosive and their formulation is increasingly aggressive to the seeder components.
02 - Wash and clean all the seeder components during and at the end of the work season.
03 - Use neutral products to clean the seeder, following the safety and handling guidelines provided by the manufacturer.
04 - Always perform maintenance at the times indicated in this manual.

• Seeder conservation - Part II

The practices and care below, if adopted by the owner or operator, make a difference for the conservation of **TOPOGRAFIC AIR - BOSCH.**

01 - Be careful when washing with high pressure; do not direct the water jet directly on connectors and electrical components. Isolate all electrical components;
02 - Use only water and NEUTRAL detergent (pH equal to 7);
03 - Apply the product, strictly following the manufacturer's instructions, on the wet surface and in the correct sequence, respecting the application and washing time;
04 - Stains and dirt not removed with the products must be removed with the aid of a sponge.
05 - Rinse the machine with clean water to remove all chemical residues.
06 - Do not use: - Detergents with basic active principle (pH greater than 7), they can damage/stain the seeder paint.
- Detergents with acid active principle (pH less than 7) act as a paint remover/zinc plating (the protection of parts against oxidation).



▪ Maintenance

• Seeder conservation - Part III

07 - Let the machine dry in the shade so that water does not accumulate in its components. Drying too quickly can cause stains on your paint.

08 - After drying, lubricate all chains and grease fittings according to the recommendations in the operator's manual.

09 - Spray the entire machine, especially the zinc-coated parts, with protective oil, following the manufacturer's application guidelines. The protector also prevents the adherence of dirt in the machine, facilitating subsequent washing.

10 - Observe the curing time (absorption) and application intervals as recommended by the manufacturer.

⚠ ATTENTION

Do not use any other oil to protect the seeder (used hydraulic oil, "burnt" oil, diesel oil, castor oil, kerosene, etc.).

❗ IMPORTANT

We recommend the following protective oils:
- Bardahl: Protective Agro 200 or 300
- ITWChemical: Zoxol DW - Series 4000

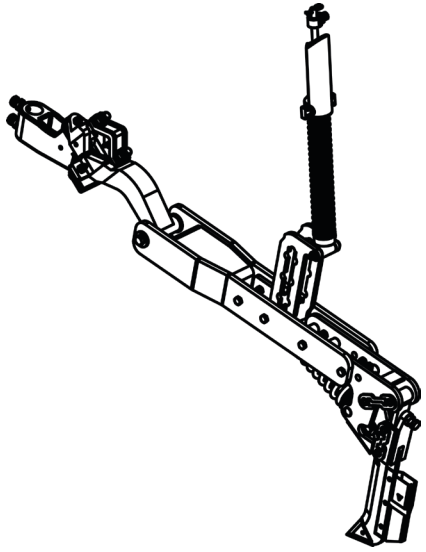
🔍 NOTE

Ignoring the conservation measures mentioned above may result in the loss of the warranty for painted or zinc-coated components that present possible oxidation (rust).

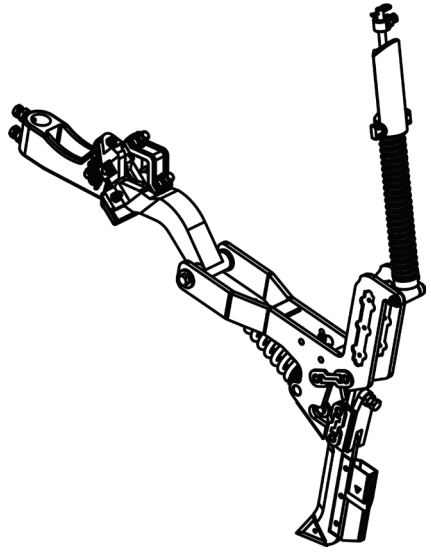
▪ Optional

• Optional accessories - Part I

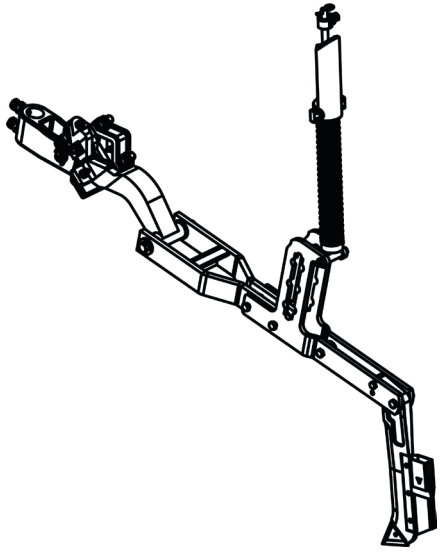
TOPOGRAFIC AIR - BOSCH has options that can be purchased according to the need for work.



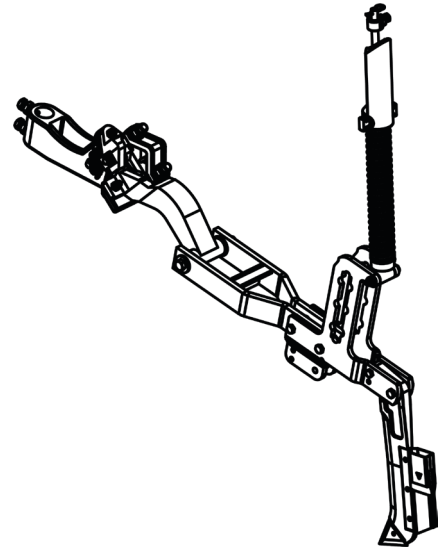
FERTILIZER CART WITH LARGER TRIPPING/RESETTING RIDGER WITH SUPPORT FOR CUTTING DISC



FERTILIZER CART WITH SMALL RESET/ RESET FURROWER WITH CUTTING DISC SUPPORT



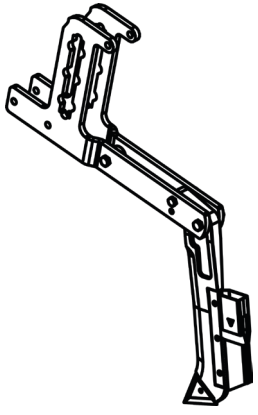
FERTILIZER CART WITH LARGER RIDGER WITH CUTTING DISC SUPPORT



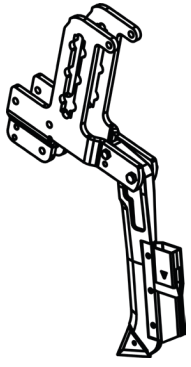
FERTILIZER CART WITH SMALLER RIDGER WITH CUTTING DISC SUPPORT

Optional

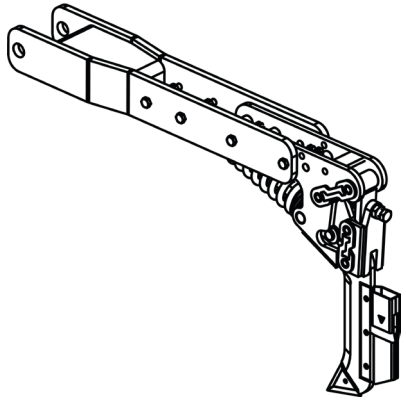
• Optional accessories - Part II



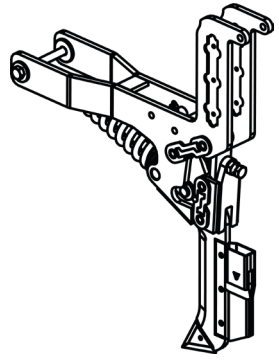
COMPLETE LARGER FERTILIZER RIDGER



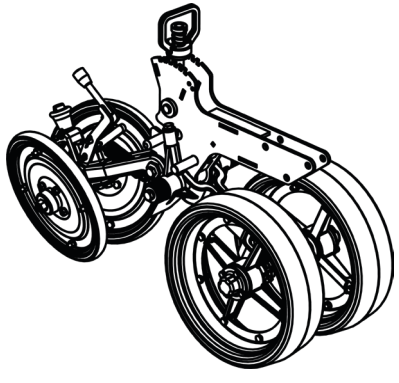
COMPLETE SMALLER FERTILIZER



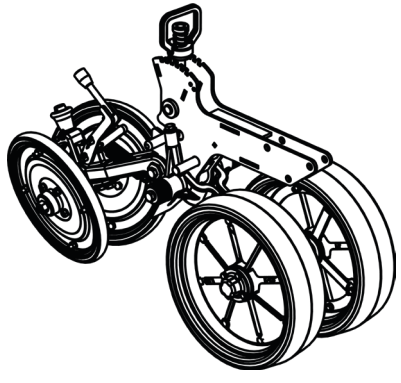
BIGGER RIDGER WITH AUTOMATIC RESET/RESET HEIGHT 540 MM



SMALLER RIDGER AUTOMATIC TRIPPING/RESETTING



CART WITH EXCENTRIC/OSCILLATING DEPTH WHEEL AND "V" WHEEL WITHOUT PROTECTION RING



CART WITH EXCENTRIC/OSCILLATING DEPTH WHEEL AND "V" WHEEL WITH PROTECTION RING

▪ BOSCH operation manual

• BOSCH System

The **BOSCH** system consists of a precise control system for seed and fertilizer distribution, optimizing the sowing implement.

The main function of the system is to optimize seed and fertilizer deposition by controlling the speed of the metering unit of each seed line and fertilizer section of the seeder. Based on the motors rotation signal, it creates a real-time closed-loop control to compensate for speed, direction and curves ensuring the field is seeded and fertilized at the prescribed rate and the best seed-to-seed distance. Allows the use of prescription maps and providing indicators and alarms about the status of planting.

• Powerbox

PowerBox is a system developed by Bosch to supply and store electricity for E-Motors in the IPS system. The main function of the system is to convert the tractor's hydraulic energy into electrical energy, for this it is necessary that the tractor supplies a constant flow of oil of 20 liters/minute with a maximum pressure of 250 bar, in order to generate an electric current of up to 80 A and voltage of 24 V, in order to distribute the generated power between the IPS components.

The PowerBox contains moving electrical and mechanical parts, so it is extremely important **not to open the box during operation.**

The component contains locks that can be secured with padlocks to prevent opening of the enclosure during operation and access of components by unauthorized persons. During operation, at least one or more of the locks must be locked with a padlock (padlocks not provided).



▪ BOSCH operation manual

• Operating Instructions - Part I

⚠ ATTENTION The operating instructions provide the basis for the safe use and operation of the BOSCH IPS system. These operating instructions, and in particular the enclosed safety instructions, must be observed by all persons working with the BOSCH IPS system. In addition, all rules and regulations concerning accident prevention that apply in the specific region (or place of operation) in which the BOSCH IPS system is used must be observed.

⚠ THIS SYMBOL INDICATES A HAZARDOUS SITUATION IN WHICH THE USER MUST PROCEED.
READ THE OPERATING INSTRUCTIONS CAREFULLY BEFORE USING THE BOSCH IPS SYSTEM.

⚠ Handle agricultural chemicals safely. Chemicals used in agricultural applications such as fungicides, herbicides, insecticides, pesticides, rodenticides and fertilizers can be harmful to your health or the environment if not used carefully. Always follow label instructions for effective, safe and legal use of agricultural chemicals.

⚠ Keep moving axes distance. Winding on rotating shafts and cardans can cause serious injury or death. Keep transmission guards in place at all times. Wear appropriate tight clothing. Shut off engines, ensure that the system is not running, and that the engines are stopped before any adjustments or cleaning of any equipment driven by the IPS system is made.

⚠ When moving the seeder, make sure that there are no people, animals or property within the range of movement.

⚠ Make sure there is no oil flow before connecting or disconnecting the hydraulic hoses. Failure to check before connecting or disconnecting hoses to the VCR could result in personal injury or equipment damage.

⚠ Avoid possible physical injury. Disconnect the ground (-) cable from the battery before any electrical repairs. Do not modify, add or replace PowerBox components with non-genuine items.

⚠ Maximum pressure 250 bar. Connect the drain daily to the free return on the tractor. See tractor manual. Does no t connect drain to motor return. Risk of component damage.When turning off the PowerBox engine use the VCR float function.

⚠ Safe maintenance practice:

- Understand the maintenance procedure before performing any work. Keep the work area clean and dry.
- Never lubricate, adjust or service the machine while it is in motion. Keep hands, feet and clothing away from electrically or hydraulically powered parts. Disengage all power sources, and operate controls to relieve pressure.
- Lower the equipment to the ground. Shut down the engine. Remove the key. Allow the machine to cool down.

▪ BOSCH operation manual

• Operating Instructions - Part II

- Securely support any machine elements that have to be lifted so that maintenance can be carried out.
- Keep all parts in good condition and properly installed. Repair damage immediately. Replace worn or broken parts. Remove any accumulations of grease, oil or debris.
- Disconnect the battery ground cable (-) before making any adjustments to electrical systems or before welding on the machine.
- Disconnect the connecting cable set from the tractor and all seeder modules before servicing electrical system components or before welding on the machine.

SAFETY AND CAUTION NOTES

⚠ Maximum pressure 250 bar.

⚠ Connect the drain directly to the tractor tank return. See tractor manual.

⚠ Do not connect the drain to the hydraulic motor return. Permanent damage to the component.

⚠ Disconnect the connecting cable assembly from the tractor and all seeder modules before servicing electrical system components or before welding on the machine.

⚠ Avoid overheating areas beside pressurized fluid lines.

⚠ Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to you and others. Do not perform electrical welding or torching near pressurized fluid lines or other flammable materials.

⚠ Pressurized lines can accidentally explode when heat extends beyond the area near the flame/arc.

▪ BOSCH operation manual

• Operating Instructions - Part III

SYSTEM OPERATION

⚠ When the “Fill Disk” function is activated, the motors will be operational. Take all necessary precautions to ensure user safety. Failure to comply could result in serious injury or death.

⚠ When the “Test Engines” function is activated, the engines will be operational. Take all necessary precautions to ensure user safety. Failure to comply could result in serious injury or death.

⚠ When the tractor is moving and the implement is off, the system is fully operational. Take all necessary precautions to ensure user safety. Failure to do so could result in injury or death.

⚠ Do not handle the measuring unit motors/coupling while the system is operational. Risk of entanglement. Take all necessary precautions to ensure user safety. Failure to comply could result in serious injury or death.

POWERBOX

⚠ Do not open the PowerBox case during operation! Use of non-original (eg open) PowerBox may lead to physical injury.

⚠ When turning off the PowerBox engine, use the VCR’s float function.

⚠ Do not modify, add or replace PowerBox components with non-original items

⚠ Do not use the PowerBox to power any other third party hardware.

⚠ Handling the battery incorrectly can cause a fire. Changing the battery during PowerBox operation is not allowed!

ELECTRIC MOTOR

⚠ For greater system accuracy and durability, maintain a solid interface between the electric motor coupling and the measuring unit disc.

⚠ There must be no contact points between the motor shaft and the measuring unit housing components, this can cause premature wear and system failure.

⚠ Do not direct high pressure water jets at IPS components.

▪ BOSCH operation manual

• Operating Instructions - Part IV

BATTERY

⚠ Be careful when installing the battery, read the battery instruction manual and installation guide. When installing the battery, check that the battery polarity is correct.

⚠ Always check that the battery conforms to the specification!

⚠ The system is unprotected against reverse polarity. The inverted connection can cause serious personal and property damage.

⚠ Do not disconnect the batteries while the system is running.

⚠ If it is necessary to recharge the batteries, disconnect them from the electrical system and carry out a slow charge

⚠ Do not short-circuit the batteries. It can cause serious personal and property damage.

⚠ After transport, always check that the batteries have not leaked.

COMPONENTS

⚠ InstaleInstall the system/product at a sufficient distance from engines, exhaust systems and electrical equipment to prevent overheating.

⚠ For any service queries, please refer to page 98.

⚠ Be sure to install components in areas free from contact with moving parts and with a firm connection to the chassis to avoid damage during movement.

⚠ When installing or removing the system, always keep the display and PowerBox off.

⚠ Some harnesses are not short circuit protected. Short circuits can damage electronic control units (ECU) and engines.

⚠ Before welding the seeder or tractor, disconnect all batteries, electronic modules and engine harnesses.

⚠ Do not solder near sensors, ECUs, harnesses and IPS devices. If necessary, remove these components in advance to avoid any damage to the system.

⚠ To disconnect the ECUs do not use tools, disassemble the connector using gentle hand force.

⚠ Do not force the electrical harnesses, risk of damage to the ECU

▪ BOSCH operation manual

• Operating Instructions - Part V

FUNCTIONAL SAFETY

To prevent the system/product from being misused, always comply with product safety and best practices.

⚠ **Before use, please ensure that this document is fully read and understood.**

⚠ **Always wear personal protective equipment during use, maintenance and transport.**

⚠ **Always use the padlock to lock the PowerBox protective cover.**

⚠ **Do not operate the PowerBox with the cover open.**

⚠ **Always use specified batteries.**

⚠ **Make sure the batteries are fixed before use.**

⚠ **Beware of electric shocks when working with batteries.**

⚠ **Check the state of circuit fuses before use. Never replace a fuse with a larger capacity or before finding the root cause of the blown fuse.**

⚠ **Take care to avoid reverse polarity of batteries and connectors.**

⚠ **Beware of electric shocks when working with batteries.**

SAFETY AND PRECAUTIONS IN INSTALLATION

Before installation, please ensure that this document is fully read and understood.

⚠ **For installation, make sure all necessary tools are available. Always wear personal protective equipment during installation.**

⚠ **During transport and installation, do not handle heavy components alone. At least two people are required.**

⚠ **Make sure the harnesses are properly secured and connected to avoid tangles and breakage.**

⚠ **During installation or removal of the system disconnect all possible loads from the system (master switch, tractor interface harness, hydraulic flow).**

▪ BOSCH operation manual

• Operating Instructions - Part VI

ENERGY CONSUMPTION / ENERGY OUTPUT

⚠ The PowerBox system supplies electrical power exclusively to the IPS system at up to 80 A and 24 V. Always check the PowerBox main switch ON/OFF before starting and finishing work. Do not leave the main switch on when not in use.

⚠ The display and ECUs are connected to the tractor battery. Both components, display and ECUs, are powered at 12V.

GENERAL REMARKS ON SERVICE, REPAIR AND MAINTENANCE

⚠ Due to the technical requirements of the system, the risk of product integrity and life is not allowed for any unauthorized person to repair, maintain or replace any components of the Bosch IPS.

⚠ Do not weld near sensors, ECUs, harnesses, hydraulic lines and IPS devices. If necessary, remove these components in advance to avoid any personal or property damage.

POWERBOX BATTERIES

⚠ The PowerBox comprises positive and negative battery cables labeled for correct mounting to the corresponding battery terminals as specified in the PowerBox offering drawing. The correct mounting position of batteries, positive and negative cables are indicated by color, length, cable position and label on the terminals.

- Black cable: Negative pole.
- Red cable: Positive pole.

⚠ Before any service, repair or maintenance:

- Always use personal protective equipment;
- Make sure that the person performing the service, repair or maintenance is capable of performing this activity and has read this document before any intervention;
- Disconnect all possible loads from the system (general switch, tractor interface harness, hydraulic flow);
- Do not disconnect the batteries while the system is running.
- If necessary, to recharge the batteries, remove them from the PowerBox and carry out a slow charge.

BOSCH operation manual

• Operating Instructions - Part VII

BATTERY-FREE OPERATION

⚠ Operation of the Bosch IPS without the PowerBox battery is not permitted.

⚠ Bosch IPS is not protected against a load dump on the battery lines. Load dump occurs in the event that a battery is disconnected while the alternator is operating.

⚠ Batteries must be connected during the entire operation of the Bosch IPS.

⚠ Batteries can only be disconnected after the PowerBox and hydraulic flow are turned off.

BATTERY REMOVAL

⚠ Make sure that all possible loads are disconnected from the battery;

⚠ Disconnect the battery terminal cables from both batteries by loosening the cable clamp screws. Remove the negative cables first, then the positive;

⚠ Loosen the battery retaining strap;

⚠ Pull up on the first battery to remove it from the PowerBox, taking care to keep it as straight as possible. This will minimize the possibility of spilling electrolytes and damaging other Bosch IPS parts or even planter parts. Do not lift the battery by the terminals;

⚠ Inspect the removed battery for possible damage or corrosion; Ensure proper disposal.

⚠ Repeat the above procedures to remove the other battery.

INSTALLING NEW BATTERIES - PART I

⚠ Clean the surface where the batteries rest on the PowerBox;

⚠ Inspect all battery cables and, if there are signs of dirt or corrosion, use steel wool or a wire brush to gently clean the cable terminals;

⚠ Make sure the new battery is fully charged. When fully charged, the battery’s open pole voltage must be at least 12.6V at 27°C;

▪ BOSCH operation manual

• Operating Instructions - Part VIII

INSTALLING NEW BATTERIES - PART II

⚠ Place the new battery in the PowerBox. Insert the left battery (Battery 1) first and then the right (Battery 2);

⚠ Make sure the batteries are facing the proper direction, in which case the positive and negative terminals line up with their corresponding leads;

⚠ Fix the battery securing strap in its original position over the new batteries, ensuring they are properly secured to prevent movement or vibration wear;

⚠ Attach battery cables. Always attaching the positive (red) cables first, followed by the negative (black) cables. Do not over-tighten the terminal screws, knock or lift the batteries by the terminals.

TECHNICAL RECOMMENDATIONS AND BATTERY CARE

⚠ Avoid short circuits between the positive battery terminal and the machine chassis when using tools or handling battery cables;

⚠ New batteries or batteries in use must not remain for long periods without charging. After a maximum of 6 (six) months, the open pole voltage must be maintained at a minimum of 12.4 V;

⚠ To protect battery terminals from corrosion, use petroleum jelly. Other substances can electrically insulate battery terminals;

⚠ Never block the gas outlet holes as this can cause gas buildup and even explosion. Remove all original battery packing material prior to installation and do not use rubber mats on top of the battery. If insulation of the battery terminals is required, use liquid insulation or plastic caps on the cables;

⚠ Avoid rapid battery charges, only in extremely necessary situations and do not allow the battery to exceed 50 °C. The rated charging current will be 10% of the capacity in Ah. Always check the battery manufacturer's manual.

⚠ Check the mounting surface for foreign objects or protrusions that could damage the housing or cover;

⚠ Make sure the battery is level in the tray;

⚠ Do not lift or handle the battery by the terminals;

⚠ Avoid bumping or pinching the battery terminals, this can lead to acid leaks or loss of connections;

▪ BOSCH operation manual

• Operating Instructions - Part IX

REVERSE POLARITY OF POWERBOX BATTERIES

⚠ The PowerStage and ECU housings are directly connected to the respective ground and to the battery (-). Do not short the battery (+) and component housings. Permanent damage.

⚠ Do not reverse the polarity of the PowerBox battery. Permanent product failure.

⚠ During any intervention on the PowerBox battery, check the proper polarity of the battery and do not switch on the PowerBox if the battery cables are incorrectly installed.

⚠ Non-compliance can lead to damage or failure of Bosch IPS devices and the PowerStage housing can be overheated.

⚠ The PowerBox main switch must be in the OFF position before installing and/or maintaining batteries.

REVERSE POLARITY OF THE TRACTOR BATTERY

⚠ Do not reverse the tractor battery polarity. Permanent product failure.

⚠ The PowerBox must be turned off before installing and/or maintaining the tractor battery.

⚠ Check for proper battery polarity against tractor specifications and do not turn on the PowerBox if battery cables are incorrectly mounted.

⚠ Non-compliance can lead to damage or failure of Bosch IPS devices.

POWERBOX ALTERNATOR

⚠ Avoid directing high pressure water jets at the alternator.

⚠ If the alternator is subjected to water, allow it to dry completely before using the alternator.

⚠ Do not carry out any maintenance on the alternator with the PowerBox or IPS ON.

▪ BOSCH operation manual

• Operating Instructions - Part X

ELECTRICAL INTERFACE

⚠ Keep all components away from water, components are designed to withstand minor interactions with water.

⚠ In the event of large volumes of rain, submersion and high pressure water jets, product reliability can be compromised.

⚠ Harnesses are not short-circuit protected to positive. Short circuiting can damage electronic control units (ECUs).

HYDRAULIC INTERFACE

⚠ It is recommended to have a pair of VCR connections with flow control and float function for each PowerBox installed in the system.

⚠ Ensure a free-flowing drain connection to the tractor's oil reservoir. Failure to do so will cause hydraulic damage to the engine.

ASSEMBLY

⚠ During installation or removal of the system, keep the tractor ignition (T15) and PowerBox both in the OFF position.

STORAGE

⚠ IPS components must not be stored in damp conditions (assembled and disassembled components). While in the original packaging, components must be stored in a dry, temperature-controlled place and kept in a horizontal position and must not be exposed to condensation and animal damage, eg moisture and mice.

⚠ Handle with care, the product must not be dropped or subjected to unusual shocks. Avoid storing in the presence of corrosive gases, acidic or basic media, as well as sulfur compounds and sulfuric materials.

BEFORE AND AFTER THE OPERATION

⚠ Before operating the seeder for the first time, an installation check must be carried out and ensure proper installation of the IPS devices and calibrate the system for use.

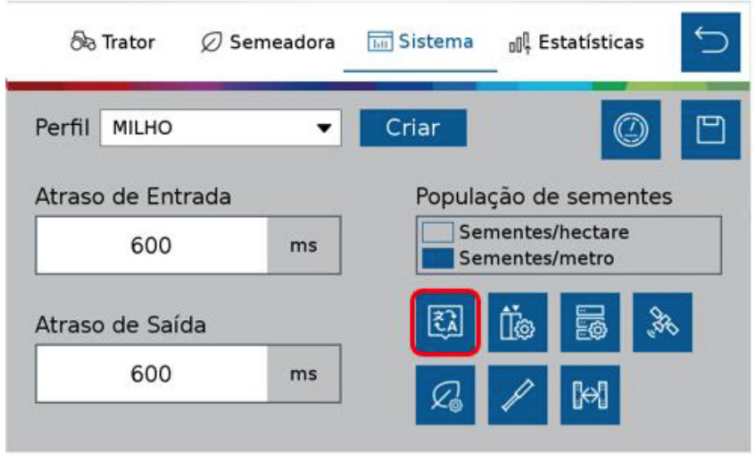
⚠ After the operation, be sure to turn off the PowerBox and the Display IPS. For long term storage, see item above.

▪ BOSCH operation manual

• Initial system settings

1 - LANGUAGE SETTING

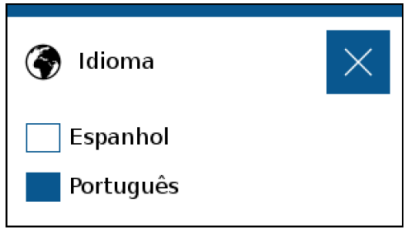
To access the language setup screen, the user must press the “Language Setup” button.





Button for language selection screen

When selecting the screen below, the user can select the desired language, which can be Portuguese or Spanish.



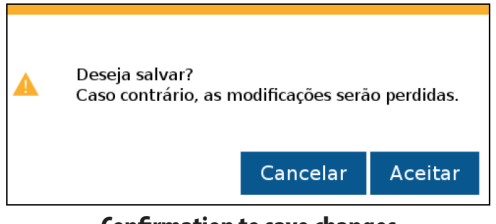
Language selection

Remembering that whenever the user makes any changes, the save button will be enabled.



Confirmation to save changes

If the user forgets to save any changes, a warning will appear on the screen as described.



Confirmation to save changes

▪ BOSCH operation manual

• Initial system settings

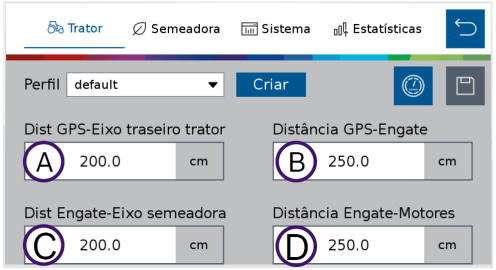
2 - TRACTOR DIMENSIONS CONFIGURATION

When selecting the settings menu, select the gear-shaped button on the application's home screen.

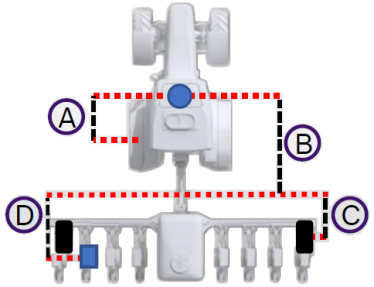


Settings button

When selecting the settings button, the screen below will be displayed.



Tractor parameter configuration



GPS antenna center

Engines

Seeder shaft

View of tractor dimensions

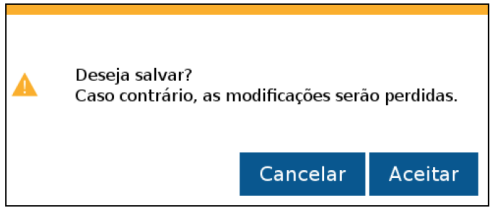
Take measurements accurately with the planter lowered. Incorrect measurements lead to malfunction of the IPS system.

a) Distance between the center of the GPS antenna to the rear axle of the tractor.
b) Distance between the center of the GPS antenna to the implement hitch.
c) Distance from the implement hitch to the center of the seeder wheels.
d) Distance from implement hitch to motors position.
e) Save button: this button is used to save the changes that the user has made in the application. When it is gray, it means that no changes have been made. When it's blue, it means there are changes to save.



Confirmation to save changes

A save alert will appear on the screen if the user has made any changes and wants to leave the current screen without having saved the changes.



Confirmation to save changes

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

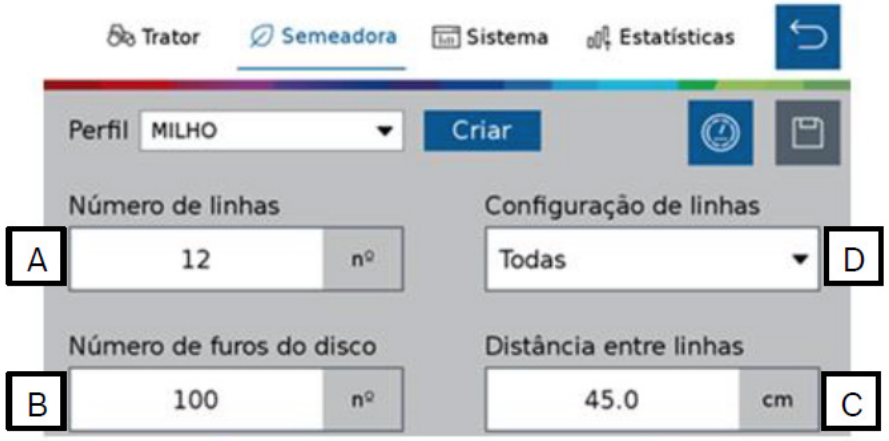
All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

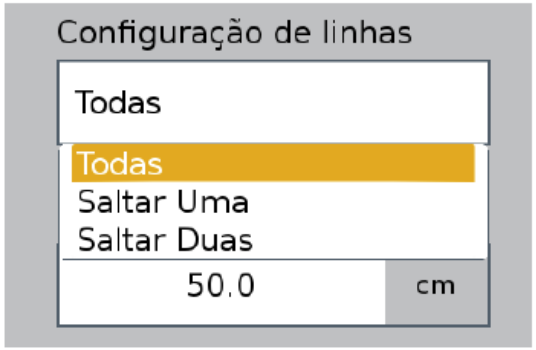
3 - SETTING THE NUMBER OF HOLES ON THE DISK, LINES AND DISTANCE BETWEEN LINES - PART I

To access the seeder configuration screen such as the number of holes on the disc, number of lines and distance between lines, access the “Seeder” tab.





Seeder settings button



Line selection

When returning to the home screen to continue the work, remember to save the changes, as informed on the previous page (Button to save the changes made).

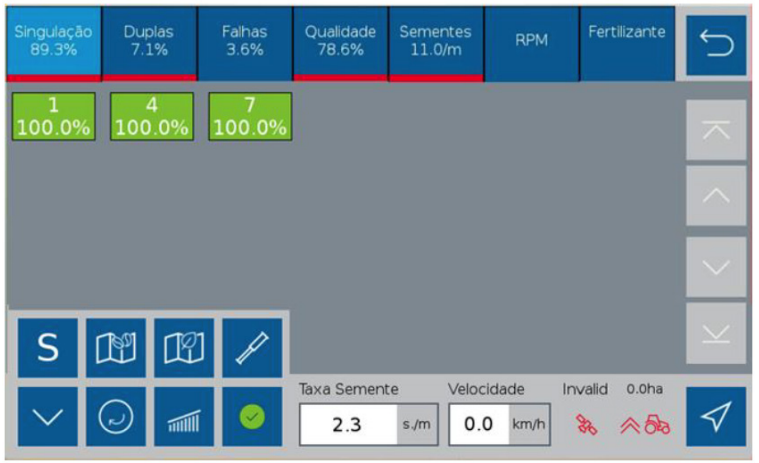
BOSCH operation manual

• Initial system settings

3 - SETTING THE NUMBER OF HOLES ON THE DISK, LINES AND DISTANCE BETWEEN LINES - PART II



Planting screen with setting to skip a line



Planting screen with setting to skip two lines

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

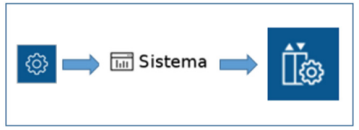
All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

BOSCH operation manual

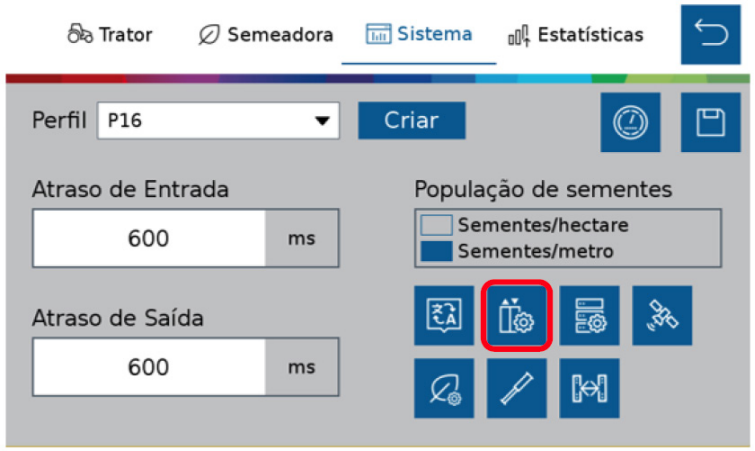
• Initial system settings

4 - SETTING THE LIFT SENSOR

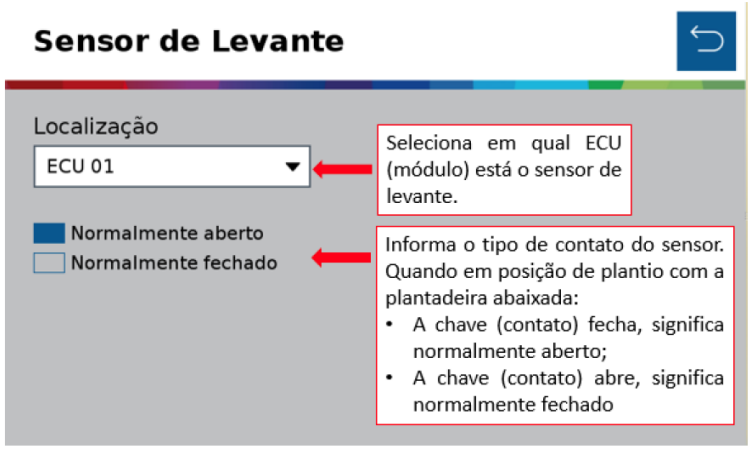
To access the lift sensor configuration screen, access the “System” tab and then the lift sensor configuration button.



Button for lift sensor screen



Then the following screen will be displayed.



Lift sensor setup screen

Remembering that whenever the user makes any changes, the save button will be enabled. If the user forgets to save any changes, a warning will appear on the screen as described on page 104.

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

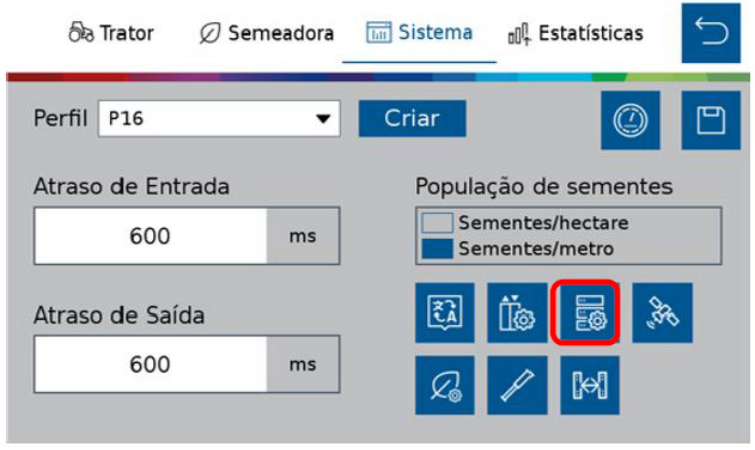
• Initial system settings

5 - ADDITIONAL SENSORS CONFIGURATION - PART I

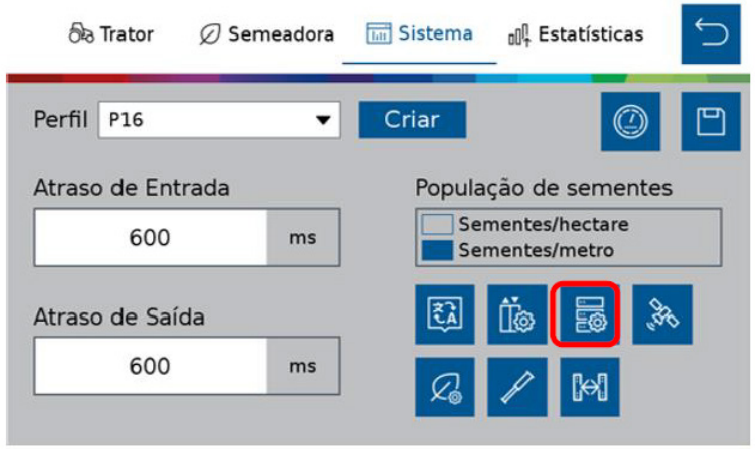
To access the additional sensors configuration screen, the user must press the “Additional sensors configuration” icon.



Button for additional sensors screen



Then the following screen will be displayed.



Additional sensors editing screen

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

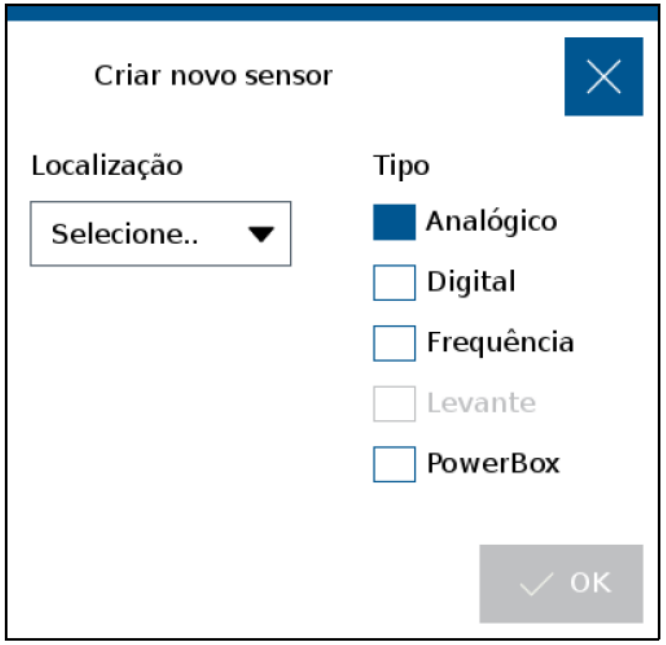
All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

5 - ADDITIONAL SENSORS CONFIGURATION - PART II

This screen below allows the configuration of different types of additional sensors installed in the system. The system allows the installation of sensors such as a vacuum gauge, rotation or pressure sensor for example. Remembering that the installation must be carried out by a qualified person.



Create a new sensor screen

a) Create sensor: opens the additional sensor creation screen, where the user will inform the sensor installation location, such as ECU 1 (module 1).

b) Button to edit sensor configuration parameters.

c) Button to delete the selected sensor. When selected, a confirmation prompt will appear on the screen.

It is important to know the type of sensor that will be installed to calibrate it correctly, consult the sensor manual to perform the calibration.

Remembering that whenever the user makes any changes, the save button will be enabled. If the user forgets to save any changes, a warning will appear on the screen as described on page 104.

⚠ ATTENTION

The system comes from the factory with the PowerBox1 sensor configured in ECU 1, with 6 pulses per revolution and cannot be changed or eliminated as it is a PowerBox monitoring sensor.
For applications with more than 30 lines, create the PowerBox 2 sensor according to the instructions on the next page.

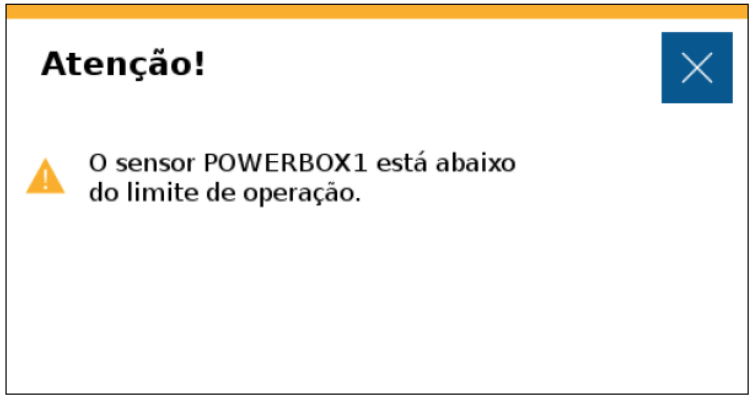
▪ BOSCH operation manual

• Initial system settings

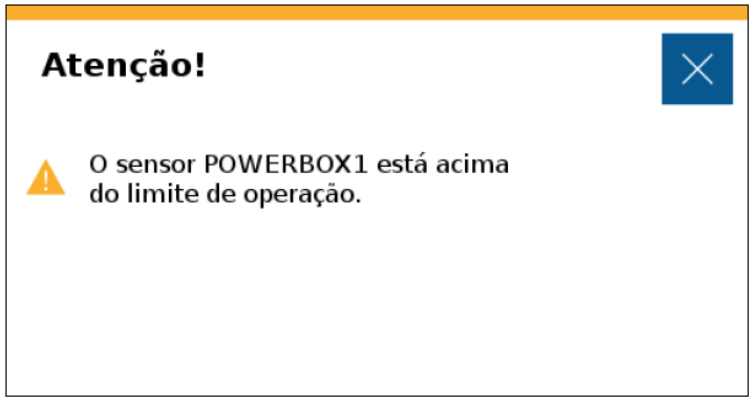
6 - POWERBOX ALERT SENSOR

As mentioned on the previous page, the IPS system comes standard with a PowerBox alert sensor configured. It is possible to add a second alert sensor to the PowerBox 2 for applications with more than 30 lines.

If the PowerBox RPM sensor is below or above the operating limit, the following alerts will be displayed on the operator screen:



PowerBox sensor alert below operating limit



PowerBox sensor above operating limit alert

In addition to visual alerts, a buzzer will sound an audible signal to the operator.

For the correct installation and adjustment of the PowerBox, proceed according to the instructions on pages 168 to 170.

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

7 - FERTILIZER SUBSYSTEM CONFIGURATION - PART I

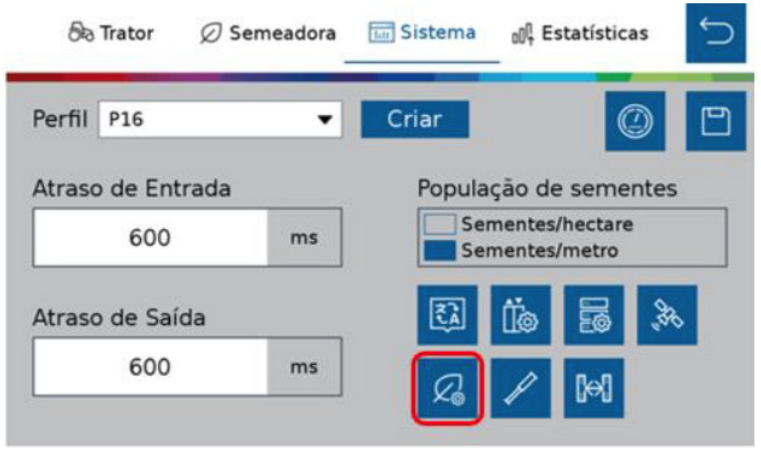
⚠ ATTENTION

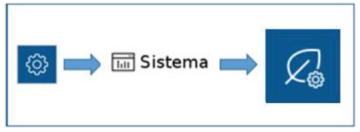
Handle Agricultural Chemicals Safely
Chemicals used in agricultural applications such as fungicides, herbicides, insecticides, pesticides, rodenticides and fertilizers can be harmful to your health or the environment if not used carefully.
Always follow label instructions for effective, safe and legal use of agricultural chemicals.

⚠ ATTENTION

Keep distance from the moving shafts
Winding on rotating shafts and cardans can cause serious injury or death.
Keep transmission guards in place at all times.
Wear appropriate tight clothing. Shut off engines, ensure that the system is not running, and that the engines are stopped before any adjustments or cleaning of any equipment driven by the IPS system is made.

To access the fertilizer setup screen, the user must press the "Fertilizer Setup" icon:





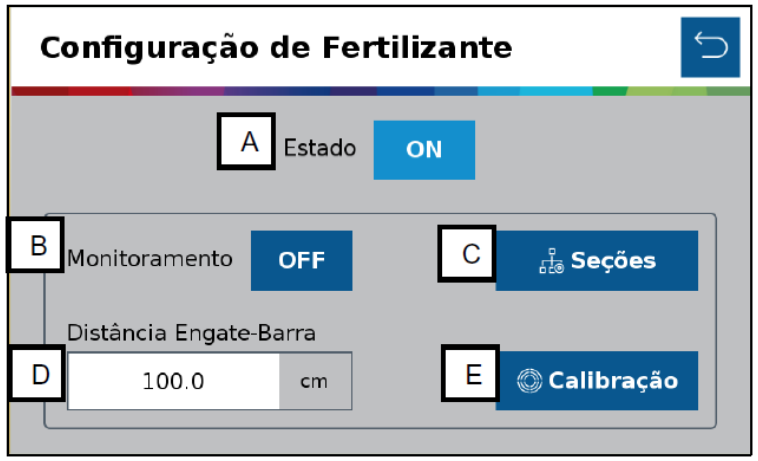
Button for fertilizer setup screen

▪ BOSCH operation manual

• Initial system settings

7 - FERTILIZER SUBSYSTEM CONFIGURATION - PART II

Then the following screen will be displayed:



Fertilizer Setup Screen

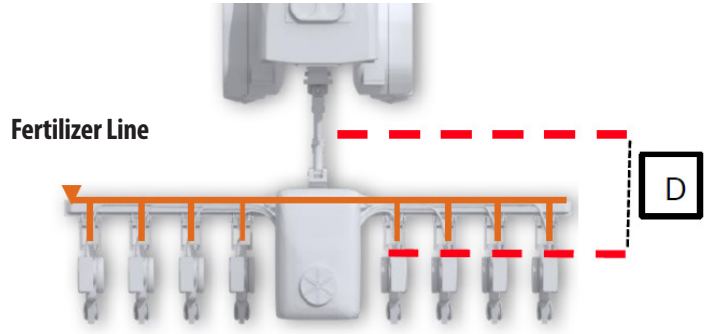
a) Status: master switch to enable or disable the fertilizer system.

b) Monitoring: Turns fertilizer sensor alerts on or off to control clogged lines and view line by line on the work screen.

c) Sections: access to the menu for configuring the fertilizer sections present in the seeder.

d) Coupling-Bar Distance: distance in cm between the coupling and the average distance of the fertilizer tubes, according to **detail "D".**

e) Calibration: access to the fertilizer system calibration menu.



▪ BOSCH operation manual

• Initial system settings

8 - FERTILIZER SECTIONS CONFIGURATION

To access the fertilizer sections configuration screen, the user must press the “Sections” icon in the fertilizer subsystem start menu (previous page). The screen below will be displayed:





Setting up fertilizer sections

a) In the Section Seção submenu, inform the number of sections and fertilizer controllers present in the seeder. Click the + icon to add sections or controllers and the - icon to remove. Each controller is capable of controlling up to 5 fertilizer sections.

b) Click on each section and inform the number of lines present in each section.

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

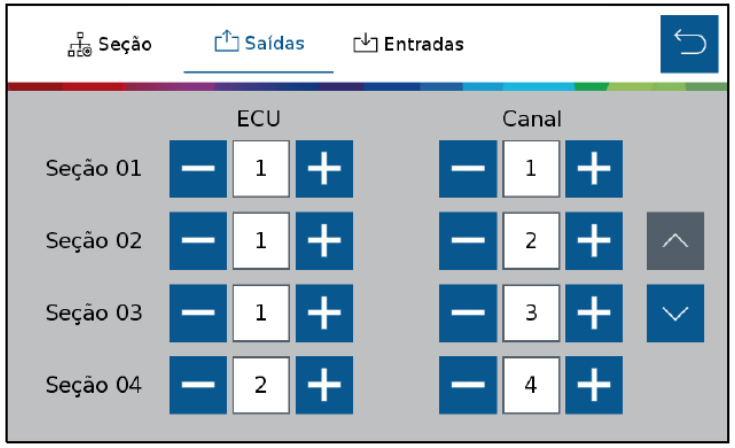
All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

9 - FERTILIZER SUBSYSTEM OUTPUT CONFIGURATION

Access the fertilizer subsystem home menu (page 112) and select the outputs Saídas icon to configure the ECU and the channel in which the fertilizer subsystem hydraulic motor rotation sensors are installed. Each sensor must be installed on a dedicated ECU and channel, select through the "+" and "-" buttons the channel dedicated to each sensor.



Setting up fertilizer outputs

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

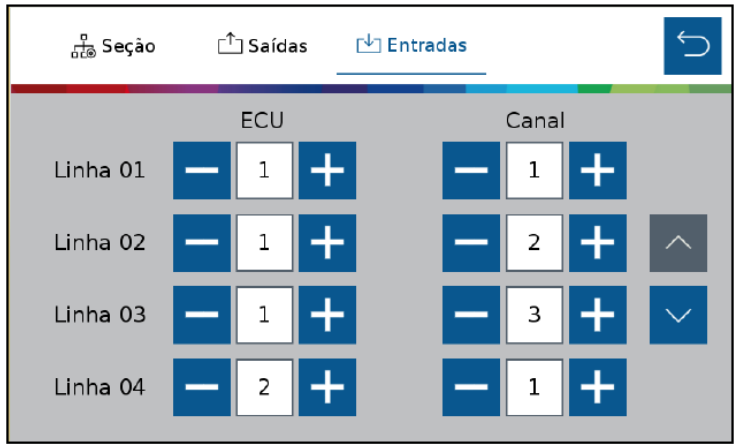
All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

10 - CONFIGURATION OF FERTILIZER SUBSYSTEM INPUTS

Access the fertilizer subsystem home menu (page 112) and select the inputs Entradas icon to configure the ECU and the channel in which the fertilizer sensors are installed. Each sensor must be installed on a dedicated channel and ECU, select by means of the “+” and “-“ buttons the ECU and the channel dedicated to each sensor.



Setting up fertilizer inputs

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

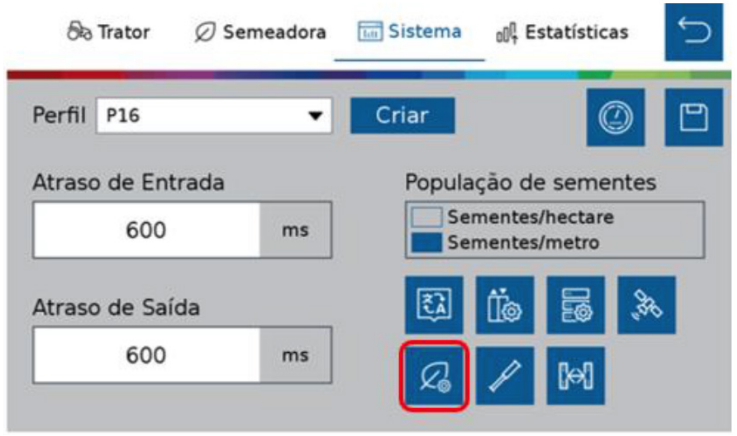
All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

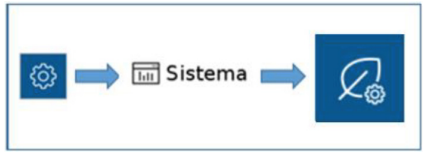
▪ BOSCH operation manual

• Initial system settings

11 - CALIBRATION OF THE FERTILIZER SUBSYSTEM - PART I

To access the fertilizer subsystem calibration screen, the user must press the “Fertilizer Setup” icon:

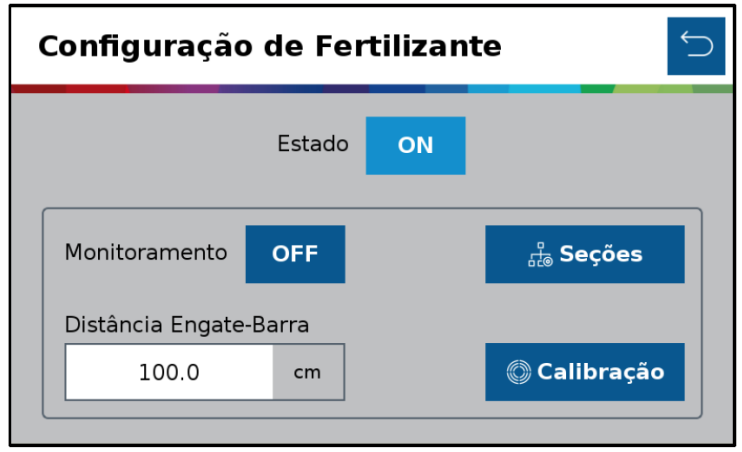




Button for fertilizer setup screen

Then select the calibration icon 

:



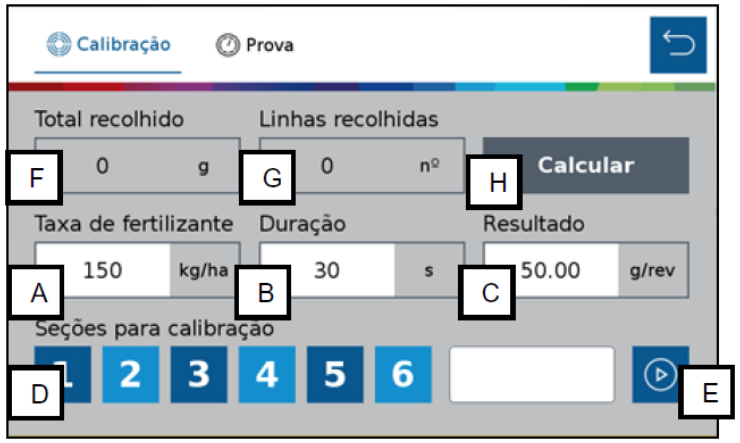
Fertilizer Setup Screen

▪ BOSCH operation manual

• Initial system settings

11 - CALIBRATION OF THE FERTILIZER SUBSYSTEM - PART II

On the calibration screen below, enter the values in items “A” and B” according to agronomic guidance.



Fertilizer calibration screen

a) Fertilizer rate: inform the desired fertilizer application rate according to agronomic guidance.

b) Duration: enter the time you want to perform the test for fertilizer collection.

c)Result: Expected weight at each revolution will be calculated by the system during calibration.

d) Calibration Sections: Select which sections will be linked for fertilizer collection during the test. After the calibration is completed, all sections will receive the same adjustments.

e) Place the collectors on the fertilizer downpipes of all the lines of the previously selected sections and click on the start button .

NOTE **It is recommended to carry out step “E” three times in a line to equalize the fertilizer batchers, discard the collected fertilizer, replace the collectors in the tubes and only then proceed to step “F”.**

f) Total collected: after the test is completed, add and weigh the fertilizer collected from all the lines tested and report in the field.

NOTE **Remember to disregard the weight of the collecting container in step “F”.**

g) Rows collected: inform the number of lines that fertilizer samples were collected.

h) Calculate: the system will perform the calculation and adjustments with the values previously informed.

NOTE **It is recommended to carry out the calibration at each planting start or at each fertilizer change. Carry out the calibration with the hydraulic oil at working temperature.**

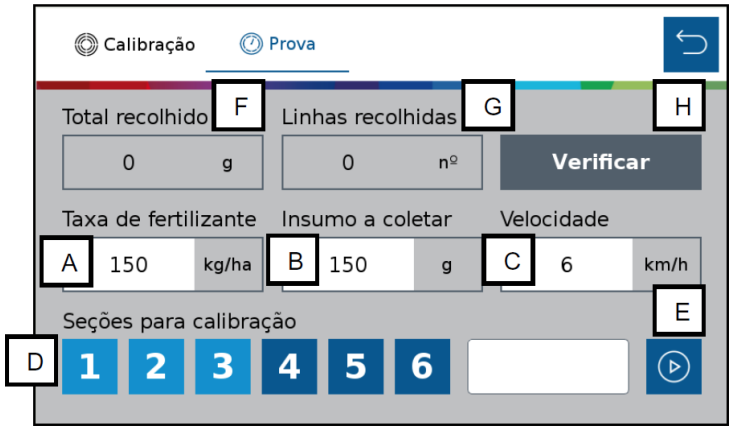
▪ BOSCH operation manual

• Initial system settings

12 - FERTILIZER SUBSYSTEM TEST

After performing the calibration of the fertilizer subsystem, it is recommended to carry out a system test for the fine adjustment of the components and a real test of the calibration.

To access the fertilizer subsystem test, select within Prova the "Fertilizer configuration" menu (previous page). The screen below will be displayed:



Fertilizer test screen

a) Fertilizer rate: inform the desired fertilizer application rate.

b) Input to be collected: inform the amount of fertilizer to be collected in the test.

c) Speed: simulated speed at which planting will take place.

d) Calibration Sections: Select which sections will be linked for fertilizer collection during the test. After the calibration is completed, all sections will receive the same adjustments.

e) Place the collectors on the fertilizer downpipes of all the lines of the previously selected sections and click the start button .

f) Total collected: after the test is completed, add and weigh the fertilizer collected from all tested lines and report in the field.

NOTE **Remember to disregard the weight of the collecting container in step "F".**

g) Rows collected: inform the number of lines that fertilizer samples were collected.

h) Calculate: The system will fine-tune the calibration with the reported results. Confirm that you want to update the "result" item "C" with the new value found in the test.

NOTE **It is recommended to carry out the test at each calibration. Carry out the test with the hydraulic oil at working temperature.**

▪ BOSCH operation manual

• Initial system settings

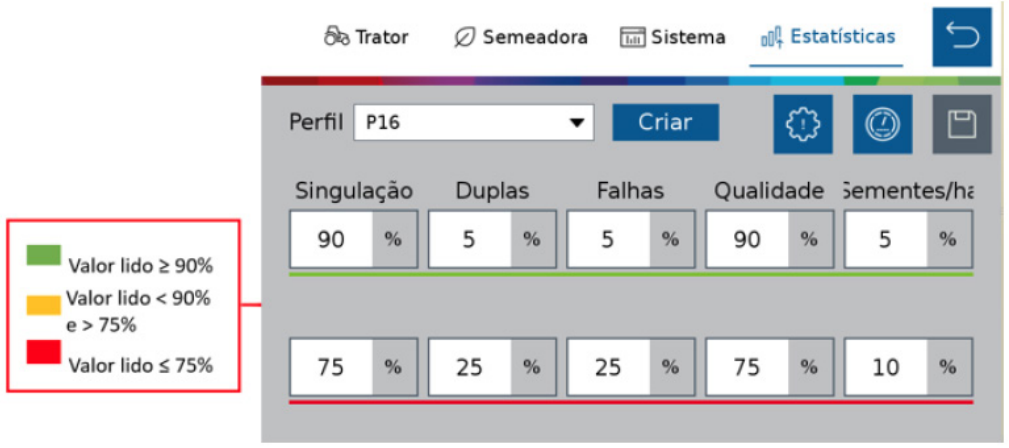
14 - CONFIGURATION OF STATISTICAL ALERTS - PART I

To configure the alerts related to statistics, access the “Statistics” tab:



Button for the statistics alerts setup screen

The user will be directed to the screen below, where he can adjust the parameters for viewing the planting statistics.



Configuration of statistics alarm parameters

The upper parameter line must be set to the desired percentage values for the crop to be planted. During planting, the stat values above the stipulated will be in green color.

The lower parameter line must be configured with the alert percentage values for planting. These are values adjusted for planting conditions considered bad/dangerous for the planted crop. During planting, the statistic values below the stipulated will be in red color, serving as an alert for the operator.

❗ IMPORTANT

To perform this configuration, the user needs to understand that the larger the seed population or the smaller the grain size, the smaller the classification threshold value for the green color should be. Due to the high number of seeds being deposited or their reduced size, the seed sensor has greater difficulty in accurately reading individual seeds and the adjustment value for indicators in green must be reduced.

▪ BOSCH operation manual

• Initial system settings

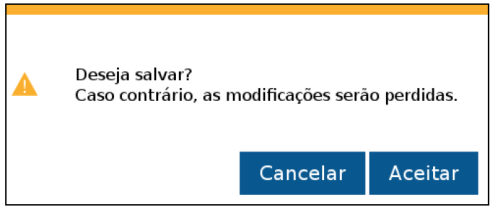
14 - CONFIGURATION OF STATISTICAL ALERTS - PART II

During planting, the statistic values between these two bands are represented in yellow. Remembering that whenever the user makes any changes, the save button will be enabled.



Button to save changes made

If the user forgets to save any changes, a warning will appear on the screen as described.



Confirmation to save changes

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

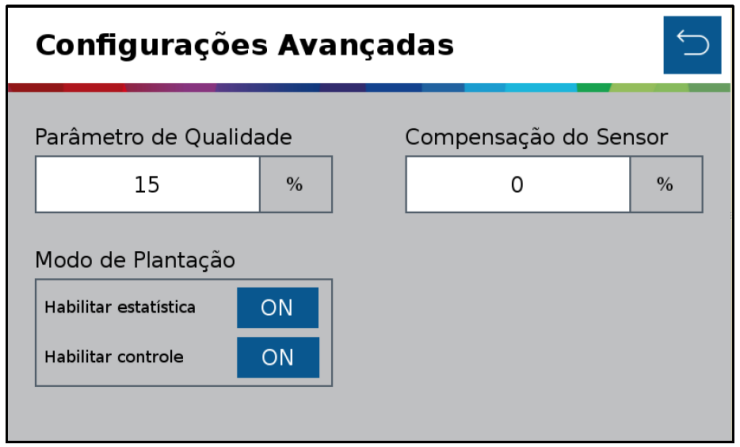
15 - ADVANCED SETTINGS - PART I

To configure the quality parameters and sensor compensation in the standard system, access the “Statistics” tab;



Statistics tab

Then select the button  to access the advanced settings screen below.



Configuration of statistics alarm parameters

The “Quality Parameter” is used to determine the planting quality limits. By factory default, it will be 15%. However, it is possible to adjust it, being able to be configured with values between 5% to 49%. The user must understand that making this adjustment will have direct consequences for planting.

- If the parameter is increased considerably, the planting statistics will be very considerable (failures and doubles can be considered as ok), and thus may not reflect exactly what the user wants to measure.
- If the parameter is considerably reduced, the planting statistics will be very restricted (ok planting can be considered as failure or double), and the quality may be lowered and not reflect the real one, due to the limitations of the batcher.

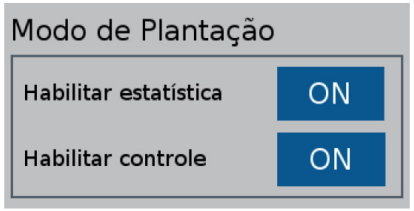
For the “Sensor Compensation” consider the average of all the seeder lines to perform the seed sensor error compensation. It is important to check for “false failures” directly in the ridge, to certify that the failures reported by the system are actually occurring. The sensor compensation can be configured with values between 0 to 100% and increasing the compensation value will consequently increase the singulation value and seeds per meter.

BOSCH operation manual

• Initial system settings

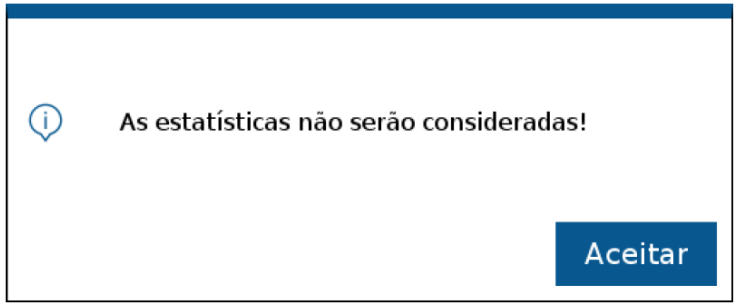
15 - ADVANCED SETTINGS - PART II

In the “Plant Mode” function below, you can:



Planting mode function

Disable stats, this way they cannot be cast. The following message will be:



Configuration of statistics alarm parameters

When returning to the home screen to continue working, remember to save your changes;



Button to save changes made

In the planting screen below, the statistics functions will not be displayed, only the monitoring function and engine RPM will be visible.



Monitoring screen

▪ BOSCH operation manual

• Initial system settings

15 - ADVANCED SETTINGS - PART III

- Disable motor control.

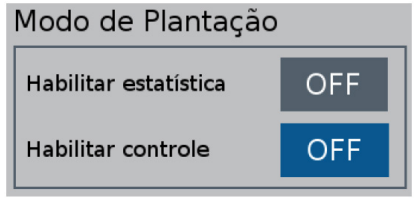
Note that while the control is disabled, statistics are also disabled.

When returning to the home screen to continue working, remember to save your changes;

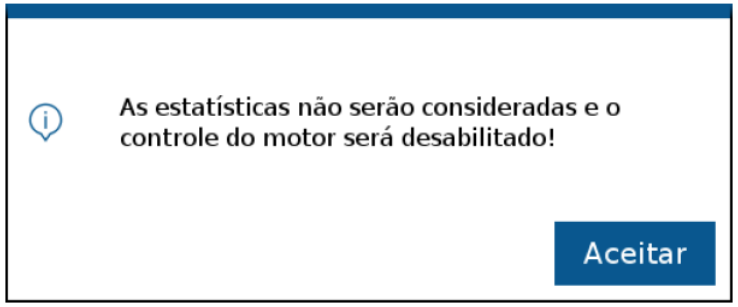


Button to save changes made

On the planting screen (previous page), when the control is disabled, the RPM section, related to electric motors, is unavailable. Therefore, the only available section is the monitoring section, as shown in the image on the side.



Planting mode function



Motor control and statistics disabled



Monitoring screen with control disabled

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

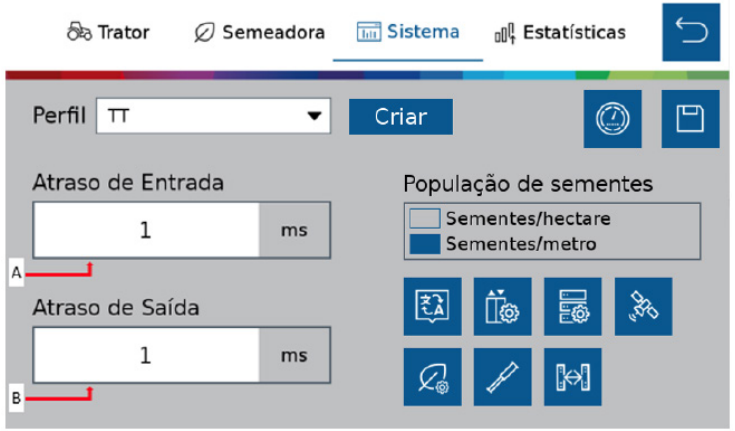
16 - AUTOMATIC CUTTING CALIBRATION - PART I

To configure and calibrate the automatic cut, access the “System” tab;



Auto cut setting screen button

The screen below will be displayed;



Screen for setting automatic cut

a) Entry delay: regulates the delay in milliseconds for the engines to shut down when entering an already planted area. As this value increases, the clipping happens earlier.

b) Exit delay: regulates the delay in milliseconds for the motors to restart when leaving an already planted area. As this value increases, re-powering happens earlier.

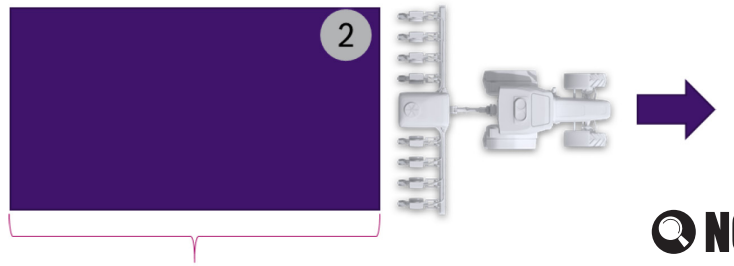
IMPORTANT

To measure and determine the values that must be entered in the input and output adjustment fields (previous screen), it is necessary that the machine is loaded with seeds, with availability of vacuum and that it has an area with sufficient dimensions to carry out the calibration procedure. Remembering that the more repetitions of the process are performed, the better the calibration of the cut will be.

To calibrate follow all the steps:

1. Set both input delay and output delay to 0 ms.

2. Mark the soil, with the seeder lowered and **without vacuum**, so that seeds are not deposited in the soil.



Min. 3.5 x seeder width Soil

Marking without vacuum

NOTE

It is recommended that the length of the reference area is 3.5 times the width of the seeder.

▪ BOSCH operation manual

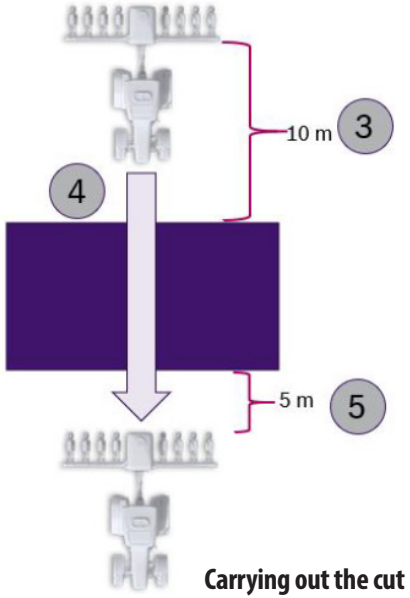
• Initial system settings

16 - AUTOMATIC CUTTING CALIBRATION - PART II

3. After marking, lift the seeder, position it at 90 degrees from the area marked in step 2 at least 10 meters away from the beginning of the area.

4. Turn on the vacuum, start the movement towards the reference area and lower the seeder. Drive the seeder at a constant 7 km/h across the area.

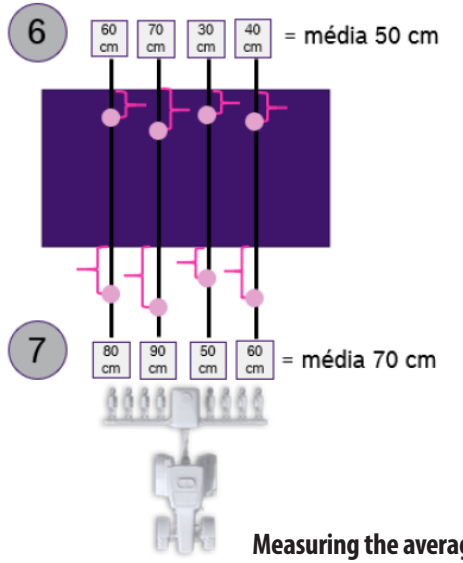
5. After passing 5 meters from the area marked in step 2, stop the machine.



Carrying out the cut

6. With a tape measure, measure the distance between the beginning of the area marked in step 2 and the first seeds that were deposited within the reference area. Take the average of the previous measurements, which in this example is 50 centimeters. This is the distance you want to anticipate the cut.

7. Then measure the average of the distances to the first seed deposited after the area marked in step 2. For example, when measuring 70 centimeters, this means that this is the distance you want to anticipate the restart of the motors.



Measuring the average distances on the ground

8. The values measured in items 6 and 7 must be converted before being entered in the entry delay and exit delay field (previous page). To do this, multiply the distances found in the previous steps by 5.

▪ BOSCH operation manual

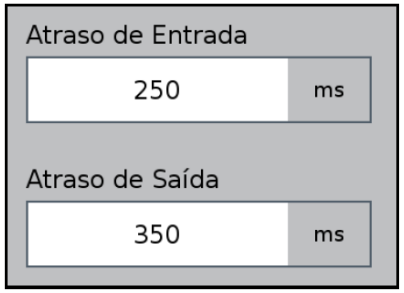
• Initial system settings

16 - AUTOMATIC CUTTING CALIBRATION - PART III

IMPORTANT | **Follow all steps correctly. If the speed of 7 km/h cannot be maintained during cutting or the quality of the GPS signal is not satisfactory, the adjustment will be impaired.**

Therefore:

- 50 * 5 = 250ms.
- 70 * 5 = 350ms.



Adjustment of cutting parameters

These would be the trim calibration parameters for the first input and output delay measurement in the example cited.

NOTE | **It is important to perform these procedures at least three times to ensure the system is well calibrated.**

If in the next entry and exit delay measurement procedure, the seed distance averages are, for example, 10 cm and 5 cm, in steps 6 and 7 respectively, the values entered on the screen (page 124) must be adjusted accordingly. explanation below: engines.

▪ BOSCH operation manual

• Initial system settings

16 - AUTOMATIC CUTTING CALIBRATION - PART IV

- **Entry delay:** 250 (saved previously in item 8) + 50 (average of the second pass in area 2 = 10 cm * 5) = 300 ms.
- **Outlet delay:** 350 (saved previously in item 8) + 25 (average of the second pass in area 2 = 5 cm * 5) = 375 ms.

The same principle applies to the third measurement.

If the cut happens earlier than expected (no seeds before the reference area) or the system restarts overlapping (seeds within the reference area), it is necessary to adjust by **subtracting** the values calculated in steps 6 and 7 (previous page):

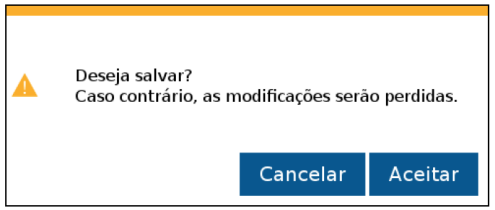
- **Entry delay:** 250 (saved previously in item 8) - 50 (average of the second pass in area 2 = 10 cm * 5) = 200 ms.
- **Outlet delay:** 350 (saved previously in item 8) - 25 (average of the second pass in area 2 = 5 cm * 5) = 325 ms.

Remembering that whenever the user makes any changes, the save button will be enabled.



Button to save changes made

If the user forgets to save any changes, a warning will appear on the screen as described.



Confirmation to save changes

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

▪ BOSCH operation manual

• Initial system settings

17 - EXCHANGE AND PROFILE CREATION - PART I

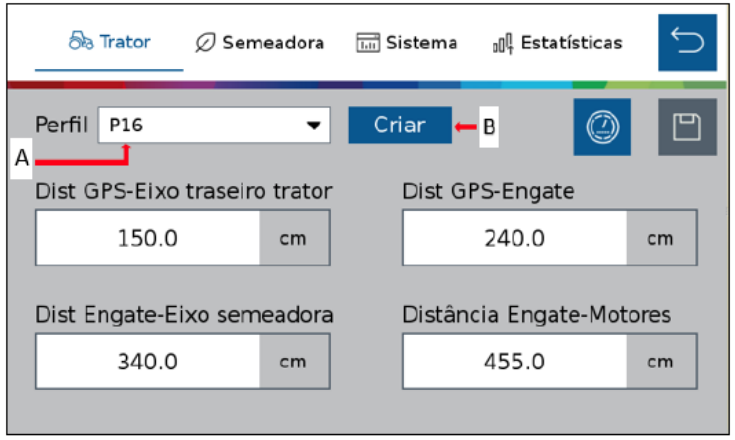
The IPS system allows the creation of different configuration profiles that gather all the parameters (Tractor, Seeder, System and Statistics); It can be used as a particular configuration for each crop planted, especially when changing the discs of the batchers, with a different number of holes, or using different tractors in the same seeder. In this way, the user will not need to adjust all the configuration parameters whenever planting a different crop or changing tractors.

To create a new profile, select the configuration button;



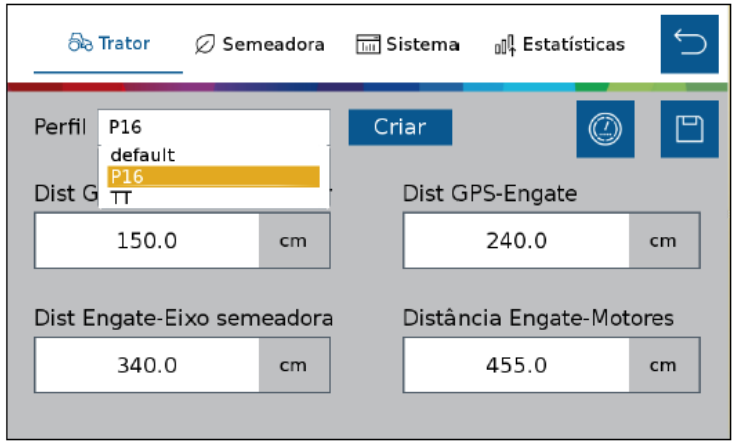
Settings button

hen the settings screen below will be displayed; This screen is divided into 4 sections: Tractor, Seeder, System and Statistics. In any of these 4 sections it is possible to create a new profile.



Access screen for profile creation

a) Button to select one of the existing profiles in the application, when selected, all existing profiles will be displayed in the window. The selected profile is available to change configuration parameters.



Profile selection button

▪ BOSCH operation manual

• Initial system settings

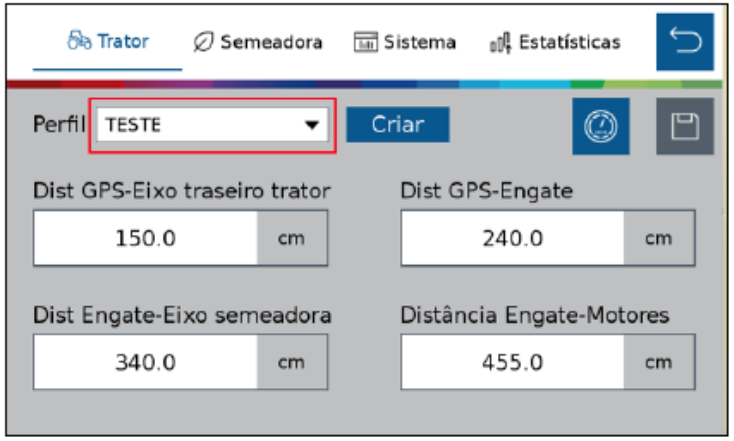
17 - EXCHANGE AND PROFILE CREATION - PART II

b) Button to create a new profile. When selected, the screen below will be displayed.



Naming a new profile

After naming the new profile and selecting ok, the new profile will be selected, being possible to edit and adjust the parameters you want.



Settings screen with new profile created

⚠ ATTENTION

If you do not have technical knowledge, do not change any parameters on this screen. The system may not work or malfunction if any parameter is not correct.

NOTE

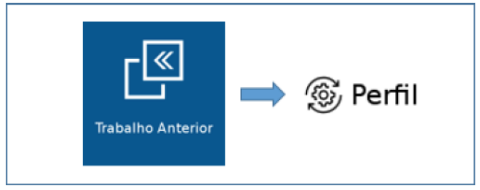
All parameters will be configured by those responsible for installing the system during the technical delivery. Instructions must be followed.

BOSCH operation manual

• Initial system settings

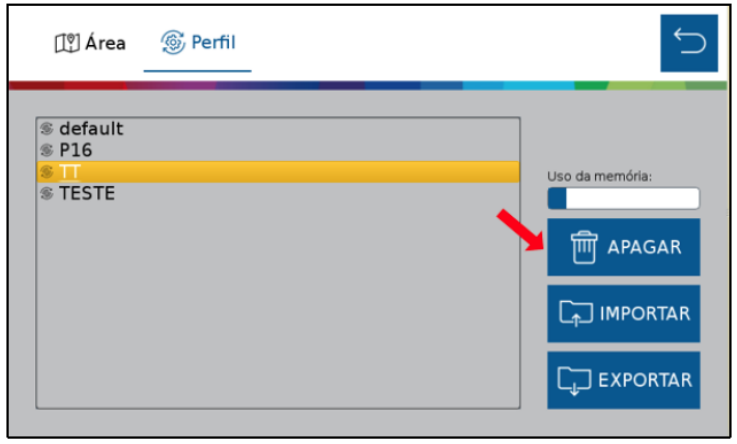
18 - DELETE PROFILE

To access the profile management screen, select the “Profile” button:



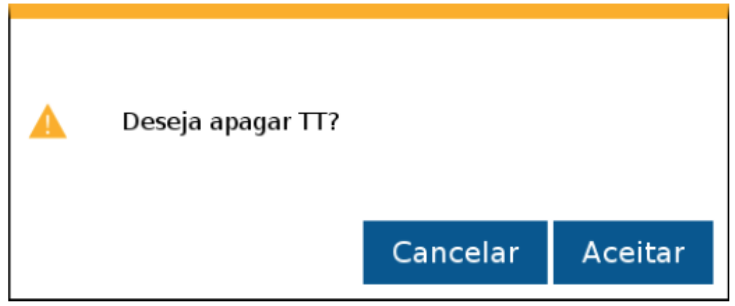
Button for application profiles configuration screen

The screen below will be displayed. It displays all existing profiles in the application. To delete a profile, select the profile you want to delete and then select the delete button.



Button for application profiles configuration screen

Soon after, the following warning will be displayed on the screen below, where the user can confirm or cancel the action:



Confirmation to delete selected profile

▪ BOSCH operation manual

• Initial system settings

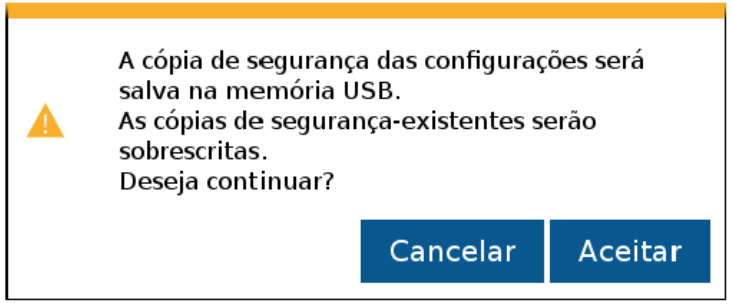
19 - EXPORTING PROFILE

To export the compiled profiles to a USB stick, select “Export”:



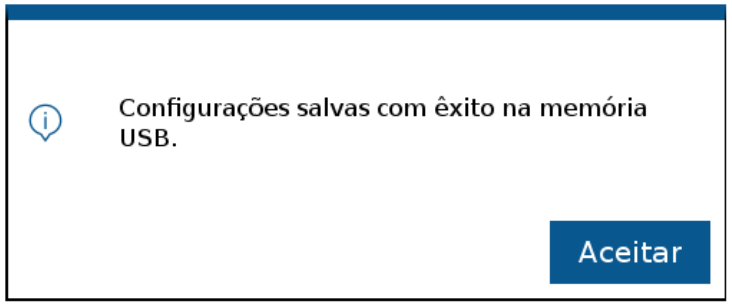
Path to export profile

Then the following warning will be displayed:



Confirmation notice to export profile

Upon accepting, when the export is complete, the following confirmation prompt will be displayed, **Error! Reference source not found.:**



Successful export notice

NOTE

All existing profiles in the application will be exported together in a single compiled file. All files on the flash drive will be deleted and replaced by the profile build.

BOSCH operation manual

• Initial system settings

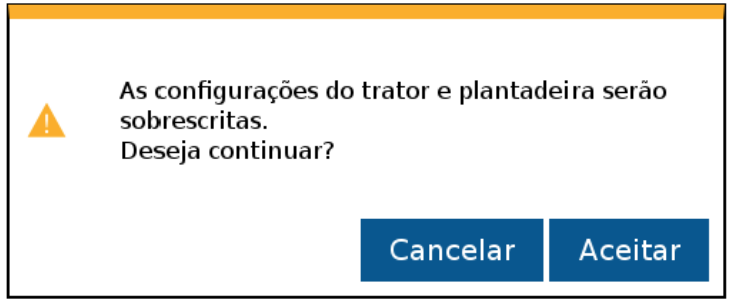
20 - IMPORTING PROFILE

To import the compiled profiles from the flash drive, select the “Import” button:



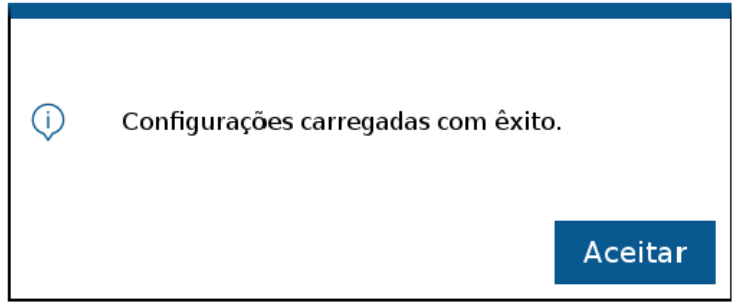
Path to import profile

Then the following warning will be displayed:



Confirmation notice for importing profile

After accepting and after the import is complete, the following confirmation notice will be displayed:



Successful import notice

NOTE

All existing profiles in the application will be deleted and replaced by the compiled profiles imported from the flash drive.

BOSCH operation manual

• Work settings

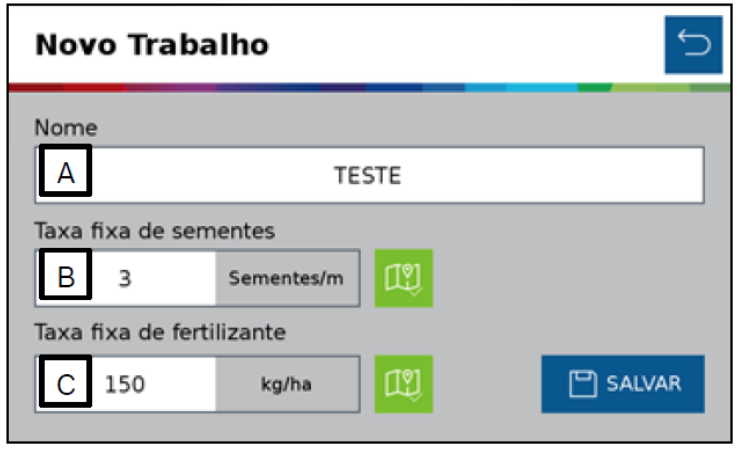
01 - CREATING A FIXED RATE AREA - PART I

To create a flat rate workspace, select the new work button:



New job button

Then the screen below will be displayed:



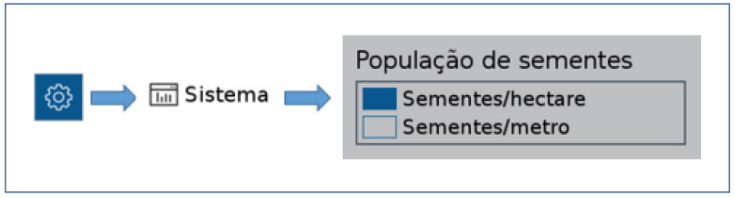
Screen for creating a new job

a) Button to name the new job. When selected, the screen below will be displayed:



Screen for naming a new job

b) Button to define the fixed rate of seed per hectare or seed per meter, depending on how it is set in the system settings:



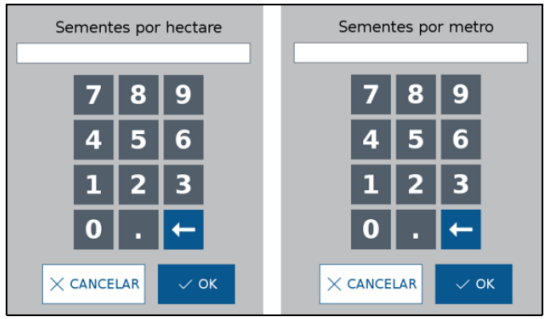
Access to adjust the seeder unit of measure

▪ BOSCH operation manual

• Work settings

01 - CREATING A FIXED RATE AREA - PART II

When selecting the button to set the fixed seed rate, the following screens may appear:



Fixed seed rate adjustment

After adjusting the fixed seed rate value, select the save button.

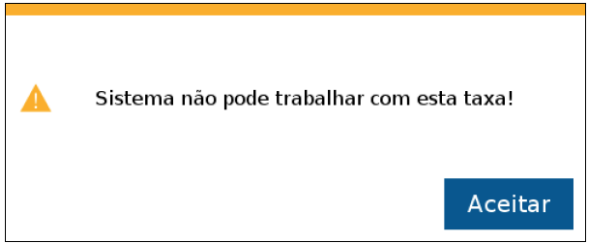
c) Button to define the fixed rate of fertilizer in kg/ha.



Fixed fertilizer rate adjustment

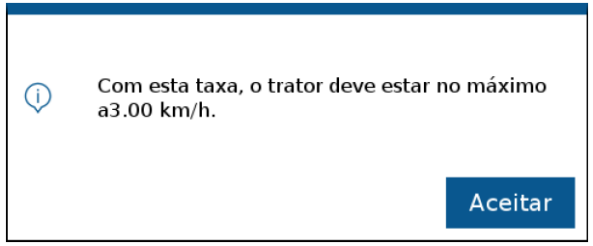
After adjusting the fertilizer flat rate value, select the save button.

The IPS system based on the configuration information will alert if the entered value is outside the allowed limits. In this case, the screen below will be displayed:



Rate warning outside the operating limit

If the fixed rate value entered is close to the upper or lower limit, but still within the allowable range, a warning with the operating speed (maximum or minimum) will be displayed:

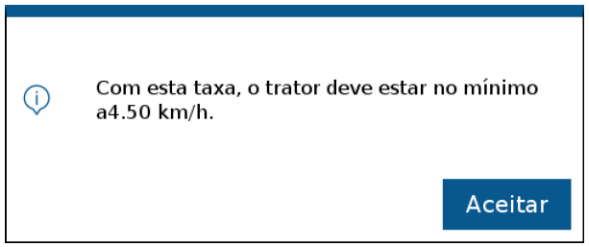


Maximum speed warning example for the adjusted rate value

▪ BOSCH operation manual

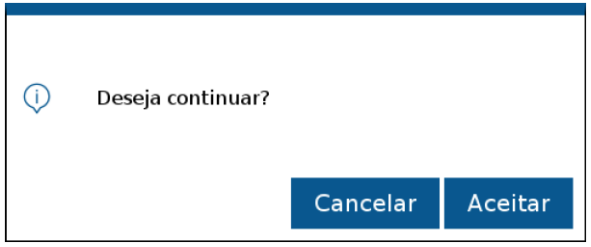
• Work settings

01 - CREATING A FIXED RATE AREA - PART III



Minimum speed warning example for the adjusted rate value

Click on the ”Accept” button and a confirmation notice for creating the new job will be displayed.



Confirmation notice to create new area

This warning will also be displayed when the user enters a rate value that is not close to the maximum and minimum limits allowed by the system. To edit the flat rate value entered, or the name of the area being created, select the “Cancel” button.

▪ BOSCH operation manual

• Work settings

02 - CREATING AREA WITH VARIABLE RATE - PART I

It is possible to create an area with deposition of seeds and fertilizer at a variable rate, where through a prescription map the system adjusts the rate of seeds per meter or kg/ha of fertilizer instantly.

To do this, connect a flash drive to the standard system display, with a prescription map file.

IMPORTANT

It is possible to create a mixed job, variable rate seed and fixed rate fertilizer, or vice versa.
The prescription map should follow the recommendations on page 171. Instructions must be followed.

Analogously to creating a flat rate area, select the new job button (page 133). The user will be directed to the screen to create a new job, (page 133), name the new area that will be created (page 133), select a rate value that the user wants in the fixed rate field for seeds and fertilizer (page 134).

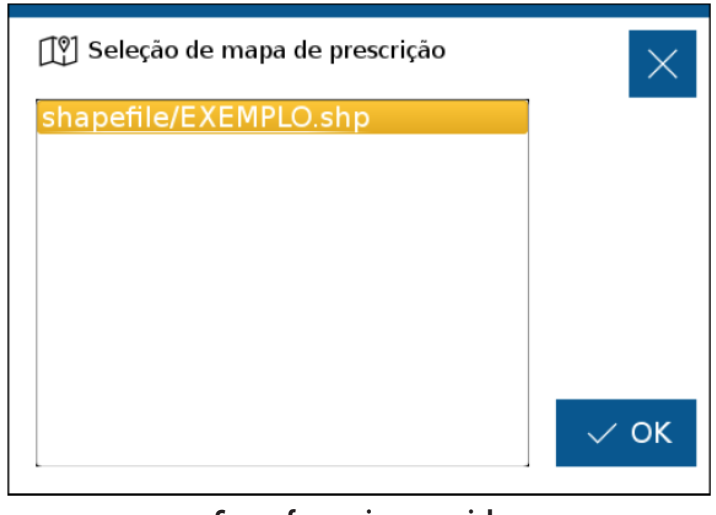
It is necessary to enter the value in the fixed rate field (page 133) as it is possible to change between fixed and variable rate during planting. For example, an area on the map may be zero-rated, but the user wants to deposit seed or fertilizer on it.

NOTE **It is recommended to use the average prescription rate value from the map in the fixed rates field.**



Prescription map button

Then the below map selection screen will be displayed. You can view all seed and fertilizer prescription maps stored on the flash drive. Select the map corresponding to the area being created and the selected field (seeds or fertilizer), then select “ok”.



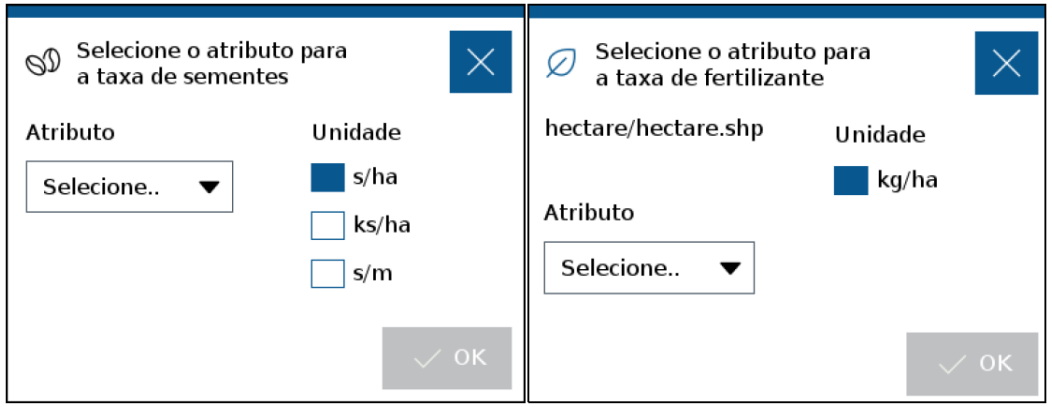
Screen for naming a new job

BOSCH operation manual

• Work Settings

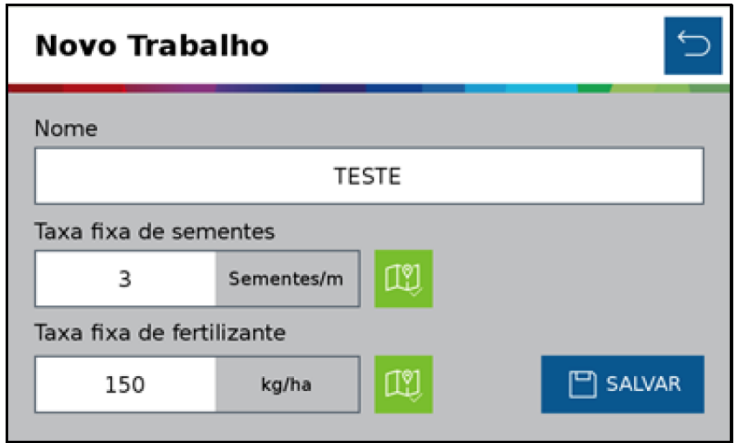
02 - CREATING AREA WITH VARIABLE RATE - PART II

Select “OK” and the screen below will appear. The system will read all the factors inside the shapefile file and list them in the “attribute” field. Select the attribute referring to the seed or fertilizer rate itself. Select, on the side, the rate unit and then the “OK” button.



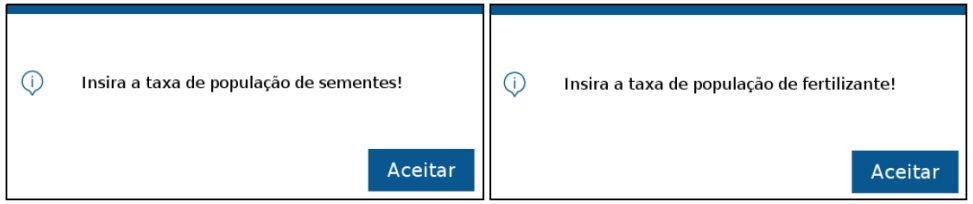
Adjustment of prescription map attributes

The new job screen will display the map icon in green  indicating that the shapefile file has been loaded in the prescription map field. Then select the “Save” button.



Prescription map loaded

If fixed seed or fertilizer rates have not been reported, the following alert will be displayed:



Fixed fee absence alert

The maximum (page 134) or minimum (page 135) speed warning may appear on the screen if the value that has been entered in the fixed rate field is close to the application limits. The confirmation notice (page 135) will be displayed next.

NOTE **At points outside the prescription map, the IPS system will plant with the fixed rate informed in items 3.1 “B” and “C”.**

▪ BOSCH operation manual

• Work settings

03 - CONTINUING A PREVIOUS WORK

The continue job button will be disabled (in gray) if the user turns on the display and does not load any previous job.

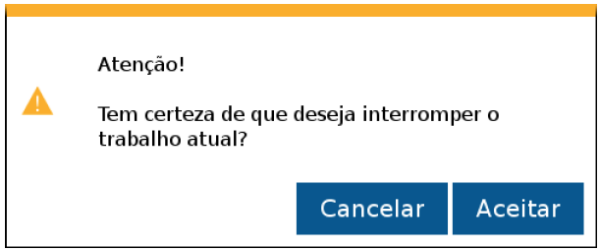


Continue work button disabled

If you have a work in progress and want to return to the home screen, select the “Back” button. The following warning will be displayed:



Back button



Current job interruption notice

NOTE **When leaving the work screen, planting will be interrupted. All engines will be shut down.**

When selecting accept, the user will be directed to the initial screen of operation of the display. If the user wants to return to the work that was in progress, the continue work function will be enabled (in blue) with the name of the area related to the work below.



Continue work button enabled

▪ BOSCH operation manual

• Work settings

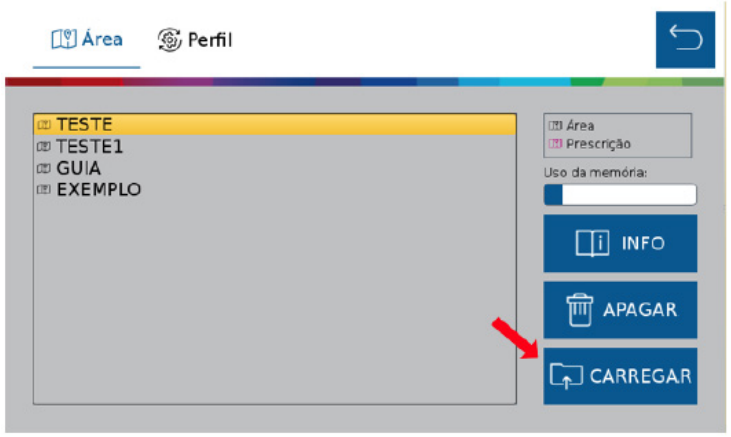
04 - LOADING A PREVIOUS JOB

To load a previous job, the user selects the “Previous Job” button:



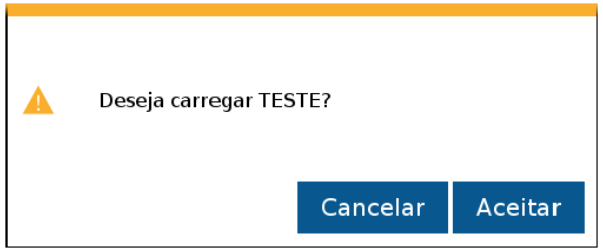
Access to existing areas screen

The screen with all areas saved in the display memory will be displayed. Select the area you want to continue and then press the “Load” button.



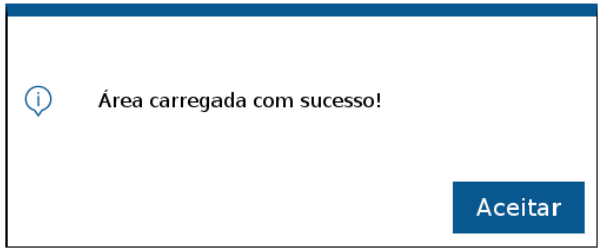
Loading a saved area

The following confirmation prompt will be displayed on the screen, when confirming, the selected area will be loaded.



Confirmation notice for loading selected area

Select “Accept” and the area successfully loaded warning will appear next. Soon after the application will open the work screen.



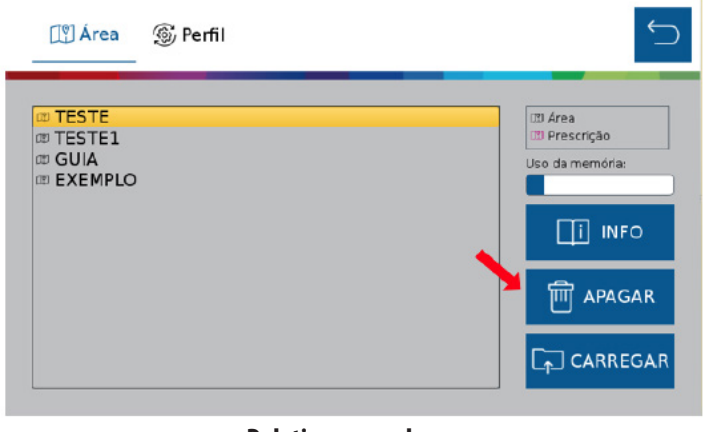
Area loaded successfully

▪ BOSCH operation manual

• Work settings

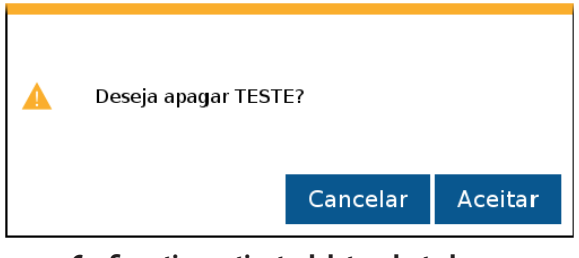
05 - DELETING A PREVIOUS JOB

To delete a previous job, press the ”Previous Job” button (previous page). On the screen with existing areas, select the area you want to delete, and then press the “Delete” button.



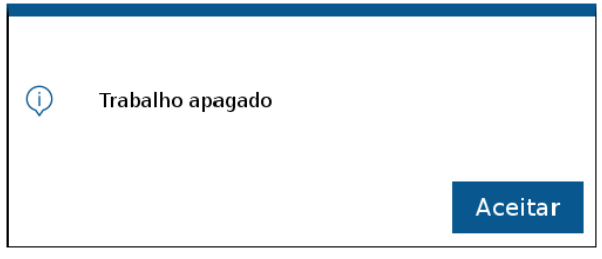
Deleting a saved area

The following confirmation prompt will be displayed on the screen:



Confirmation notice to delete selected area

Select “Accept” and the warning of “Job successfully deleted” will appear next.



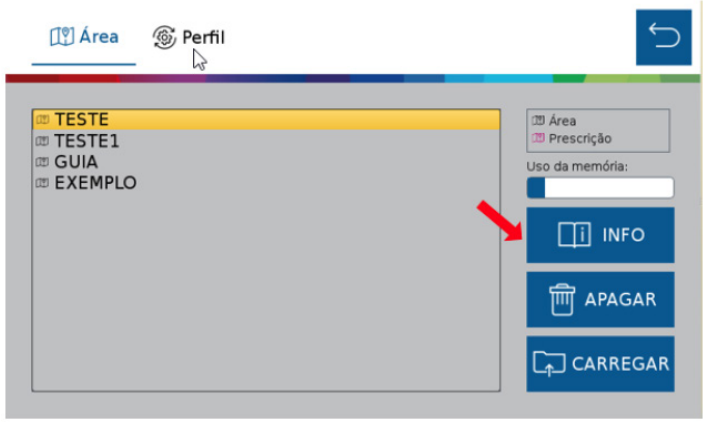
Work notice off

▪ BOSCH operation manual

• Work settings

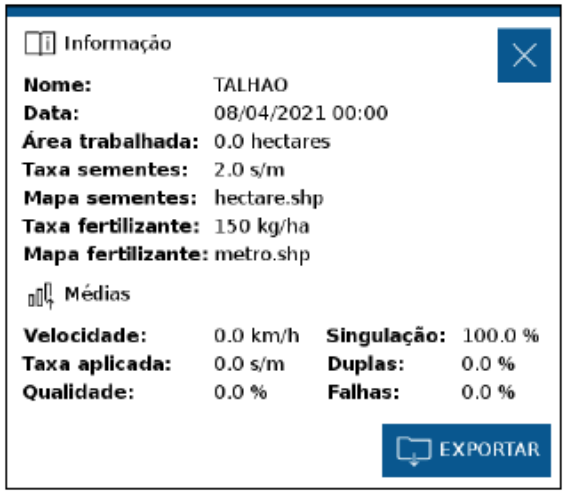
06 - VIEW AND EXPORT THE SUMMARY OF A PREVIOUS JOB

The user can check the summary of data from a previous job. For this, press the previous job button (page 139), on the screen with the existing areas, select the area you want to check the information summary, and then press the “Info” button.



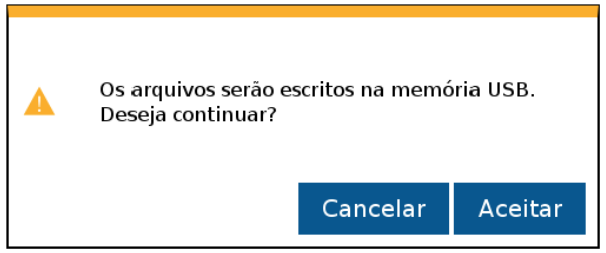
Viewing summary information from a previous job

Then the following frame will appear on the screen:



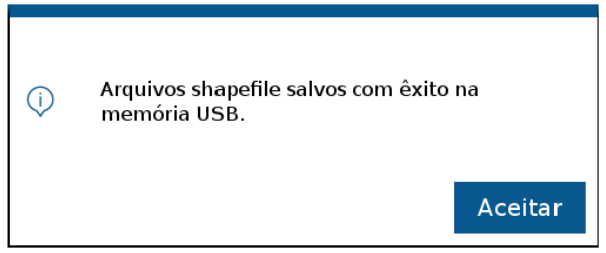
Information board from a previous job

If desired, it is possible to export the area in shapefile file format to a flash drive. When clicking the “Export” button, the following confirmation prompt will be displayed:



Confirmation notice for exporting file data

Press and the following confirmation message will be displayed:



Exported shapefile files

▪ BOSCH operation manual

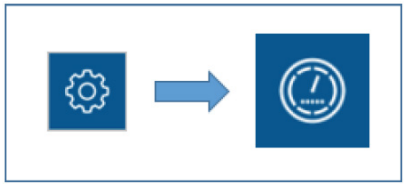
• Tests

01 - ENGINE TESTS - PART I

⚠ ATTENTION

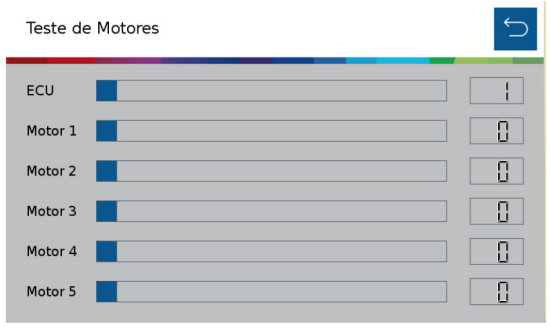
Keep Moving Axes Distance.
Winding on rotating shafts and cardans can cause serious injury or death.
Keep transmission guards in place at all times. Wear appropriate tight clothing.
Shut off engines, ensure that the system is not running, and that the engines are stopped before any adjustments or cleaning of any equipment driven by the IPS system is made.

The application allows testing the motors of each line without the seeder necessarily planting. To do so, select the “Motor Test” button; Access to engine tests screen:



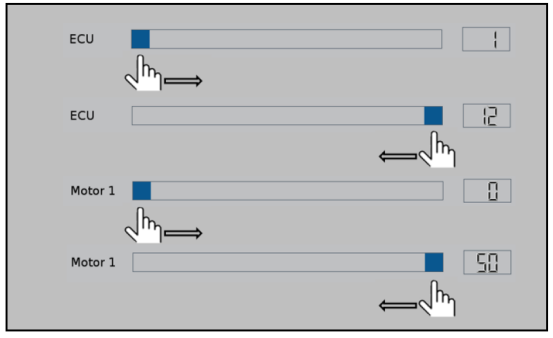
Access to engine test screen

The screen on the side will be displayed, in which there is a bar related to the ECU (module) and five bars related to engines 1, 2, 3, 4, 5 of each ECU (module). Remembering that a module controls up to five motors.



Engine test screen

It is possible to slide the ECU bar (module), to select the desired ECU, this bar varies from 1 to 12 (maximum number of existing ECUs for an application). The bars referring to the motors mean RPM (revolutions per minute), which can be adjusted from 1 to 50 RPM.



Selection of the desired module and RPM on the motors

BOSCH operation manual

• Tests

01 - ENGINE TESTS - PART II

If the user selects a module number that he does not have in his system, the motors will not be powered. For example select module number 3 for an 8-line system (only 2 modules). If the user wants to test the engine on line 13, for example, he will select module (ECU) 3, engine 3.

ECU/SEÇÃO	MOTORES	LINHAS
1	1	1
	2	2
	3	3
	4	4
	5	5
2	1	6
	2	7
	3	8
	4	9
	5	10
3	1	11
	2	12
	3	13
	4	14
	5	15
4	1	16
	2	17
	3	18
	4	19
	5	20
5	1	21
	2	22
	3	23
	4	24
	5	25

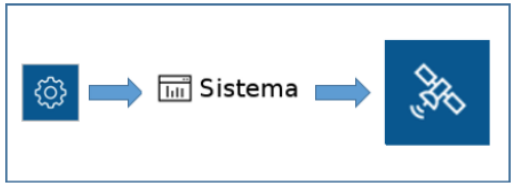
Module, motors and planting lines list

▪ BOSCH operation manual

• Tests

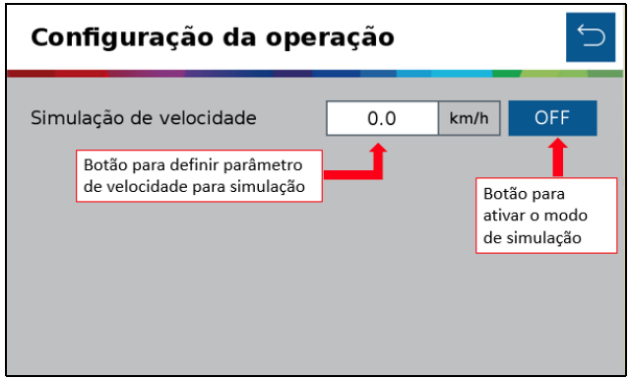
02 - SPEED SIMULATION TESTS

Inevitably, there may sometimes be loss of quality or drop in GPS signal. For these cases there is a speed simulation function:



Access to speed simulation screen

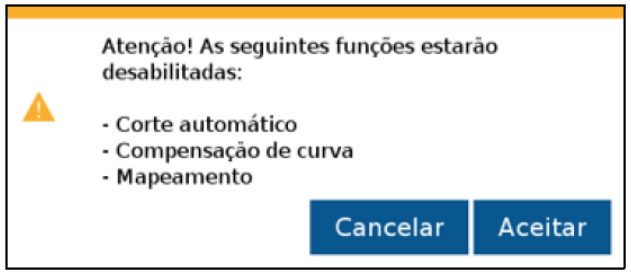
Then the screen below will be displayed:



Speed Simulation Mode Setup Screen

Select the desired speed and start the simulation by selecting the OFF/ON button.

For this function to work, the auto cut, curve compensation and mapping functions will be automatically disabled.



Confirmation to disable functions

NOTE

Operate the tractor at the same speed selected on the operation setup screen. Otherwise, the seed distribution in the soil will not correspond to the configured value and the planting will be irregular.
Speed variations will cause the results displayed on the work screen to be invalid as they will be based on the adjusted simulation speed. Auto-Cutting, Curve Compensation and Mapping functions will be automatically disabled.

▪ BOSCH operation manual

• View of the system in operation

01 - OPERATION STATISTICS - PART I

When in planting operation, on the work screen, the system will display all the lines of the seeder through rectangles with their respective information.

The percentage value informed will be related to the menu that the user has selected (indicated by the light blue color) of the “Menu of functions for visualization”.



Planting screen display lines and functions

The indicators presented by the IPS system in the “Functions menu for visualization” are:

- **Singulation:** Result of calculation performed by IPS to determine if the seeds are being deposited in the ideal spacing.It is calculated by subtracting the ideal condition (100% of the seeds are deposited at exactly the ideal spacing) - the percentage of doubles and failures.
  Singulation = [100% - (% double + % failures)].

- **Double:** Seeds deposited at a distance of less than 50% of the ideal theoretical space/time for the established rate.

- **Failures:** Seeds deposited at a distance of 50% or more of the ideal theoretical space/time for the established rate.

To make these statistics easier to understand, imagine the following situation: a line is planting at a fixed rate of 10 seeds per meter.

Thus, every 10 centimeters a seed must be deposited in the soil, (1 m = 100 cm -> 10 seeds / 1 m = 10 seeds / 100 cm = 1 seed every 10 cm). However, it can happen that 2 seeds are deposited at the same point, or even no seeds are deposited.

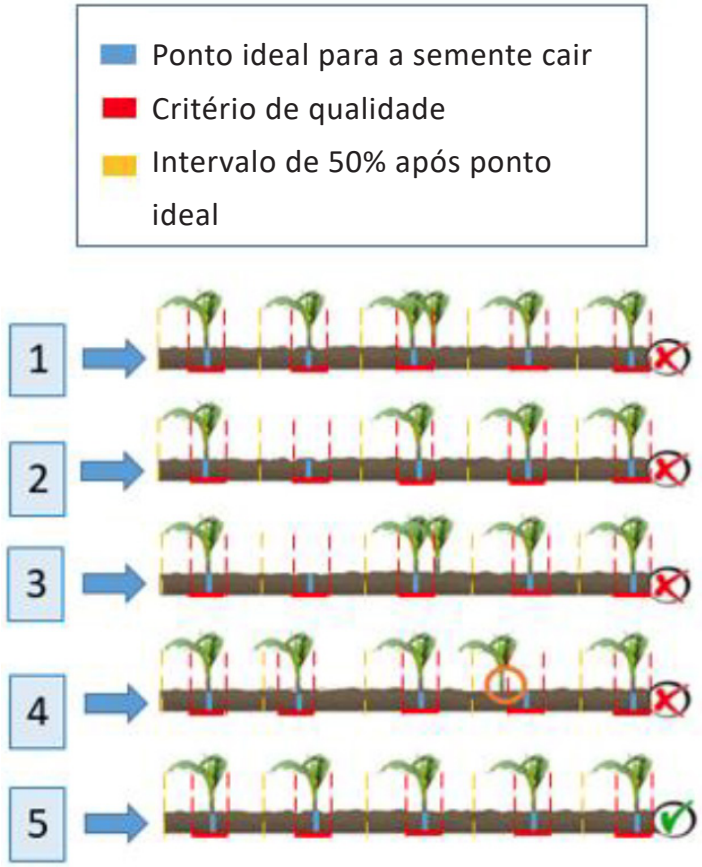
In view of this, it is possible to classify the deposition of seeds of the following ways:

▪ BOSCH operation manual

• View of the system in operation

01 - OPERATION STATISTICS - PART II

The image below exemplifies all these concepts:



Example of cases with failures, doubles, singulation and quality

SITUATION	FAILURES	DOUBLE	SINGULATION	QUALITY
1	0%	20%	80%	100%
2	20%	0%	80%	100%
3	20%	20%	60%	100%
4	0%	0%	100%	80%
5	0%	0%	100%	100%

Relationship between faults, doubles, singulation and quality

- **Quality:** Ratio between seeds being deposited within a range of ± 15% of the optimal space/time for the rate selected by the user. The value of ± 15% can be adjusted following pages 121 to 123.
- **Seeds:** Represents the seed rate deposited for each line.
- **RPM:** Represents the rotation in RPM (revolutions per minute) of each line motor.
- **Fertilizer:** Displays the fertilizer sections and their status.

▪ BOSCH operation manual

• View of the system in operation

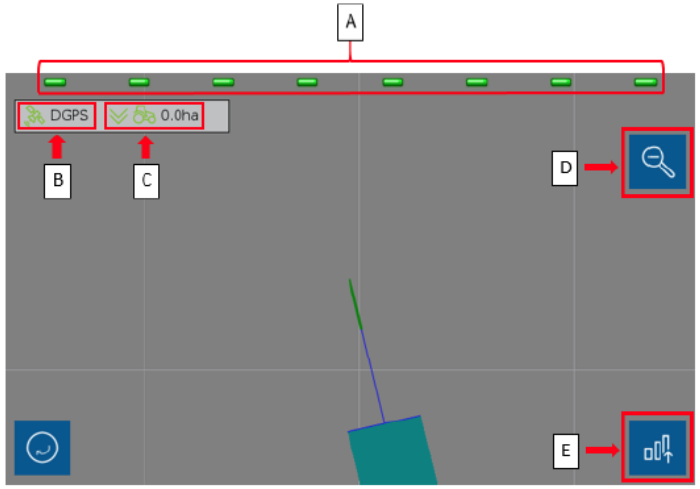
02 - REAL TIME MAP

The system allows the user to follow the planting through a map in real time. To access this map, select the following button on the work screen:



Real-time map button

The screen below will be displayed:



Real time map

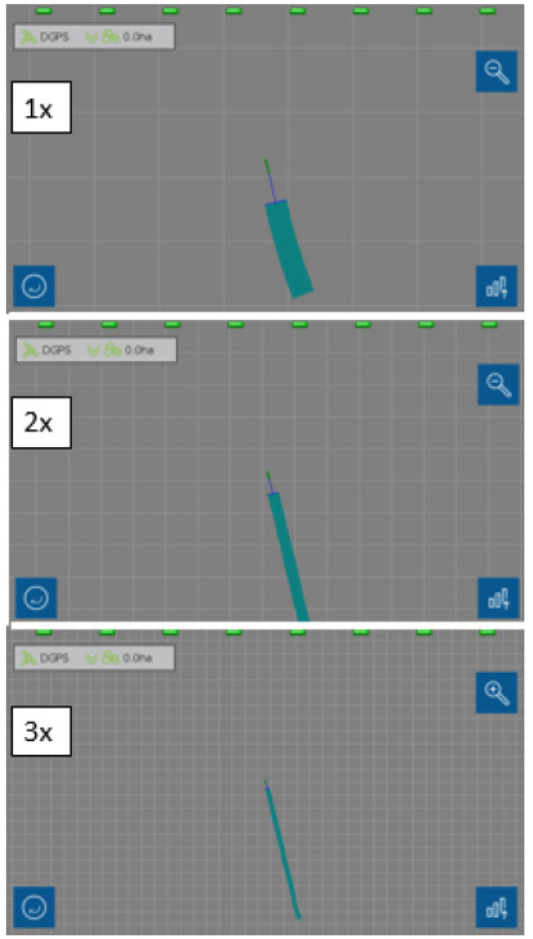
a) Seeder lines, in the example, 8 lines. When in green color, it means it is in operation. When grayed out, it means it is off, such as during auto-crop.

b) GPS signal status, when red, means no signal.

c) Sum of the area that has already been planted and indicator of the seeder lift sensor status.

d) Zoom out button.

e) Button to return to the operation statistics screen.



Real-time map with zoom out

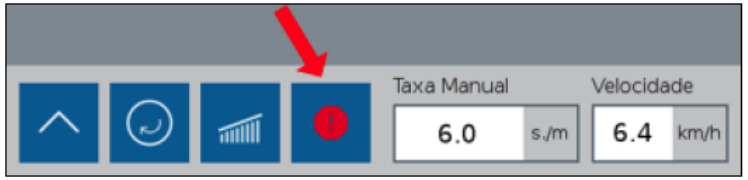
▪ BOSCH operation manual

• View of the system in operation

03 - LINES FILTER WITH ERROR OR LOW STATISTICS - PART I

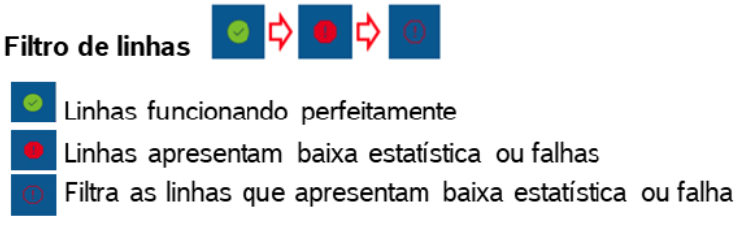
This filter displays on the IPS screen only the lines that have low statistics or errors. Recommended for very large seeders, where it is not possible to see all the lines at the same time on the IPS work screen.

When the alert button below is in red color, it means that some line has low statistics or errors.



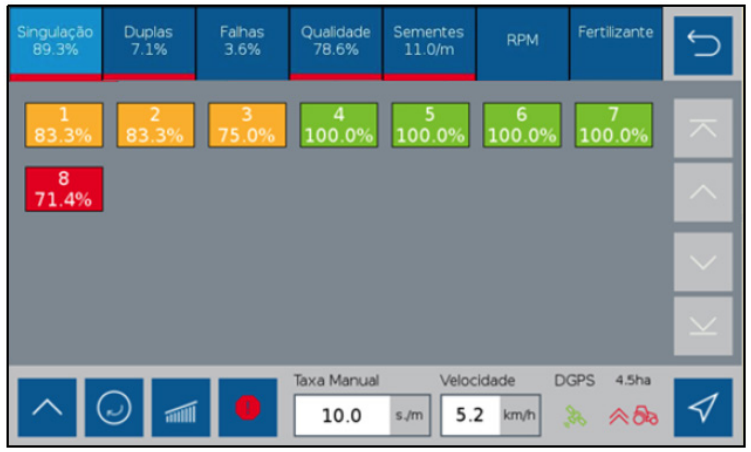
Fault alert/filter button

When selecting this button, the screen will only show the lines that have the statistics below the lower limit, selected value (page 119), and the lines that present any type of fault (such as seed or motor).



Alarm filter button sequence

For example in the screen below, we can see that line 8 has singulation values below the stipulated (page 119), so its color is red and the line filter symbol is solid red:



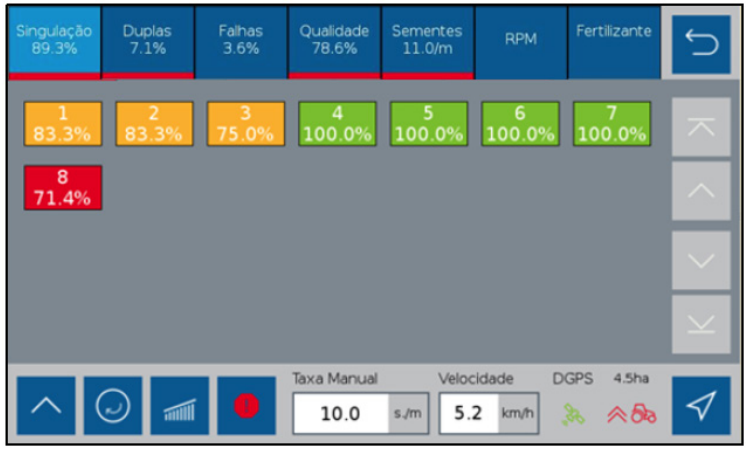
Application screen before applying filter

▪ BOSCH operation manual

• View of the system in operation

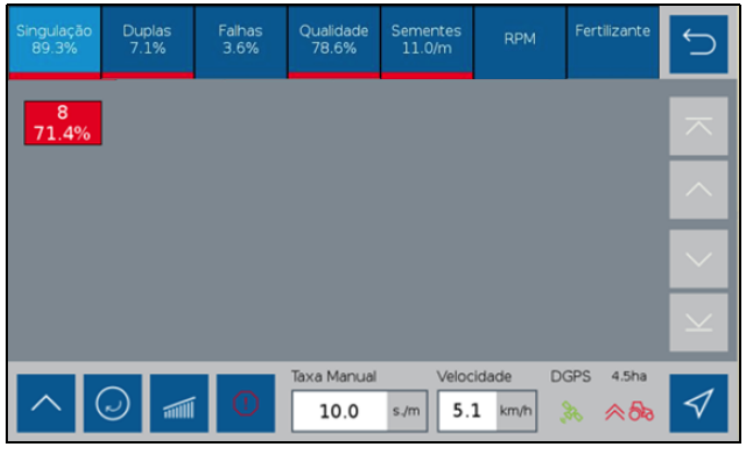
03 - FILTER OF ERROR OR LOW STATISTICS LINES - PART II

For example in the screen below, we can see that line 8 has singulation values below the stipulated (page 119), so its color is red and the line filter symbol is solid red:



Application screen before applying filter

When selecting the alert filter button, only this line should appear on the screen and the line filter symbol changes color to red and blue. As shown in the screen below:



Application screen with applied line filter

NOTE Check the reason for the low stat or failure before proceeding with planting (pages 159 to 165).

BOSCH operation manual

• View of the system in operation

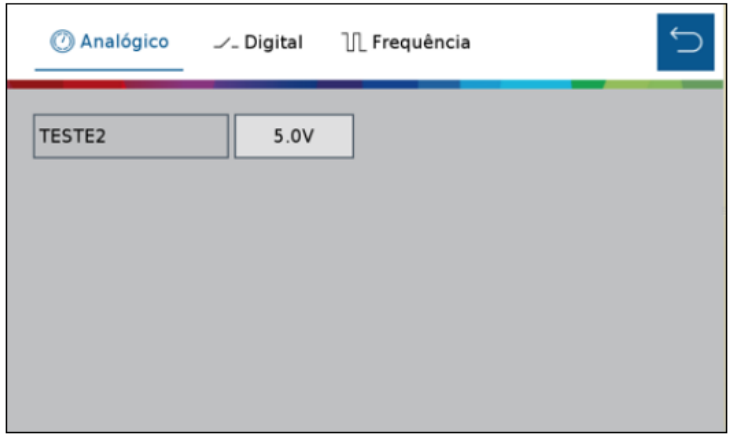
04 - VIEWING ADDITIONAL SENSORS

You can view the status of sensors added to the system. To view additional sensors, select the following button on the work screen:



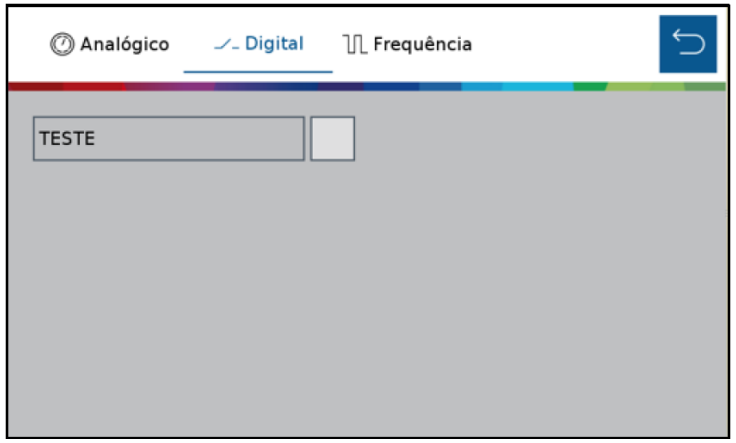
Path to view additional sensors

Then the screen below will be displayed:

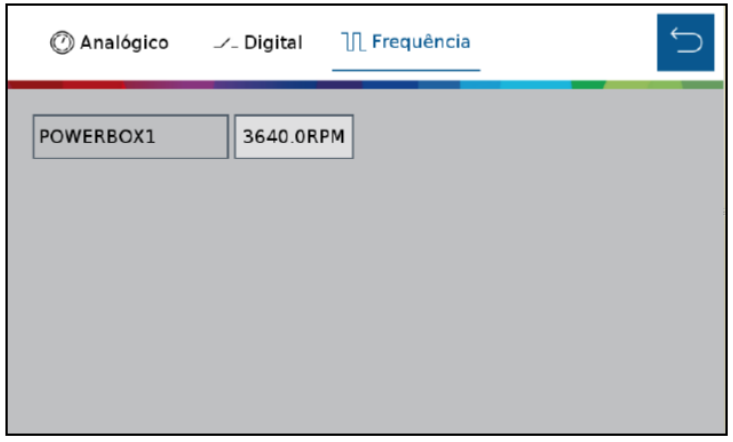


Loading a saved area

It is possible to change the visualization section if the sensor added is analog, digital or frequency. The images below show the other digital and frequency sensor visualization screens:



Added digital sensor preview



Added frequency sensor preview

BOSCH operation manual

• View of the system in operation

05 - GNSS SIGNAL STATUS

The status of the GNSS signal will be signaled on all work screens.



GNSS status indication

The GNSS signal status will be green when the GNSS signal is recognized and the description of the signal type, DGPS (uncorrected signal) or RTK (corrected signal) will be displayed in the icons below.



Recognized GPS signal status

If the system does not recognize the GNSS signal, an alert message will be displayed to the user (page 159) and it will also be signaled, as shown in the following image:



No GNSS signal

In case of loss of the GNSS signal, it is possible to follow the planting through the speed simulation (page 144).

BOSCH operation manual

• View of the system in operation

06 - STATUS OF THE LIFT SENSOR

Lift sensor status will be flagged on all desktop screens



Lift sensor status indication

The **up arrow and the red tractor** mean the implement is up.
The **down arrow and the green tractor** mean the implement is lowered.



Seeder lift sensor indication

If the indicator does not represent the actual position of the seeder, check the configuration (page 107) and the wiring and sensor status.

▪ BOSCH operation manual

• View of the system in operation

07 - TRACTOR SPEED

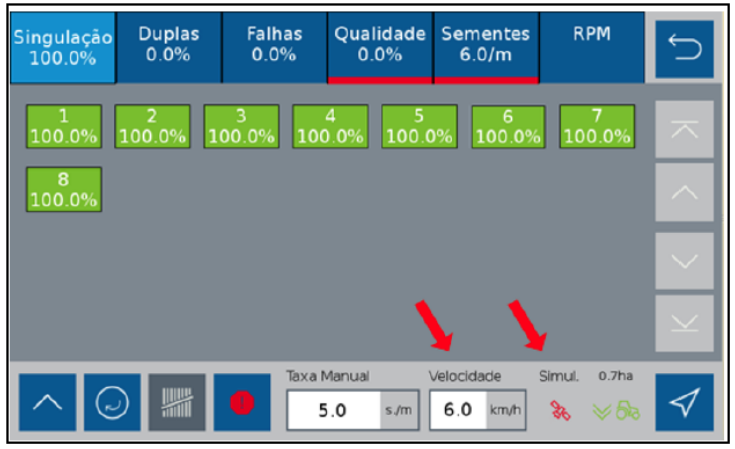
The window with the tractor speed signaling is shown on the screen below:



Tractor speed indicator

When the GNSS signal is quality (page 151), the speed displayed on the screen will be the speed collected from the GNSS antenna. If the signal is lost, you can simulate the travel speed (page 144).

During the simulation, the displayed speed is not the actual travel speed, but the speed selected by the user (page 144). In this case the GNSS signal status symbol (page 151) will change to red with the abbreviation "Simul." above the same.



Speed indication in speed simulation mode

NOTE

Operate the tractor at the same selected speed (page 144). Otherwise, the seed distribution in the soil will not correspond to the configured value and the planting will be irregular.
Speed variations will cause the results displayed on the work screen to be invalid as they will be based on the adjusted simulation speed.
Auto-Cutting, Curve Compensation and Mapping functions will be automatically disabled.

BOSCH operation manual

• System functions in operation

01 - ENABLE/DISABLE AUTOMATIC LINES CUTTING

To enable automatic line-by-line cutting, the user must select the following button:



Cut enable/disable button

CUTTING BUTTON	STATE
	Auto cut on.
	Auto cut off.
	Auto cut off due to loss of GPS signal correction or speed simulation mode on.

Cut function

When activated, the auto cut will disconnect the lines in case of overlap and reconnect them automatically. For correct use of the system see page 166.

NOTE | **For the correct functioning of the system, the automatic cut calibration must be performed as described on pages 124 to 127.**

▪ BOSCH operation manual

• System functions in operation

02 - PROCEDURE TO LOAD THE SEED DISK

The disc loading function is used when planting is started for the first time or stopped during work and the vacuum turbine is turned off. This function drives the electric motors for one turn, causing the holes to be filled with seeds. For correct operation, the vacuum turbine must be activated and the vacuum pressure must be that recommended by the seeder manufacturer.



Disc loading button

After selecting the button to load the disks, the motors will be activated for a complete turn of the disks, during the process the button will change to the image below, and when finished it will return to the state above.



Disc loading button pressed

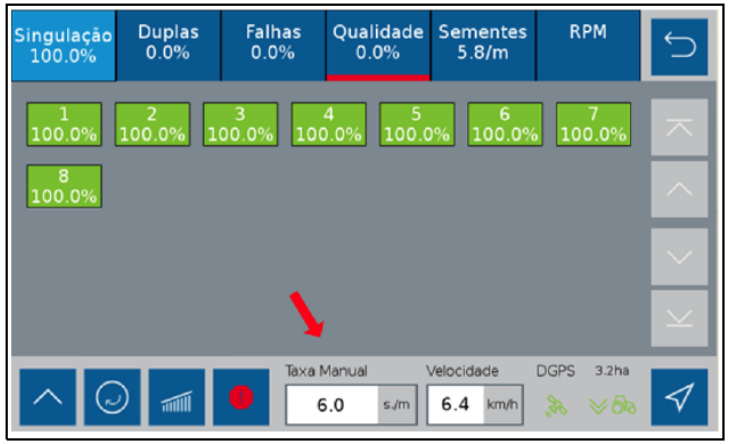
BOSCH operation manual

• System functions in operation

03 - CHANGE OF THE FIXED RATE

During planting, you can change the fixed seed application rate. The fixed rate value can be configured with the unit of seeds per hectare [s/ha] or seeds per meter [s/m], according to page 133.

To change the fixed rate, select the following button on the work screen:



Flat rate change button

Afterwards, the following screen will be displayed:



Fixed rate adjustment in operation

Enter the new flat rate and select OK.

▪ BOSCH operation manual

• System functions in operation

04 - ENABLE/DISABLE VARIABLE RATE MODE

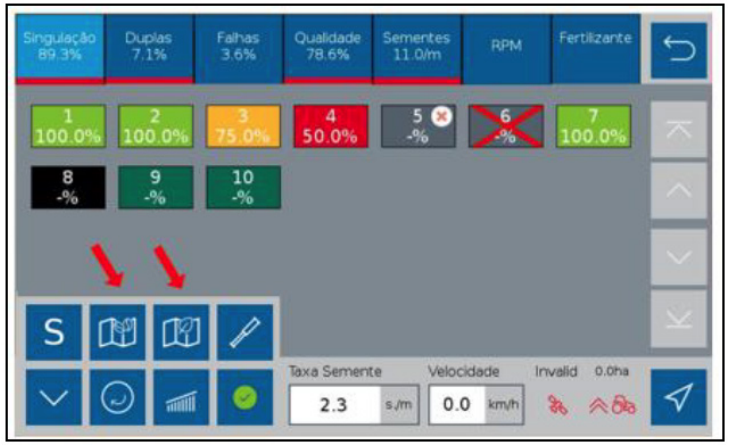
It is possible to switch between variable rate and fixed rate of seed or fertilizer deposition during work.

In variable rate mode, the system will apply a seed or fertilizer rate following the prescription map selected in the IPS system, see page 136. In fixed rate mode, the amount of seeds and fertilizer is the same for the entire area, see page 133.

To switch between modes while working, open the additional work screen menus by clicking the following button:

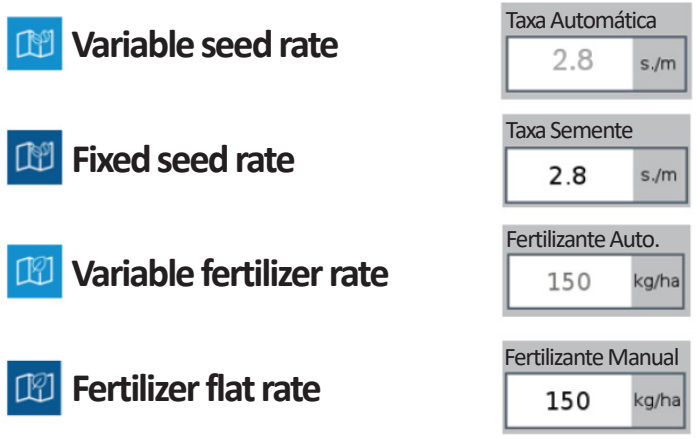


Additional menus button



Additional menus

Switch between modes by clicking on the buttons indicated above. Confirmation of the mode change is by changing the color of the button and the text above the rate display.



Variable rate and fixed rate view

▪ BOSCH operation manual

• System functions in operation

05 - CURVE COMPENSATION

During planting, the IPS system identifies the maneuvers in the tractor's curve and performs the adjustment of seed deposition automatically, line by line, so that the seed rate remains the same both on the inside, shorter horizontal displacement distance, when outside the seeder, greater horizontal displacement distance.

No operator action is required and the system operates automatically and constantly as long as there is a GNSS signal available, see page 151.

In order for it to function correctly, perform the settings on pages 104, 105 and 106 in a precise manner.

• Alerts

01 - SYSTEM ALERTS

The IPS system controls the status of its components and the seeder manufacturer's subsystems (opening and closing and pneumatic springs), emitting audible and visual signals in case of error or parameters outside the specified range.

NOTE | **Always check the root cause of errors emitted by the IPS system. Ignoring errors and warnings can cause material, physical and/or damage to the planting quality.**

▪ BOSCH operation manual

• Alerts

02 - FAULTS AND SOLUTIONS - PART I

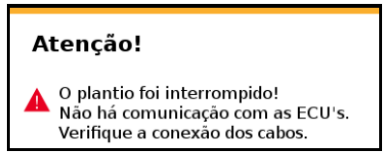
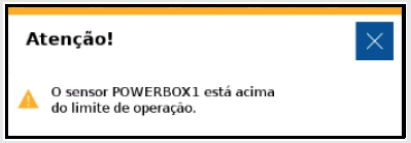
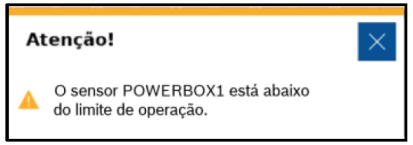
If the IPS system has a malfunction, check the probable causes and solutions. If the suggested corrections are not enough, contact the seeder manufacturer's Authorized Service.

IPS SYSTEM		
FAULT / ERROR	**CAUSE**	**SOLUTIONS**
Seed tube error. 	Lack of seeds in the batcher.	Check the seed tube. Check line vacuum.
	Clogged down tube.	Unclog the down tube.
	Incorrect reading.	Clean the seed sensor. Align the seed sensor. Check the wiring.
Engine error.  **ALWAYS CHECK THE ENGINE BEFORE CLEARING THE ERROR.** **RISK OF PERMANENT DAMAGE TO THE SYSTEM.** Click on the line icon to restart the engine.	Resistance in the batcher.	Disassemble and clean the batcher. Apply graphite to the disc. Adjust the singulator and extractor. Check motor and batcher alignment. Check that there is no contact between the motor shaft and the batcher.
	Incorrect reading.	Check wiring integrity. Check the connectors for foreign objects.
ECU connection error.	No 12V power supply.	Turn on the PowerBox main switch. Check wiring integrity. Check tractor battery voltage.

▪ BOSCH operation manual

• Alerts

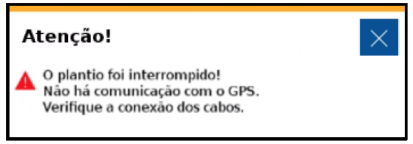
02 - FAULTS AND SOLUTIONS - PART II

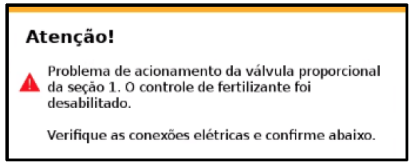
IPS SYSTEM		
FAULT / ERROR	**CAUSE**	**SOLUTIONS**
	Connection interruption.	Check the connection of the WH:TRACTOR/SEEDER cables. Check the ECU cable connection. Check wiring integrity. Check the connectors for foreign objects.
High Rotation Power Box.  **Optimal PowerBox rotation from 6000~6500 RPM to 2000 RPM of tractor engine.**	High flow hydraulic system.	Check tractor hydraulic flow adjustment.
Low RPM Power Box.  **Optimal PowerBox rotation from 6000~6500 RPM to 2000 RPM of tractor engine.**	Low flow hydraulic system.	Check hose connection. Check tractor hydraulic flow adjustment.
	Belt breakage.	Check the root cause of the break and change the belt.
	Loosening the alternator nut.	Check the root cause of the loosening.

▪ BOSCH operation manual

• Alerts

02 - FAULTS AND SOLUTIONS - PART III

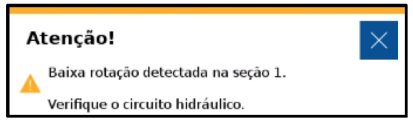
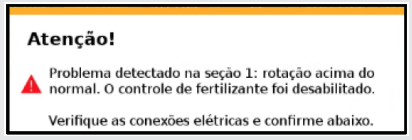
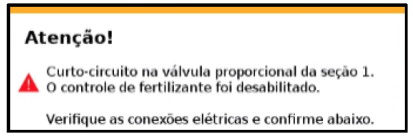
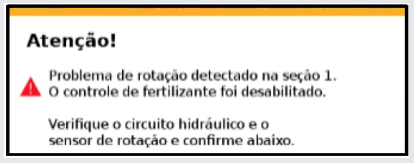
IPS SYSTEM		
FAULT / ERROR	**CAUSE**	**SOLUTIONS**
GPS communication failure. 	Disconnect RS-232 converter.	Check that the RS-232 converter LED is green. Check the converter pin connection.
	Connection interruption.	Check that the WH:TRACTOR cable is connected to the tractor's GPS antenna. Check if Fuse F1, F2 or F3 is not blown in WH: TRACTOR.
	Incorrect GPS setup.	Check antenna setup Rate: 38400kps. Messages NMEA: GGA, VTG Frequency: 10Hz

FERTILIZER SUBSYSTEM		
FAULT / ERROR	**CAUSE**	**SOLUTIONS**
Proportional valve error. 	Connection interruption.	Check wiring integrity. Check the connectors for foreign objects.
	Solenoid valve failure.	Check the operation of the solenoid valve.

▪ BOSCH operation manual

• Alerts

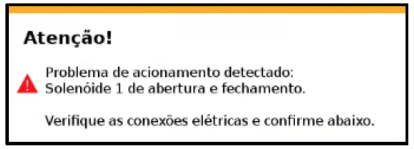
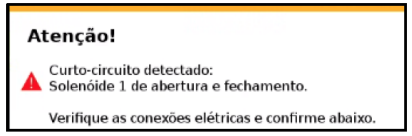
02 - FAULTS AND SOLUTIONS - PART IV

FERTILIZER SUBSYSTEM		
FAULT / ERROR	**CAUSE**	**SOLUTIONS**
Low fertilizer rotation. 	Low flow hydraulic system.	Check hose connection. Check tractor hydraulic flow adjustment. Check operation of hydraulic motor solenoid.
	Solenoid valve failure.	Check operation of hydraulic motor solenoid.
Rotation above normal. 	Connection interruption.	Check wiring integrity. Check the connectors for foreign objects.
	Solenoid valve failure.	Check valve operation.
	High flow hydraulic system.	Check tractor hydraulic flow adjustment.
Short proportional valve 	Connection interruption.	Check valve electrical connections. Check valve wiring.
Fertilizer rotation error 	Incorrect hydraulic flow.	Check hose connection. Check the operation of the hydraulic motor solenoid.
	Reading error.	Check the integrity of the rotation sensor wiring. Check the connectors for foreign objects.

▪ BOSCH operation manual

• Alerts

02 - FAULTS AND SOLUTIONS - PART V

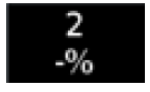
OPENING AND CLOSING SUBSYSTEM		
FAULT / ERROR	**CAUSE**	**SOLUTIONS**
Opening and closing error 	Connection interruption.	Check wiring integrity. Check the connectors for foreign objects.
	Erro solenoide.	Check solenoid operation.
Short opening and closing 	Connection interruption.	Check wiring integrity. Check the connectors for foreign objects.
	Solenoid error	Check solenoid operation.

▪ BOSCH operation manual

• Alerts

03 - ALERTS AND STATISTICS

During work, the IPS system communicates the status of the planting lines through colors and alerts, which are described in the table below:

LINE ICON	STATE
	Line without statistics data, planting just started, the system has not yet counted enough seeds to update the statistics.
	Thread disconnected automatically by automatic thread trimming. See pages 116 to 119.
	Line with good indicator value, according to the adjusted values in the statistics settings. See pages 111 and 112.
	Line with intermediate indicator value, according to the adjusted values in the statistics settings. See pages 111 and 112.
	Line with bad indicator value, according to adjusted values in statistics settings. See pages 111 and 112.
	Line disconnected manually by operator.
	Engine error. See pages 150 to 155.
	Seed tube error. See pages 150 to 155.

BOSCH operation manual

• Alerts

04 - SOUND ALERTS

The table below is related to the IPS system audible alerts.

PRIORITY	DEVICE	POP-UP	TRIGGERED BY	JOURNAL	BUZZER TYPE	ALERT	RECURRENCE
Occasional	ECU	X	Fix ECU communication error.		Short	ECU signal ok.	Only once.
Critical	ECU	X	ECU CAN BUS no messages.	X	Long	No signal ECU CAN BUS.	As long as the error is active.
Critical	GPS	X	GPS without signal.	X	Long	No GPS signal.	As long as the error is active.
Occasional	GPS	X	GPS signal level less than 4.		Long	Bad GPS signal.	Only once.
Occasional	GPS	X	GPS correction signal error.		Short	GPS signal ok.	Only once.
Critical	GPS	X	GPS CAN BUS without messages.	X	Long	No signal ECU CAN BUS.	As long as the error is active.
High	Engine		“Engine Error” message.	X	Long	Engine error.	As long as the error is active.
High	Seed line		Red box of doubles.		Short	Double seed line out of range	Only once.
High	Seed line		Red box for failures.		Short	Seed line faults out of range.	Only once.
High	Seed line		Red box for singulation.		Short	Seed line singulation out of range.	Only once.
High	Seed line		Red box for quality.		Short	Seed line quality out of range.	Only once.
High	Seed line		Offset		Short	Line of double seeds out of range.	Only once.
High	Seed line		Received “Seed Tube Error” message.		Long	Seed tube blocked.	Only once.

▪ BOSCH operation manual

• Procedures

01 - USE OF AUTOMATIC CUTTING

The automatic mowing function automatically and individually switches off the electric motors that are in a previously planted area. The function was developed to facilitate the planting process and avoid overlapping seeds, saving inputs and optimizing planting.

NOTE | **Always use the auto-cut function during planting, see page 154.**

Below are situations in which the auto cut function is activated.

02 - SIDE MANEUVER

During planting, it is often necessary to perform maneuvers to avoid obstacles such as trees and posts. When carrying out the maneuver towards the already planted area, the system automatically deactivates the engines and ensures that the seeds do not overlap. When the machine returns to the correct path, the motors are automatically restarted.

03 - CROSSING BOUNDARY

For the automatic cutting system to act on the borders, they must be previously planted using the IPS system.

04 - CROSSING THE PLANTING BOUNDARY

When crossing the border during planting, the system will turn off the motors as they enter the already planted region, the indicators on the work screen will change to dark green, see page 164.

NOTE | **Keep seeder down and planting at constant speed until all work screen indicators change color. Instructions must be followed.**

05 - CROSSING THE BOUNDARY MANEUVERING

To plant again after crossing the border, or at the beginning of planting, the motors will restart as they enter the region that has not yet been planted. The indicators on the work screen will change from dark green color to the previous color, see page 164.

NOTE | **Keep seeder down and planting at constant speed until all work screen indicators change color. Instructions must be followed.**

06 - RESUME PLANTING WITH MACHINE STOPPED

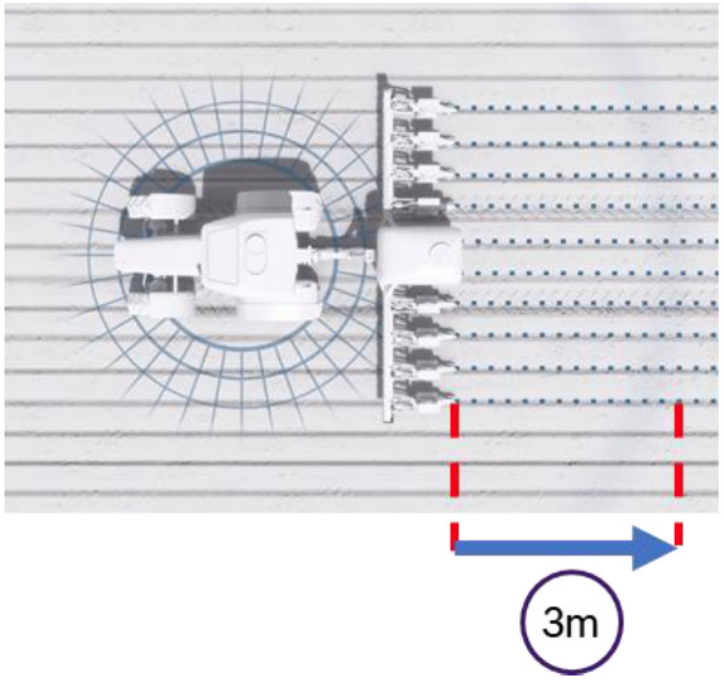
If planting is interrupted, follow the instructions below to ensure the best performance:

▪ BOSCH operation manual

• Procedures

07 - RESUME PLANTING IN THE MIDDLE OF A PASS

Raise the seeder and perform a maneuver in reverse for at least 3m to obtain a good result (figure below). Start forward movement to planting speed while lowering the seeder, keep the speed constant. The system will calculate the exact moment to restart the motors to obtain a planting without overlaps or failures.



Resuming planting in the middle of a stride

08 - RESUME PLANTING IN THE MIDDLE OF THE HEADLINE

Raise the seeder and perform a maneuver in reverse gear of at least 3m to obtain a good result. Start forward movement to planting speed while lowering the seeder, keep the speed constant. The system will calculate the exact moment to restart the electric motors to obtain planting without overlaps or failures.

09 - RESUME PLANTING WITH VACUUM LOSS

If there is a loss of vacuum, stop the seeder and carry out the necessary inspection and maintenance. To resume planting, use the Disc Fill function, detailed on page 155, and then resume planting as shown in the picture.

10 - MANEUVER PROCEDURE DURING PLANTING

In the case of curves and around obstacles such as poles and trees, the system will maintain the uniform spacing between the seeds and perform the automatic shutdown of lines if the function is activated, see pages 154 and 158.

▪ BOSCH operation manual

• Procedures

11 - INSTALLING THE POWERBOX - WARNINGS

Pay attention to the recommendations for installing the PowerBox and the minimum requirements of the tractor for the correct functioning of the system. Installation must be performed by trained personnel and following guidelines to avoid personal and property damage.

⚠ ATTENTION

Make sure there is no oil flow before connecting or disconnecting the hydraulic hoses. Failure to check before connecting or disconnecting hoses to the VCR could result in personal injury or equipment damage.

Avoid possible physical injury. Disconnect the ground (-) cable from the battery before any electrical repairs.
Do not modify, add or replace PowerBox components with non-genuine items.

Safe Battery Handling.
CAUTION: Gas contained in the battery may explode. Keep sparks and flames away from batteries. Use a flashlight to check the battery's electrolyte level. Never check battery charge by placing a metal object across the poles. Use a voltmeter.
Always remove the ground (-) clamp from the battery first and reconnect it last.
Sulfuric acid from battery electrolyte is poisonous and strong enough to burn skin, poke holes in clothing, and cause blindness if splashed in the eyes.

AVOID RISKS:

- **Charging batteries in a well-ventilated area outside the PowerBox.**
- **Wearing eye protection and rubber gloves.**
- **Avoiding the use of air pressure to clean the batteries.**
- **Avoid breathing the gases when adding electrolyte to the battery.**
- **Avoid spilling or dripping the electrolyte.**

IF ACID SPLASHES ON SKIN OR IN EYES:

1. **Wash the skin with running water.**
2. **Apply baking soda or lime to the affected area to neutralize the acids.**
3. **Flush eyes with water for 15-30 minutes.**
4. **Seek medical assistance immediately.**

IN CASE OF ACID INGESTION:

1. **Do not induce vomiting.**
2. **Seek medical assistance immediately.**

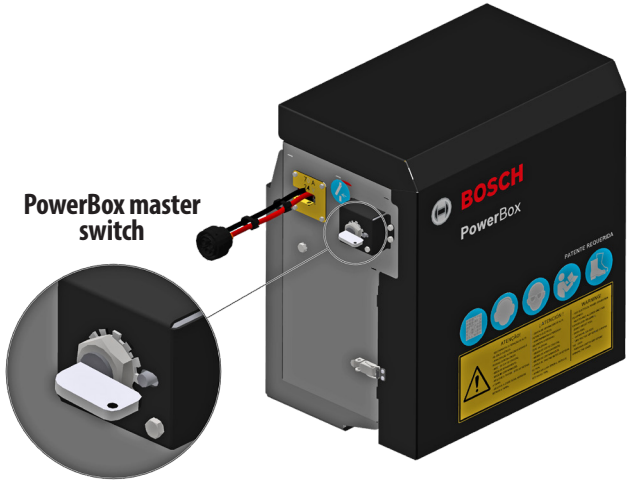
BOSCH operation manual

• Procedures

12 - INSTALLING THE POWERBOX - ELECTRICAL SYSTEM

The PowerBox is responsible for generating and storing electrical energy for the IPS system's motors, after using the IPS system, remember to turn off the PowerBox's main switch (figure below). An audible alert will be emitted by the PowerBox in the following cases:

- IPS screen on and PowerBox main switch off.
- IPS screen off and the main switch on.



⚠ ATTENTION

Use two identical 12V 45 Ah or 50 Ah automotive batteries that must be purchased directly by the seeder owner. Baldan does not supply these batteries with the seeder.

❗ IMPORTANT

Do not make electrical connections to the PowerBox batteries.
Avoid shorts, always disconnect the negative cable from the batteries when servicing any PowerBox components.
Do not carry out load transfer. Opt for the slow charge of the batteries.
Do not mix different battery brands, models or specifications in the PowerBox.

⚠ ATTENTION

Avoid possible physical injury. Disconnect the ground (-) cable from the battery before any electrical repairs.
Do not modify, add or replace PowerBox components with non-genuine items.

▪ BOSCH operation manual

• Installation

01 - INSTALLING THE POWERBOX - HYDRAULIC SYSTEM

The PowerBox depends on the tractor's hydraulic system to generate electrical energy through a hydraulic motor and an alternator. Pay attention to the tractor's minimum specifications required for the correct functioning of the system.

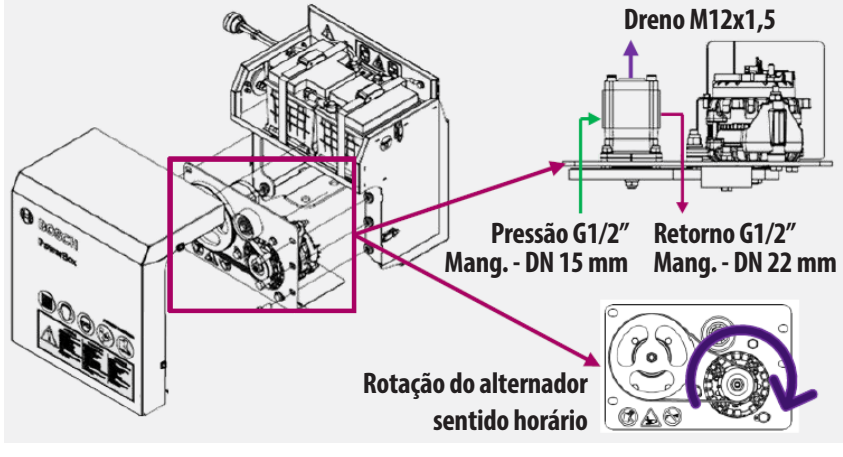
Minimum hydraulic system specifications:

COMPONENT	SPECIFICATION
Tractor hydraulic flow.	Minimum 20 LPM.
Maximum operating pressure.	250 bar.
Hydraulic connections.	1 VCR (connection to the hydraulic block) with float function.
Pressure hose.	G1/2" DN 15 mm.
Return hose.	G1/2" DN 22 mm with free flow.
Drain hose.	M12 x 1.5 with free flow.

Hydraulic system specifications

Minimum specifications for the tractor:

- Priority streaming, floating VCR, free-to-tank return with free-flow connectors.



⚠ ATTENTION

Make sure there is no oil flow before connecting or disconnecting the hydraulic hoses. Failure to check before connecting or disconnecting hoses to the VCR could result in personal injury or equipment damage. Indicates a hazardous situation in which the user must proceed as noted.

⚠ ATTENTION

Maximum pressure 250 bar.
Connect the drain directly to the tractor's free return. See tractor manual. Do not connect the drain to the motor return. Risk of component damage.
When turning off the PowerBox engine use the VCR float function.

▪ BOSCH operation manual

• Installation

02 - INSTALLATION OF THE GNSS ANTENNA

The installation of the GNSS antenna must be carried out following the recommendations of the equipment manufacturer's installation manual. For greater accuracy of the IPS system, it is recommended to install the GNSS antenna as far forward as possible from the tractor's rear axle, following the center line of the equipment.

03 - SPECIFICATIONS, FLASHDRIVE AND FILES

For the correct functioning of the system, use quality pendrives and meet the demands of the following files.

IMPORTANT | **For the first use of the pendrive, it must be formatted in FAT32 and have a maximum capacity of 32 Gb. Use a dedicated USB flash drive for data transfer.**

TOPIC	SYSTEM
Name files shp, dbf, shx.	All files must have the same name without special characters.
Multiple files on one flash drive.	Yes. It is not necessary to save files common to an area in compressed folders.
Maximum number of files.	Maximum permissible memory.

Prescription files specifications

04 - CONFIGURATION OF SEEDER DIMENSIONS ON AUTOPILOT

The correct configuration of the dimensions of the seeder on the tractor's autopilot is essential for the functioning of the IPS system. Informing widths different from the useful width of the seeder or the presence of misalignments between the tractor / seeder can lead to a malfunction of the cut and the system in general. Tractor and seeder dimension settings must be made as per pages 104 and 105.

▪ BOSCH operation manual

• Care and Maintenance - Part I

Safe maintenance practice:

⚠ **Understand the maintenance procedure before performing any work. Keep the work area clean and dry.**

⚠ **Never lubricate, adjust or service the machine while it is in motion. Keep hands, feet and clothing away from electrically or hydraulically powered parts. Disengage all power sources, and operate controls to relieve pressure.**

⚠ **Lower the equipment to the ground. Shut down the engine. Remove the key. Allow the machine to cool down.**

⚠ **Securely support any machine elements that have to be lifted so that maintenance can be carried out.**

⚠ **Keep all parts in good condition and properly installed. Repair damage immediately. Replace worn or broken parts. Remove any accumulations of grease, oil or debris.**

⚠ **Disconnect the battery ground cable (-) before making any adjustments to electrical systems or before welding on the machine.**

⚠ **Disconnect the connecting cable set from the tractor and all seeder modules before servicing electrical system components or before welding on the machine.**

▪ BOSCH operation manual

• Care and Maintenance - Part II

Keep your IPS system up to date for better results, pay attention to the recommendations and if in doubt contact your seeder dealer.

Keep your seeder protected from the rain. 	Carry out preventive and daily maintenance of the seeder, check the seeder manual. 	Keep up to date. Conduct the training and read the manual. 
Keep all components free from contact with fertilizers. 	Daily check the seeder and IPS components, consult the seeder manual. 	If in doubt, contact the seeder manufacturer. 
Do not use chemicals to clean IPS components. 	During periods of inactivity, keep the seeder free of wild animals. 	Do not remove connector seals. 
For best results, prefer paid GPS or RTK signals. 	Do not apply contact cleaner directly to seals. 	Always use original components for replacement. 
For best results, respect planting speeds. 	Keep the manual and quick guide in the tractor cab. 	

▪ BOSCH IPS Pre-Harvest Guide

• Pre-harvest review - Part I

Check your seeder before the harvest and ensure the correct functioning of the systems.

ALWAYS WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR THE WORK.

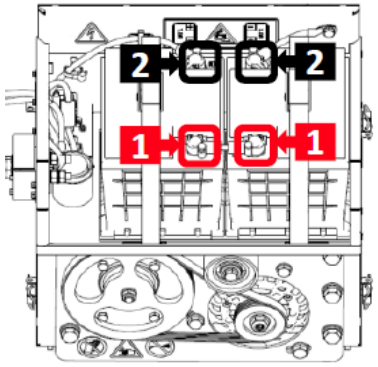
01 - GENERAL REVIEW

ACTIVITIES	WHAT TO DO
GENERAL CHECK Look for leaks and damaged items.	- Check all **electrical harnesses**, look for **crimped**, **cut** or **disconnected** cables. - Check that the screws on the motors and brackets are **tight** and that they are not bent or bent. - Look for and **repair leaks** in the PowerBox hydraulic hoses and hydraulic motor.
CLEANING Essential for the correct functioning of the mechanical parts and maintenance of the IPS system. 	- Clean up accumulations of **soil, straw** or **fertilizer.** - Clean lead **tubes** and **seed sensors**. - Tractor and PowerBox **battery** poles must **not** have **zinabre** on poles and crop remains. - **Clean** oxidized **connectors** with contact cleaner (do **not** let the **contact cleaner** get on the rubber **seals**). - Lightly **lubricate** the **rubbers** of the disconnected connectors and connect the terminals. - Do **not** direct **water jets** at the connectors and components of the **IPS system** when washing the seeder. **Pack the connectors with plastic.**
REPLACEMENT Worn or broken components reduce the quality of the planting.	**CONTACT YOUR PREFERRED DEALER FOR GENUINE PARTS AND SERVICES.**

▪ BOSCH IPS Pre-Harvest Guide

• Pre-harvest review - Part II

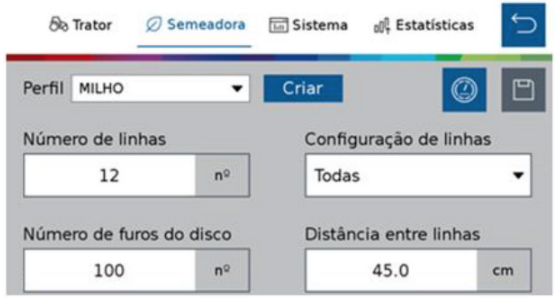
02 - IPS SYSTEM REVIEW - POWERBOX VERIFICATION

ACTIVITIES	WHAT TO DO
BATTERIES 	- Check all **electrical harnesses**, look for **crimped**, **cut** or **disconnected** cables. - Replace swollen or leaking batteries at the poles or housing. - Check the voltage of the batteries with a multimeter, on poles 1 and 2. Values below 12.4 V. ⊳ **Remove** the battery from the - PowerBox for **slow charging.** - With the IPS **display off**, turn on the PowerBox's **main switch.** The **alarm must sound.**
BELT AND TENSIONER	- Check belt wear. **Cut**, **cracked and damaged belts should be replaced.** - Check the tension roller. Excessive **play** or **noise** when running indicates **wear**.
OPERATION	- **Close the PowerBox cover before turning on.** - Turn on the IPS display and the main switch. - PowerBox RPM should be between 4500 and 7000 RPM. **Ideal 6000 RPM.** - Read rotation by working screen ⊳  

BOSCH IPS Pre-Harvest Guide

• Pre-harvest review - Part III

03 - DISPLAY CONFIGURATION

ACTIVITIES	WHAT TO DO
SEEDER SETTINGS  	- The **Profile** Perfil selected must be the **same** as the **crop to be planted.** - The number of **disc holes in the system** must be the **same** as the **discs in the batchers**. - The number of **lines** and the **distance** between lines must be the **same** on the **seeder**. - If the values are not correct, select another Profile Perfil or create a new one Criar
TRACTOR CONFIGURATION 	- If there is a **change of tractor** between crops, **check** the **dimensions** of the tractor and **positioning** of the GNNS **antenna**.

BOSCH IPS Pre-Harvest Guide

• Pre-harvest review - Part IV

04 - FUNCTIONAL TESTS - PART I

ACTIVITIES	WHAT TO DO
GNSS SIGNAL 	- After **configuring** the **autopilot** of the **open local** tractor  , access the work screen. - Check the signal status at the bottom right of the screen. **GPS Status**  GNSS open signal.  GNSS RTK signal.  No GNSS signal.
LIFT SENSOR	- **Before starting the test, check that there are no people close to the seeder.**  - Go to work screen - **Raise** and **lower** the **seeder** and in the lower right corner of the screen **check** the **sensor** status. **Lift sensor status**  Seeder lowered.  Seeder raised.

▪ BOSCH IPS Pre-Harvest Guide

• Pre-harvest review - Part V

05 - FUNCTIONAL TESTS - PART II

ACTIVITIES	WHAT TO DO
ENGINE TESTS	- Create a job called **TEST** with Fixed  Seed Rate. - Set the **simulated** planting **speed**. Ex. 5 km/h.  - Return to the home screen and click **“Continue Work”**.  - **Without seeds** in the batchers, **turn on the vacuum** and **lower** the **seeder**. The engines will start automatically. - Check on the **work screen** that the line icons do **not** show **errors**.  - In **case** of **error**, check if the **motor** is **connected**, if the **disc** / **shaft** is **bent** / **misaligned** or if the **batcher** is **locked**. - **Get off the tractor and check all engines**. They must **rotate easily**, **without** extraneous **noise** and **aligned** with the batcher.
CALIBRATION FERTILIZERS*	- Calibrate the fertilizer according to page 116 and 117.

*** Optional item**

▪ BOSCH Manual of NMEA Settings (GPS)

• BOSCH IPS

BOSCH IPS STANDARD



⚠ ATTENTION

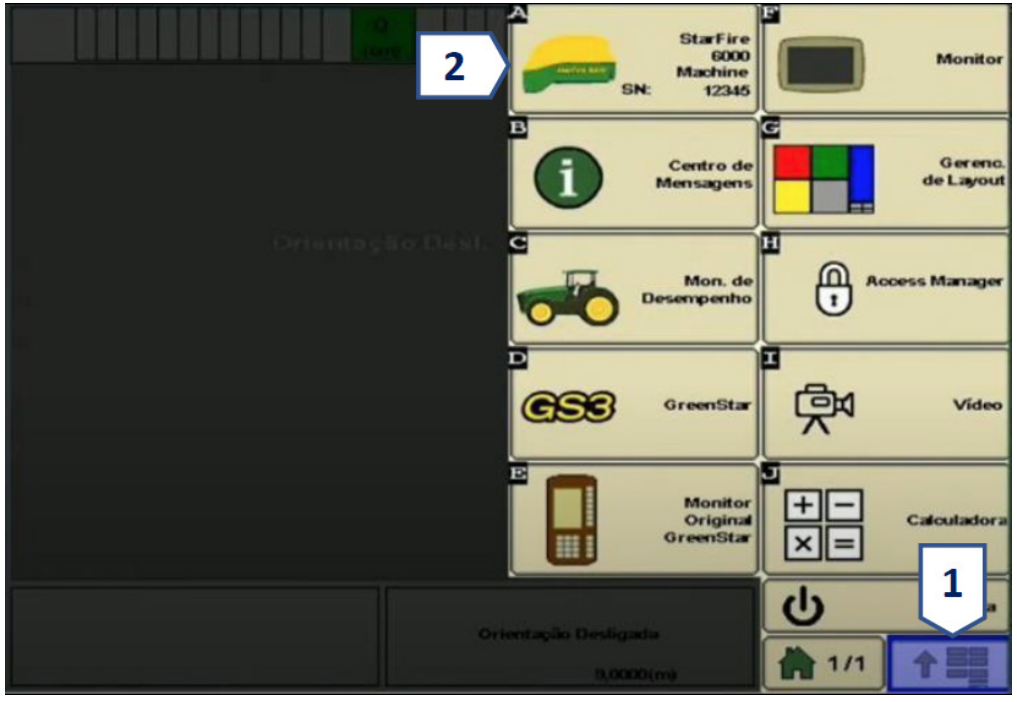
The NMEA settings manuals on the following pages meet the main display models on the market, but if you have another display model not mentioned, enter the main settings for operation:

STANDARD
- Baud Rate: 38400
- Messages: GGA 10 HZ and VTG 10HZ

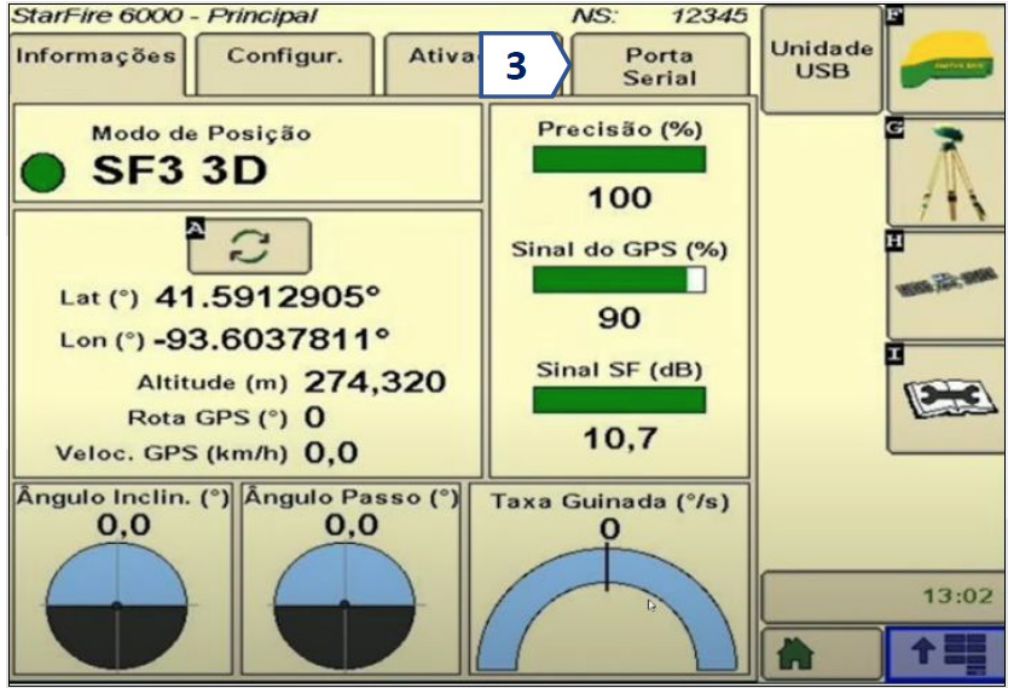
▪ BOSCH Manual of NMEA Settings (GPS)

• John Deere (GS3/GS4) - Part I

1. Click on the **MENU** icon.
2. Click on the **STARFIRE** GPS antenna icon.



3. On the Starfire Antenna main screen, select the **SERIAL PORT** Tab.



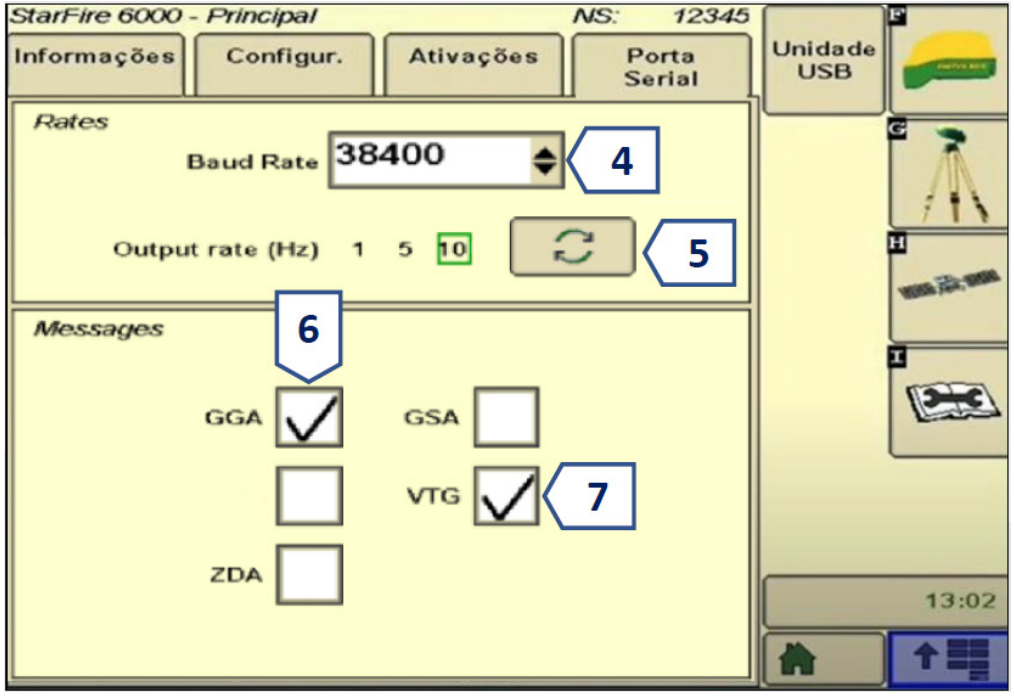
NOTE

This configuration must be done for BOSCH Standard (With Display) or ISOBUS systems on John Deere tractors.

▪ BOSCH Manual of NMEA Settings (GPS)

• John Deere (GS3/GS4) - Part II

4. Change the baud rate (Baud Rate) **38400;**
5. Output Frequency (Output Rate) to **10 Hz;** Turn on the **GCA** and **VTG** messages, ensure there is a checkmark (✓) in the box.

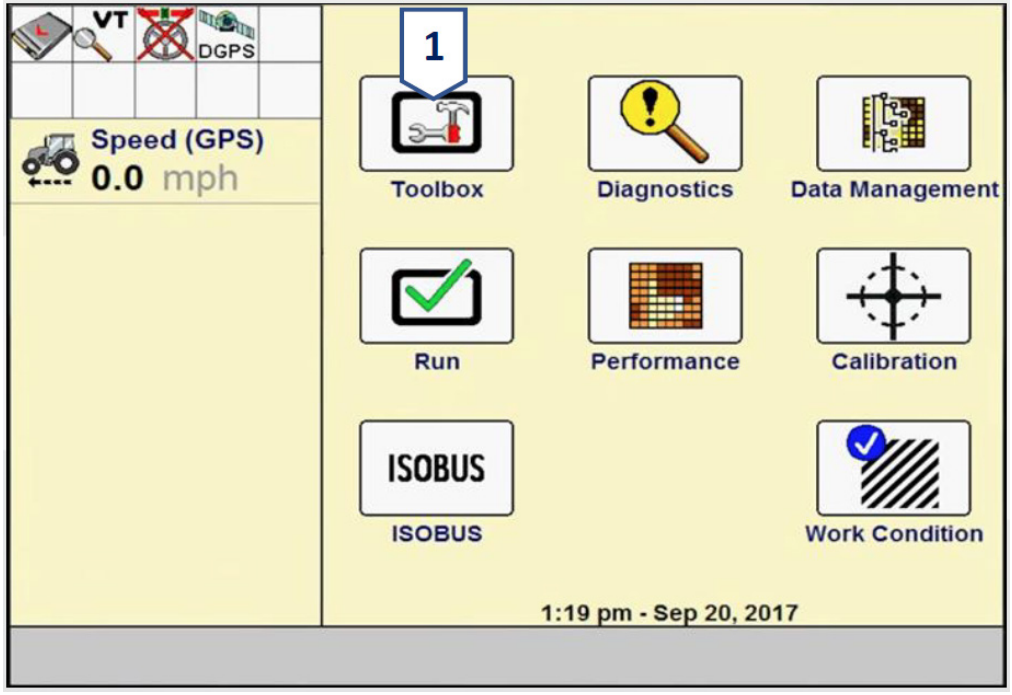


When finished, click  to return to the work screen.

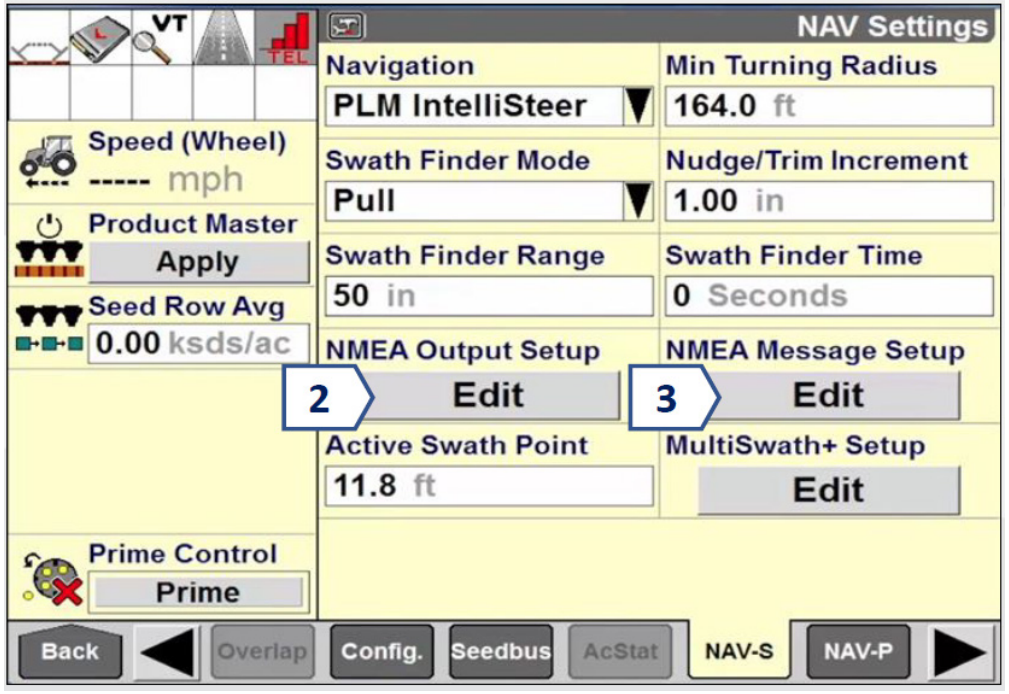
BOSCH Manual of NMEA Settings (GPS)

• Pro 700/IntelliView - Part I

1. Click on the Tools icon **(Toolbox).**



2. Click the **Edit** icon **(NMEA Output Setup)** to enable the signals output.
3. Click the **Edit** icon **(NMEA Messages Setup)** to select the messages that the BOSCH IPS system will use.



NOTE

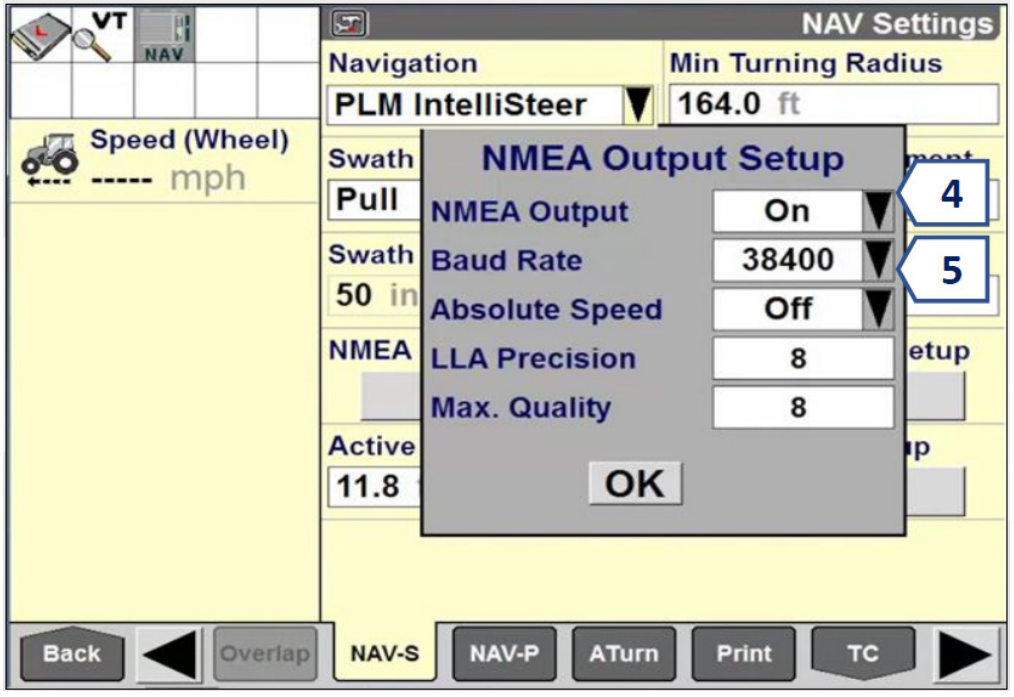
Equivalent configurations for Pro 700 (Case) and IntelliView (New Holland) for BOSCH IPS Standard (With Display) and ISOBUS system (Tractors not meeting NMEA 11783 protocol, e.g. Case Puma, NH T6/T7.

▪ BOSCH Manual of NMEA Settings (GPS)

• Pro 700/IntelliView - Part II

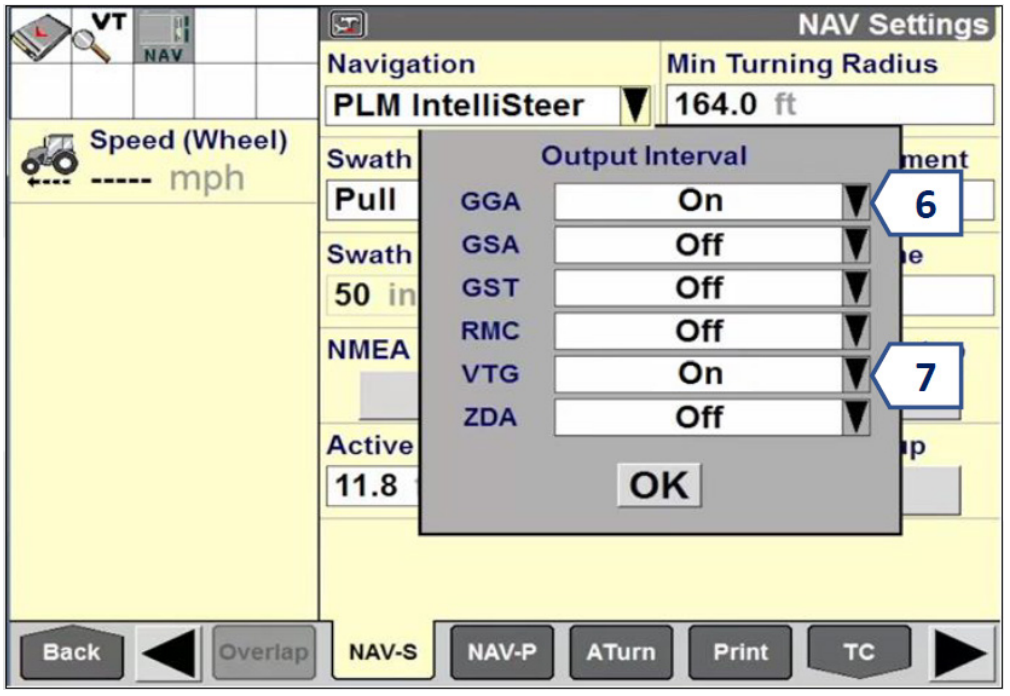
Item 2 - NMEA Output Configuration Screen

4. Select **ON** in the **(NMEA Output)**field to enable.
5. In the **(Baud Rate)** field, select the value 38400.



Item 3 - NMEA Messages Configuration Screen

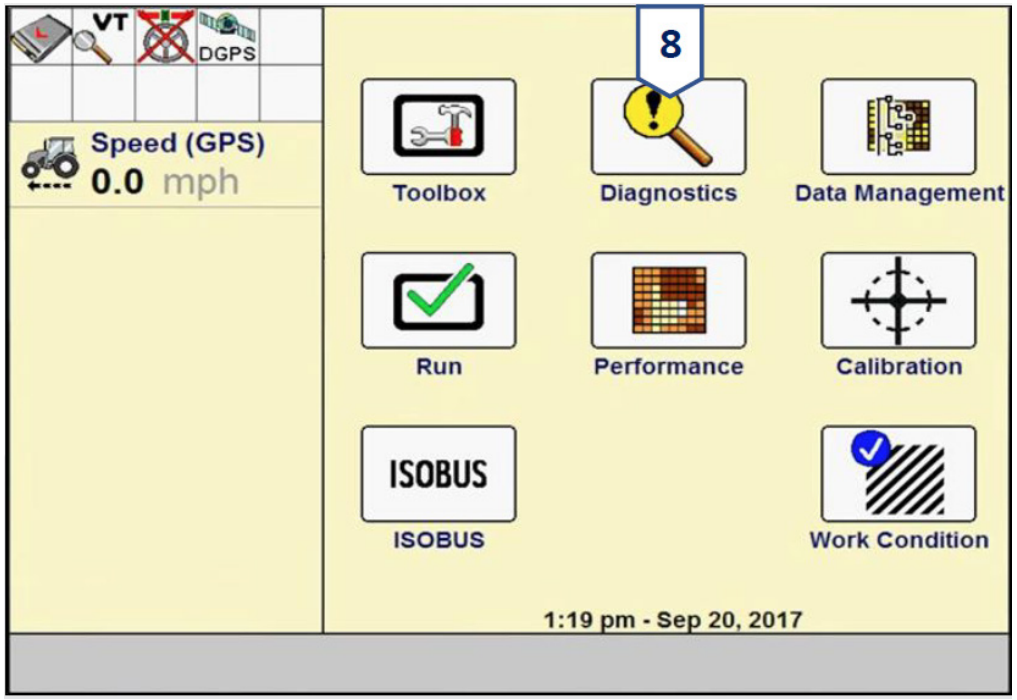
6. Select **ON** in the GGA message box.
7. Select **ON** in the VTG message box.



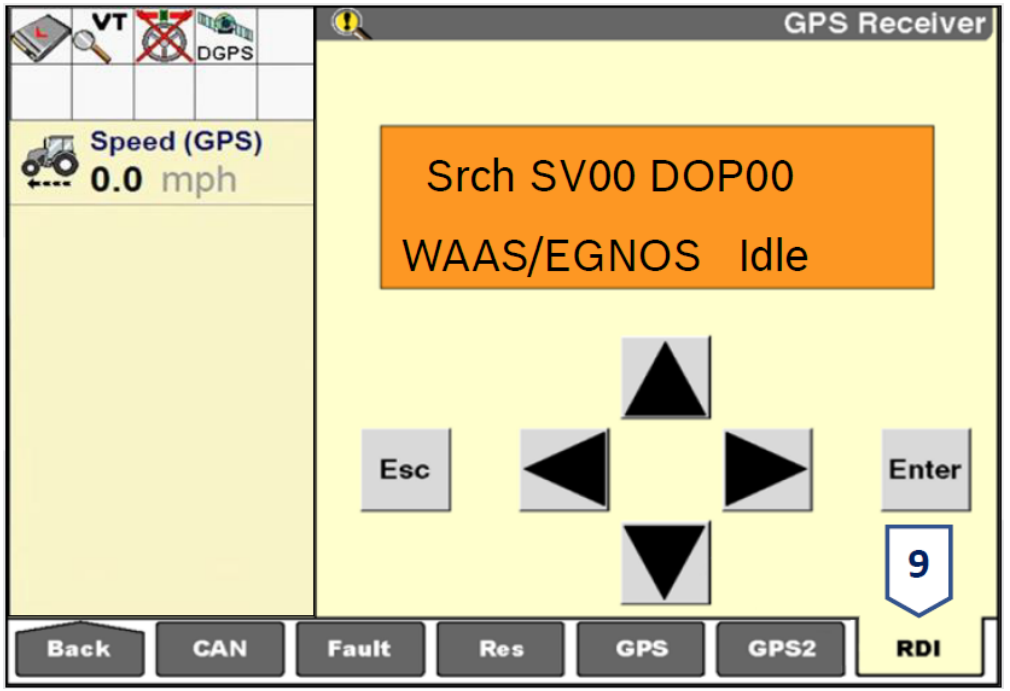
BOSCH Manual of NMEA Settings (GPS)

• Pro 700/IntelliView - Parte III

8. Following the settings, return to the menu screen and click on the **Diagnostics** icon.



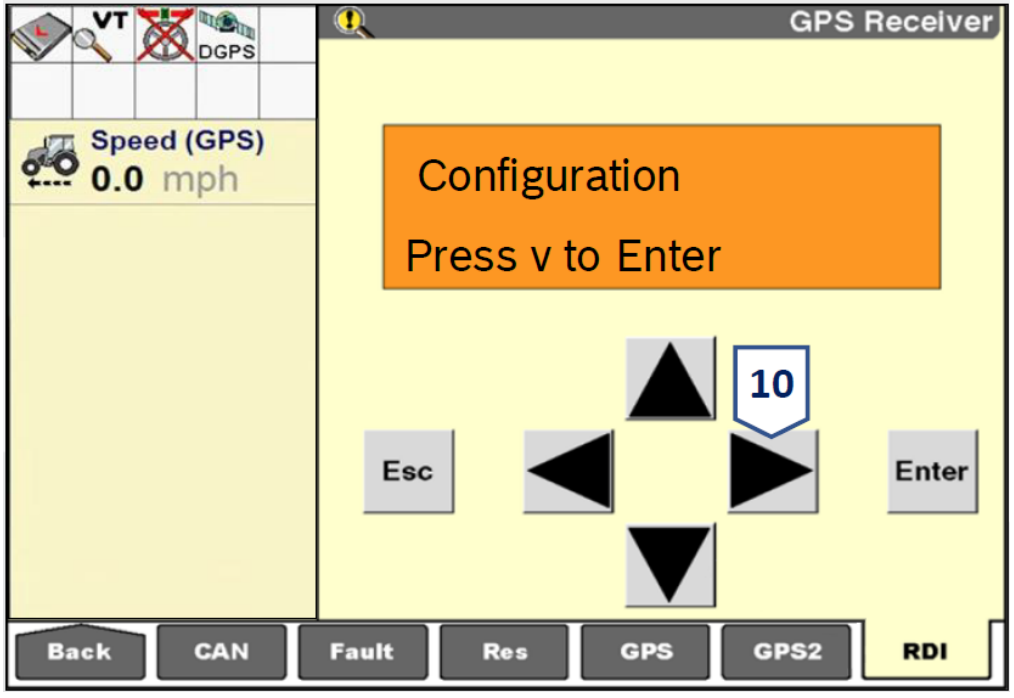
9. When accessing the Diagnostics screen, use the lower arrows to find the **RDI (Receiver Diagnostic Interface)** Tab and click to access.



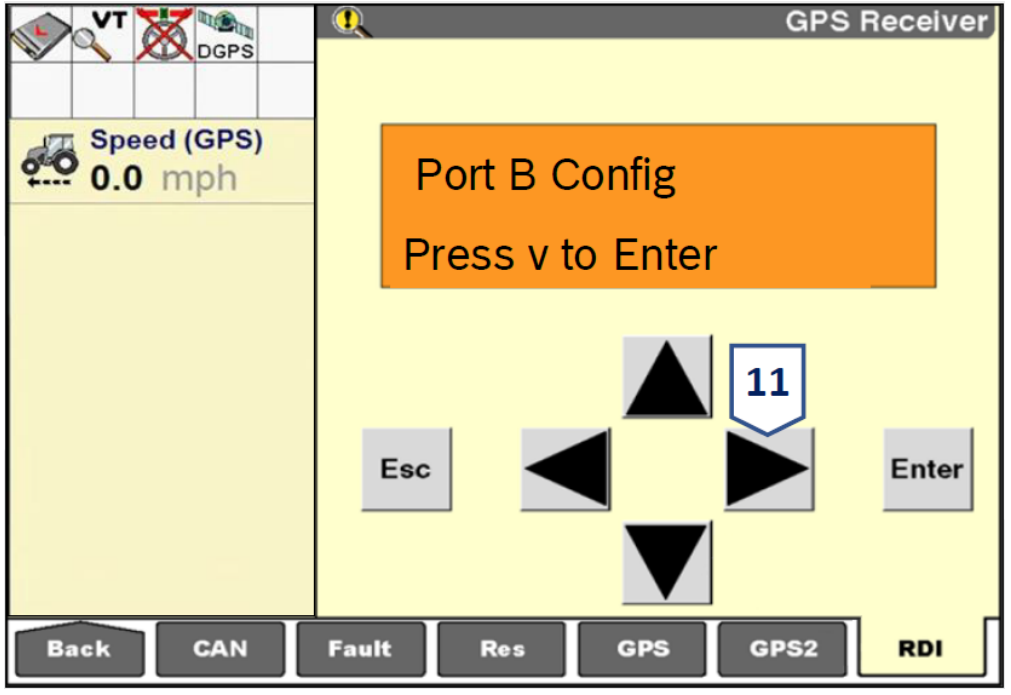
▪ BOSCH Manual of NMEA Settings (GPS)

• Pro 700/IntelliView - Part IV

10. Press the right arrow (▶) until you reach **Configuration** and press the down arrow (▼) to access.



11. Press the right arrow (▶) until you reach **Port B Config** and press the down arrow (▼) to enter.



▪ BOSCH Manual of NMEA Settings (GPS)

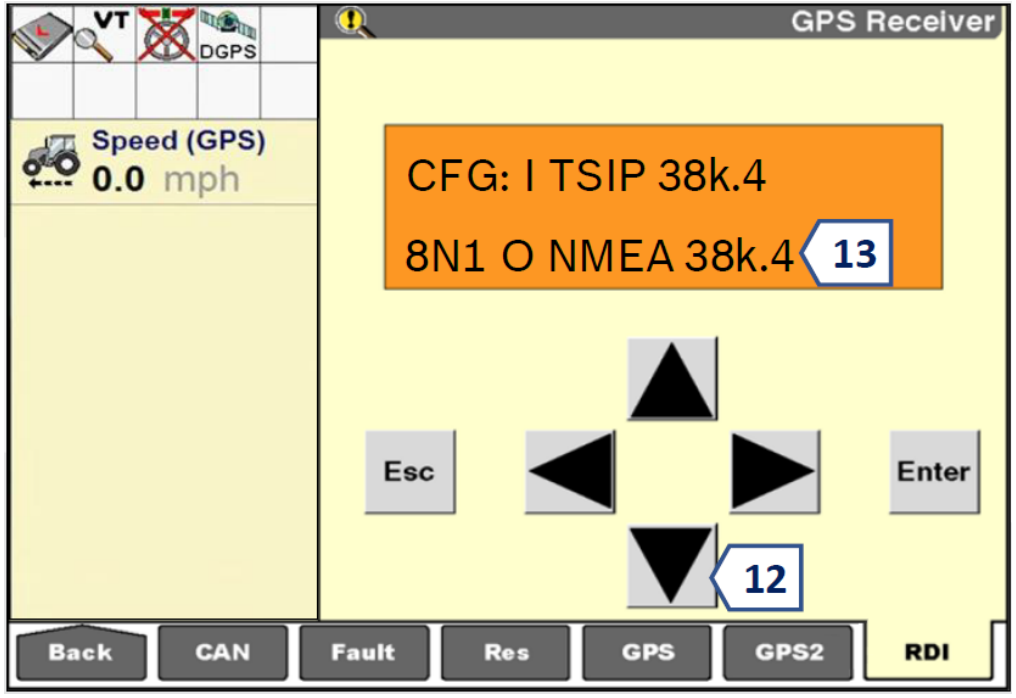
• Pro 700/IntelliView - Part V

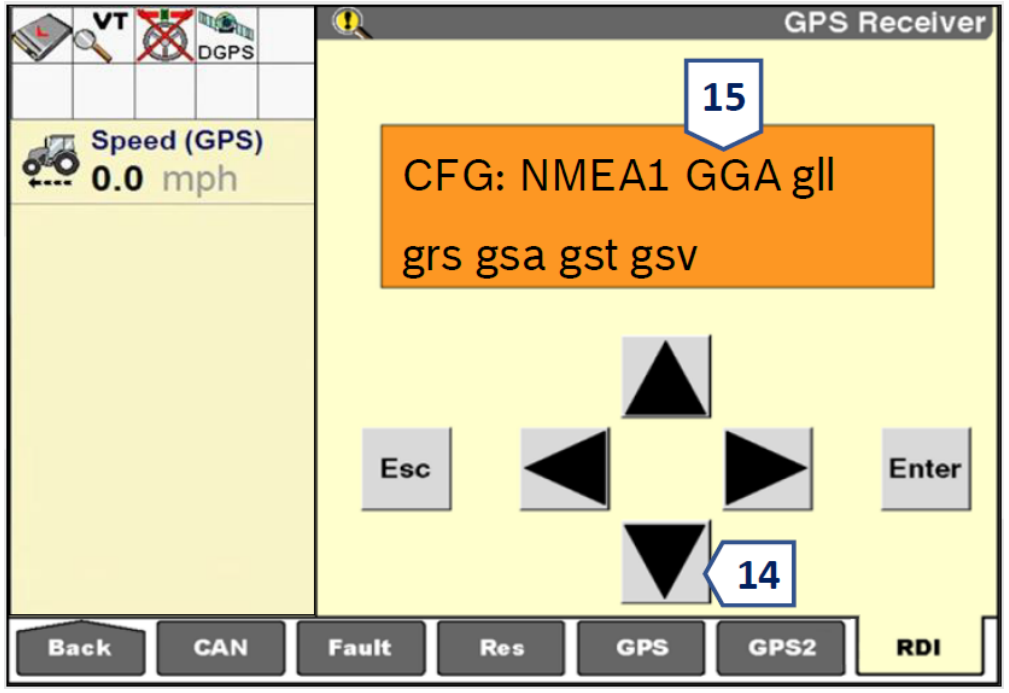
12. Press the down arrow (▼) until you reach the next field.
13. Line **8N1** O change to **NMEA** and set the Baud Rate to **38k.4** as shown in the figure below.

To change, click the right arrow (▶), move the cursor to where you want to change and press the arrow (▼) or (▲) to select. Click **Insert** to finish.

14. Press the down arrow (▼) until you reach the CFG field: NMEA1.
15. Only the GCA message must be capitalized.

To change, click the right arrow (▶), move the cursor to where you want to change, and press the arrow (▼) or (▲) to select. Click **Insert** to finish.





▪ BOSCH Manual of NMEA Settings (GPS)

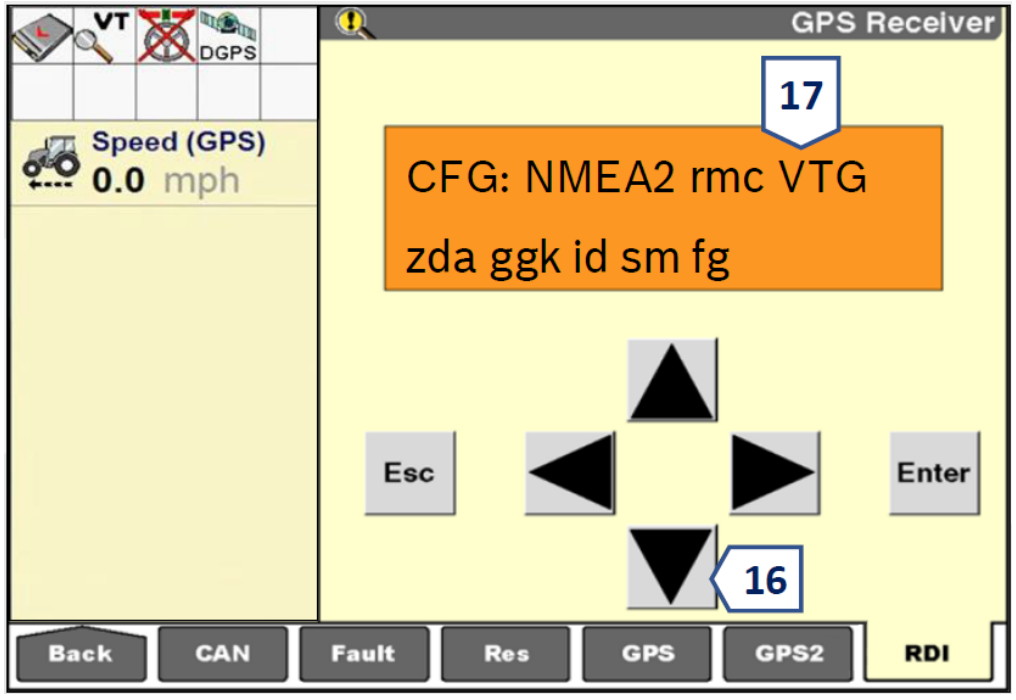
• Pro 700/IntelliView - Part VI

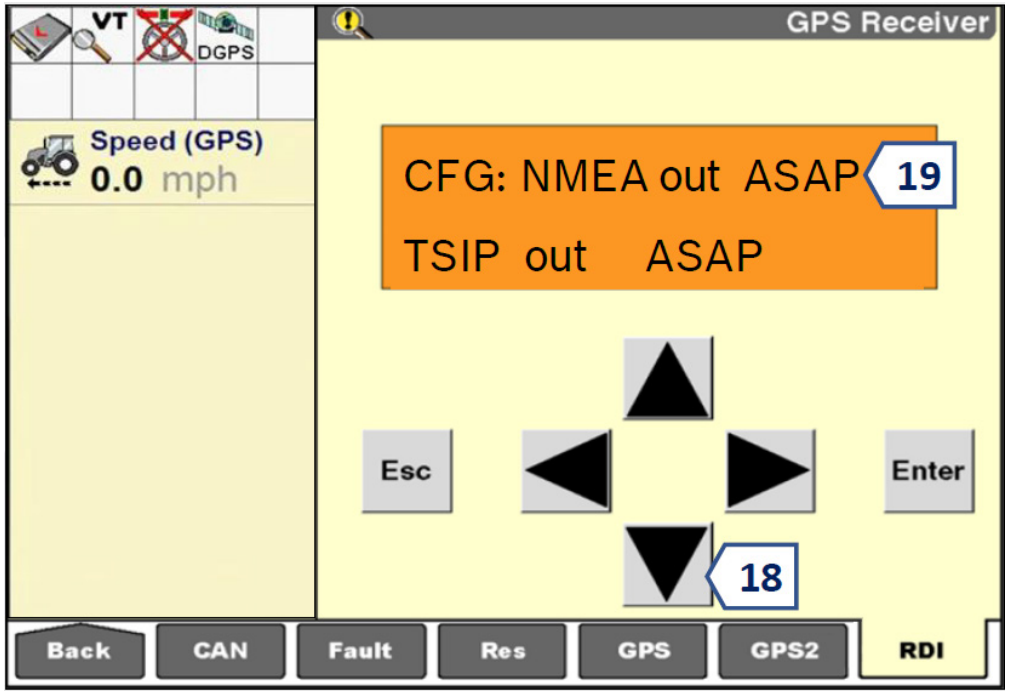
16. Press the down arrow (▼) until you reach the CFG field: NMEA2.
17. Only the VTG message must be capitalized.

To change, click the right arrow (▶), move the cursor to where you want to change, and press the arrow (▼) or (▲) to select. Click **Insert** to finish.

18. Press the down arrow (▼) until you reach the CFG field: NMEA Out.
19. The NMEA Out line must be changed to **ASAP**.

To change, click the right arrow (▶), move the cursor to where want to change and press the arrow (▼) or (▲) to select. Click **Insert** to finish.
After finishing the settings you can click **EXIT**.

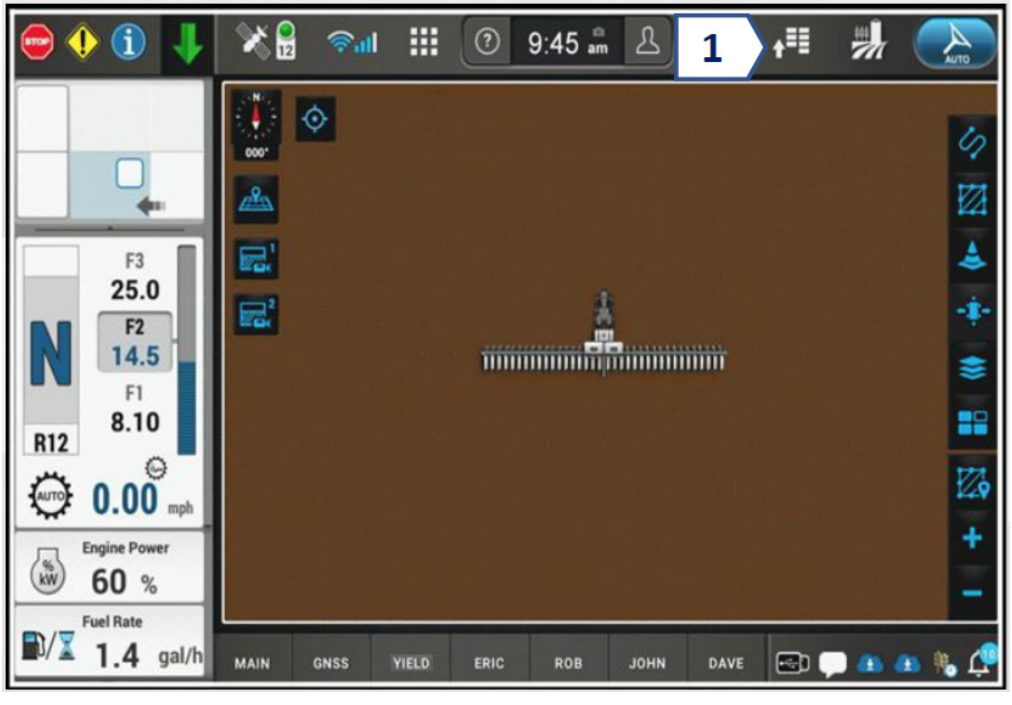




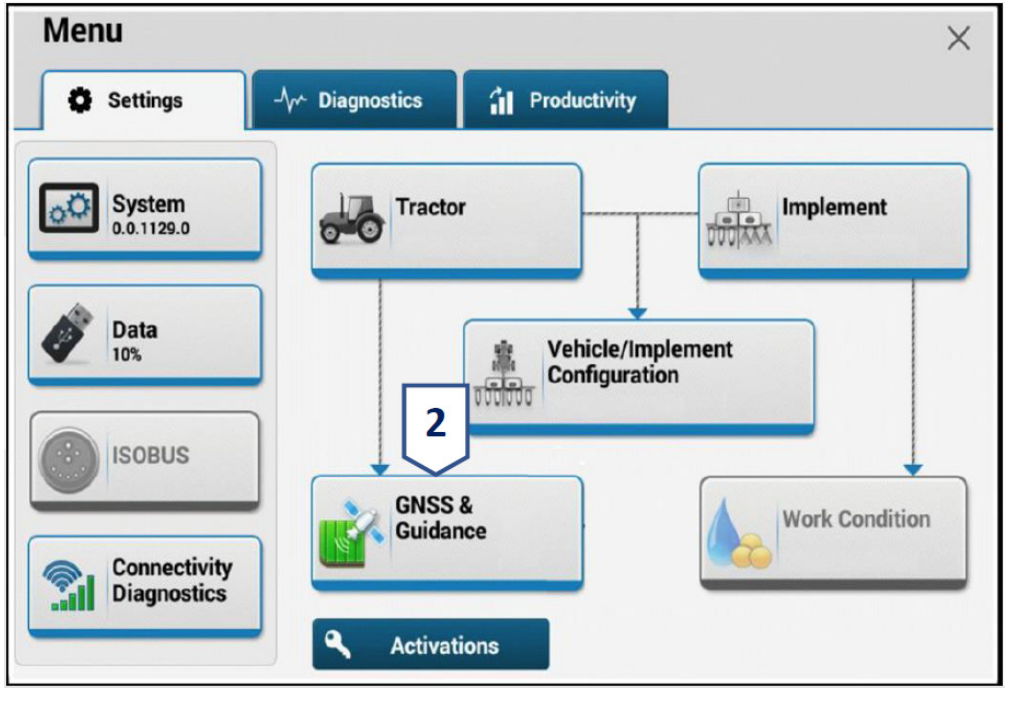
BOSCH Manual of NMEA Settings (GPS)

• AFS Pro 1200/IntelliView 12 - Part I

1. Click the **Menu** icon on the top bar of the screen.



2. Click on the **GNSS & Guidance** icon to configure the output of NMEA signals.



NOTE

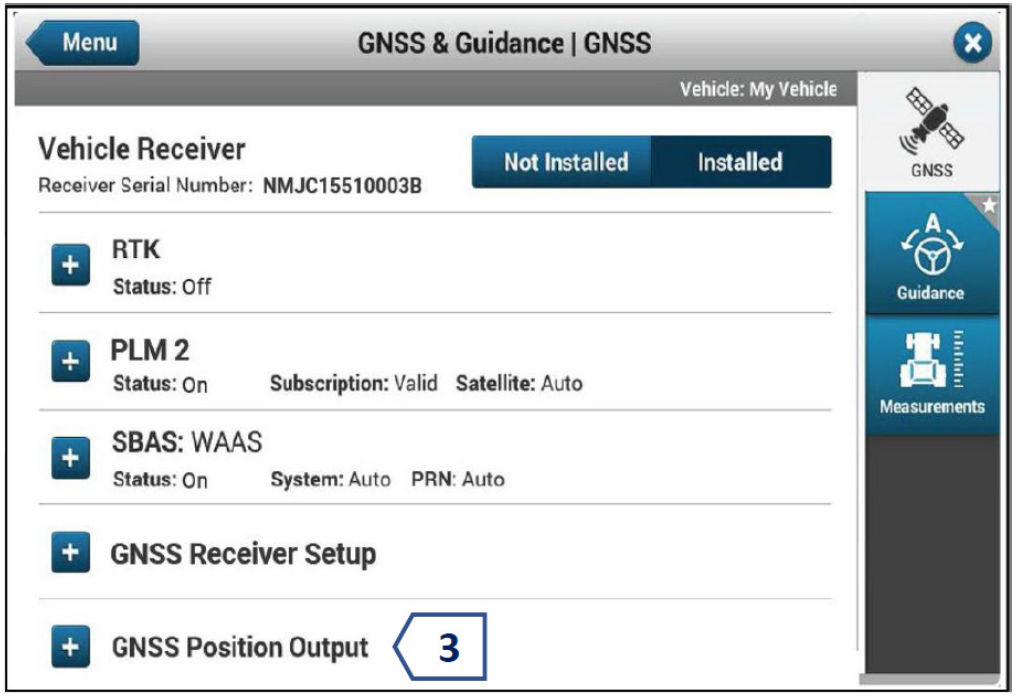
Equivalent configurations for AFS Pro 1200 (Case) and IntelliView 12 (New Holland) for BOSCH IPS Standard system, on T8 and T9 tractors.

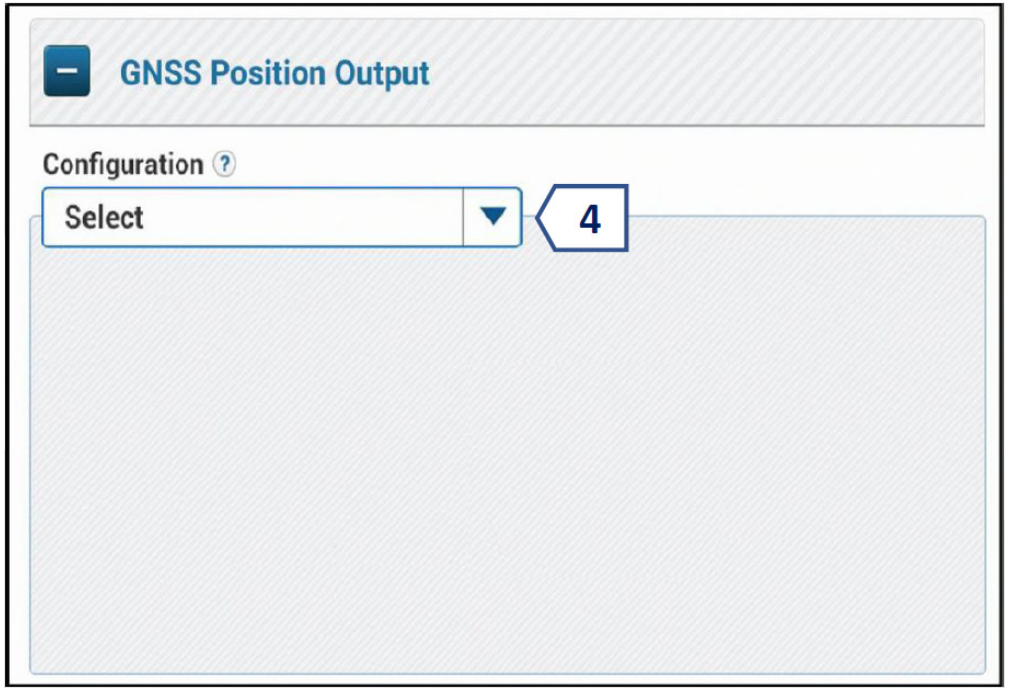
▪ BOSCH Manual of NMEA Settings (GPS)

• AFS Pro 1200/IntelliView 12 - Part II

3. Click on the **GNSS Position Output option**.

4. Click the **Configuration** drop-down menu;
5. Select **Add new**;
6. Set a name and click **OK.**





▪ BOSCH Manual of NMEA Settings (GPS)

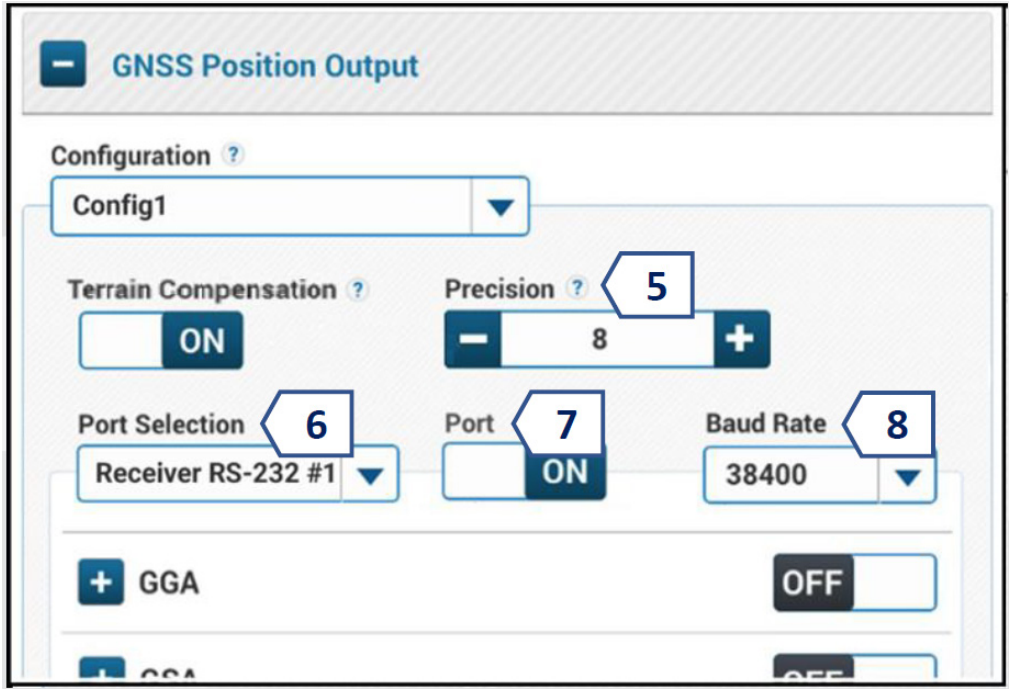
• AFS Pro 1200/IntelliView 12 - Part III

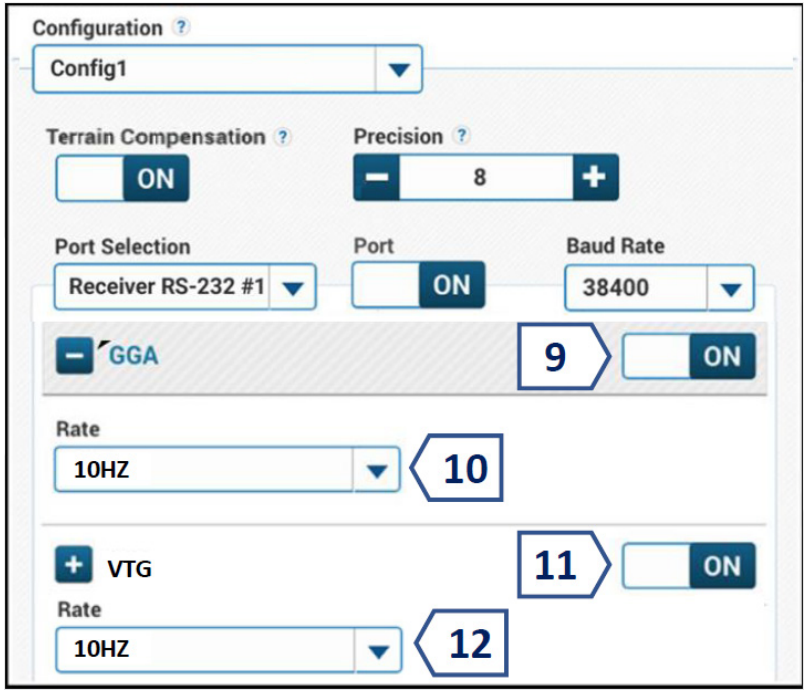
5. Precision - 8 decimal places.
6. Port Selection - Select **Receiver RS-232#1.**
7. Port - Select **ON.**
8. Baud Rate - Select **38400**.

9. Enable the message **GCA** - Set it to **ON**;
10. Rate in **10 Hz**.

11. Message **VTG** - Put on **ON**;
12. Rate in **10 Hz**.

Completed settings.





▪ BOSCH Manual of NMEA Settings (GPS)

• TopCon (X14/XD)

1. Click on the **TopCon** icon.
2. Click on **Settings** icon.
3. Click on the **System** icon.
4. Click on **GPS** icon.



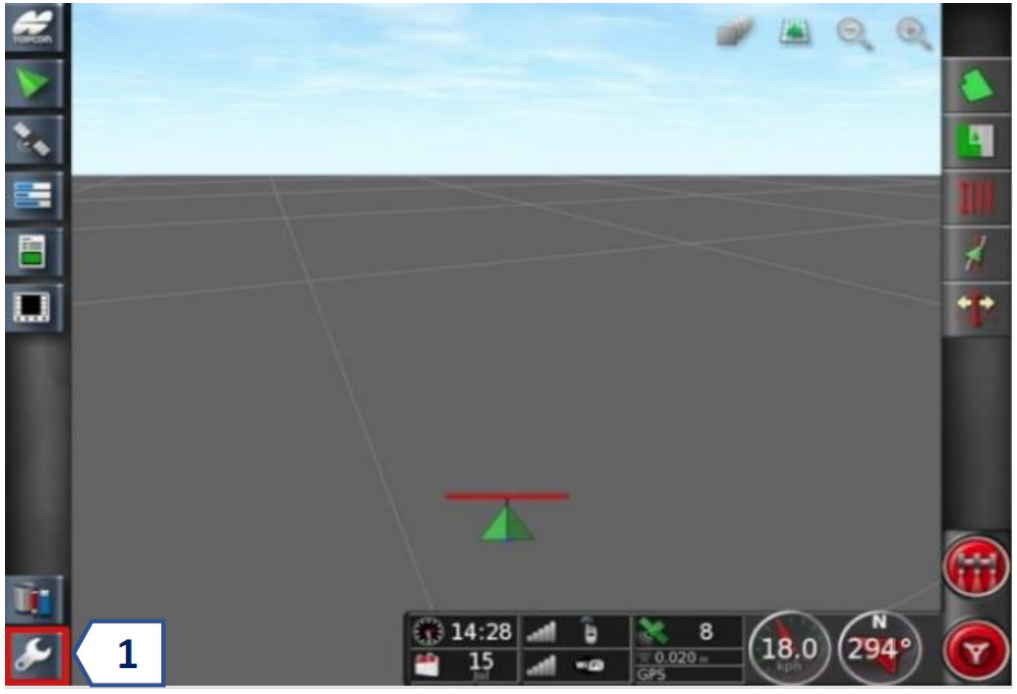
Need to request monitor update from TopCon representative, who will release NMEA settings.

This setting must be done for BOSCH IPS Standard (With Display) systems.

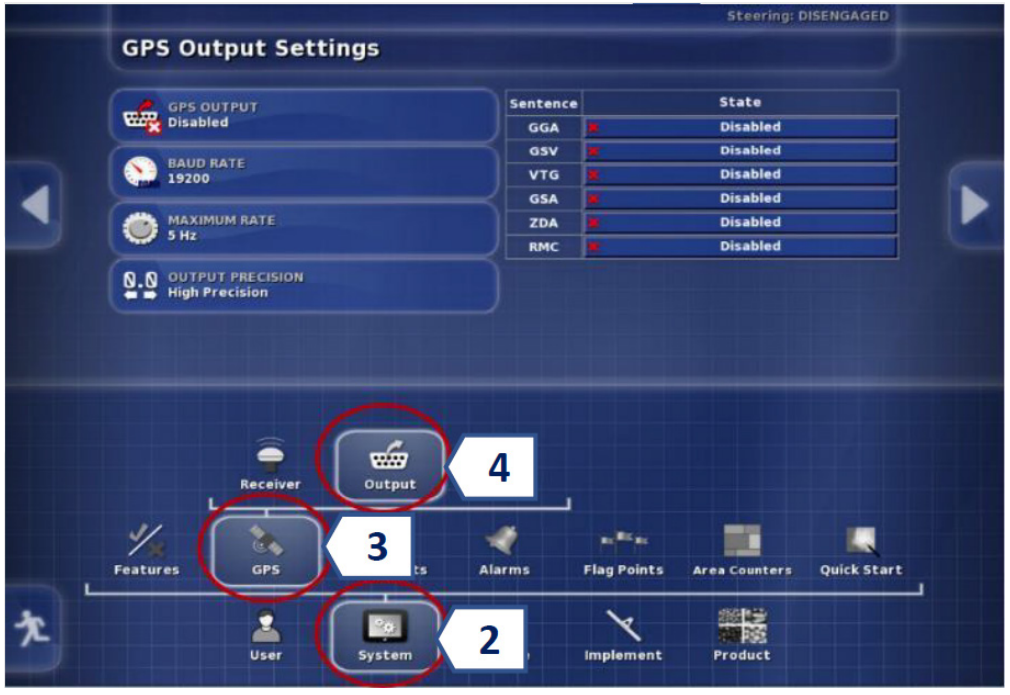
▪ BOSCH Manual of NMEA Settings (GPS)

• TopCon (X25, X30 and X35) - Part I

1. Click on **Settings** icon.



2. Click on the **System** icon;
3. Click on **GPS** option.
4. Click on the **Output** option;

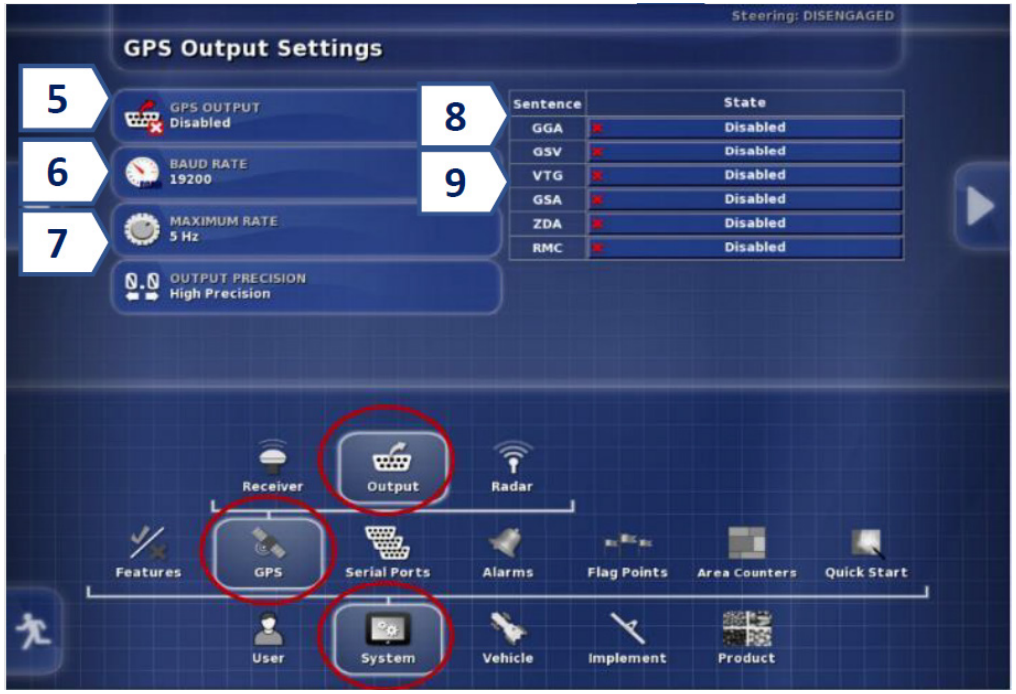


This setting will be equivalent for X-series monitors for BOSCH IPS Standard (Com Display) system.

▪ BOSCH Manual of NMEA Settings (GPS)

• TopCon (X25, X30 and X35) - Part II

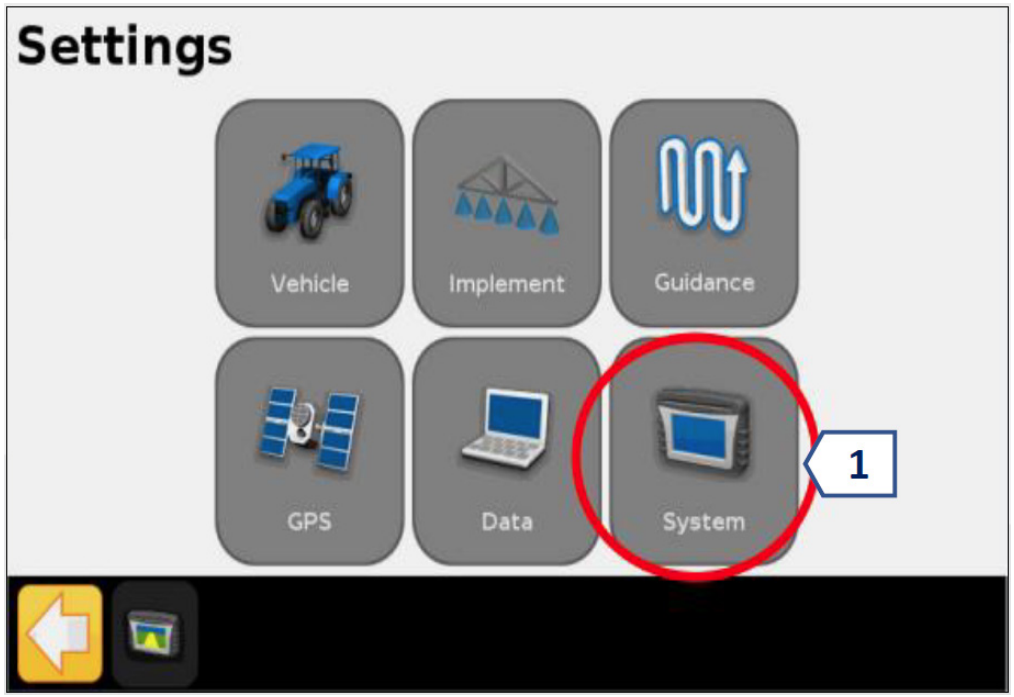
5. GPS Output (GPS Output) - Select **Enabled**;
6. Baud Rate - Select option **38400**.
7. Maximum Rate - Select **10 Hz**;
8. GGA Message - Select the ✓ **Enabled** option;
9. VTG Message - Select the ✓ **Enabled** option;



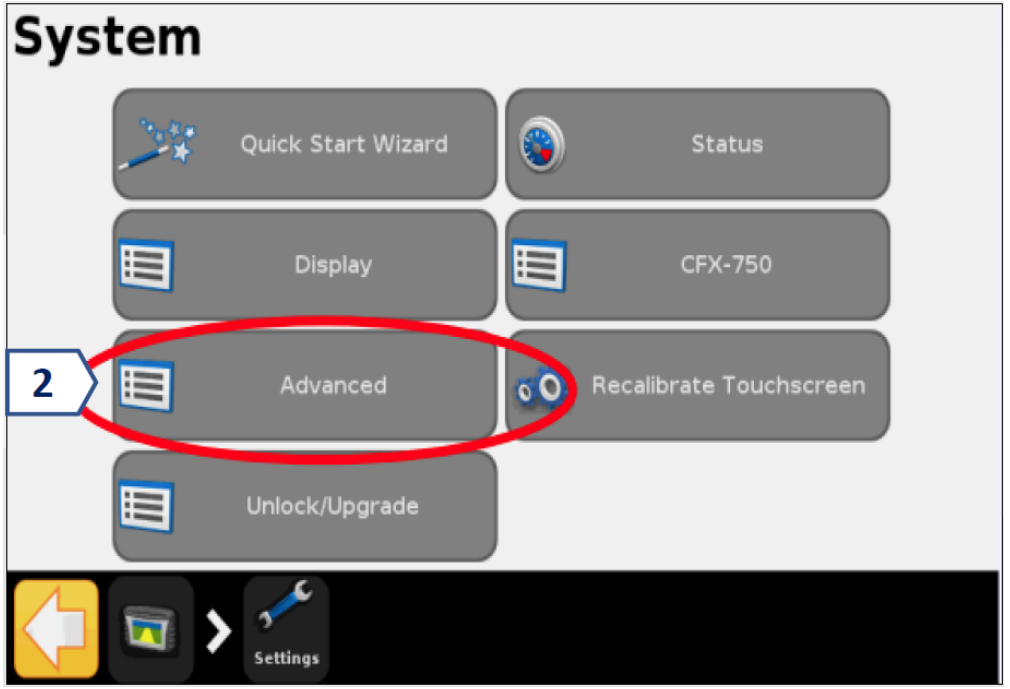
▪ BOSCH Manual of NMEA Settings (GPS)

• Trimble (CFX/FM-750) - Part I

1. Click on the **System** icon.



2. Click on the **Advanced** icon;

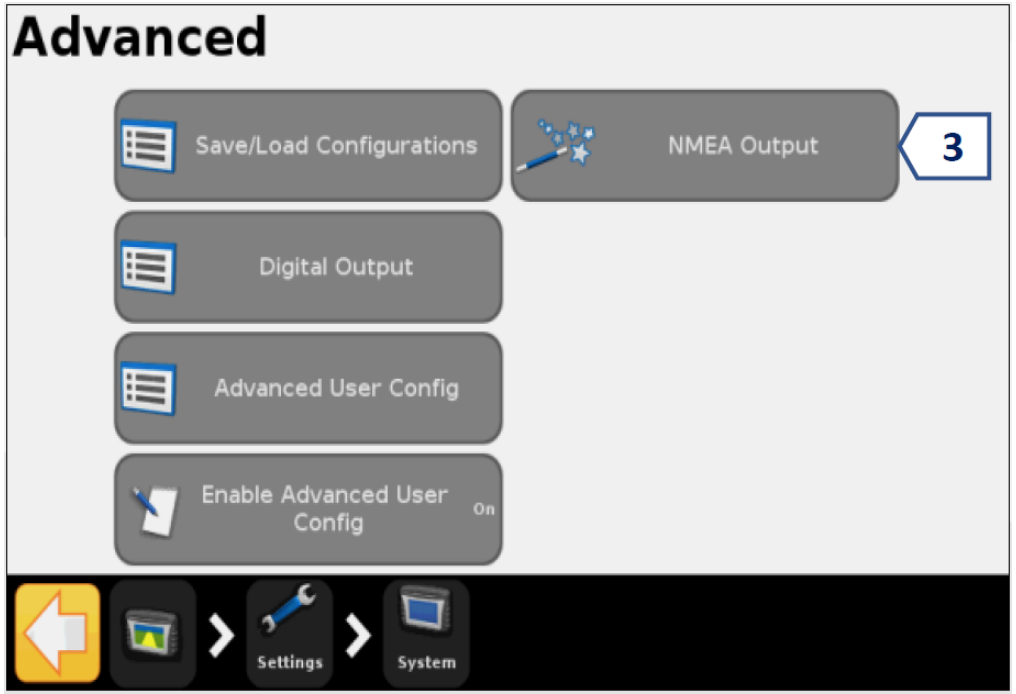


This setting must be done for BOSCH IPS Standard (With Display) systems.

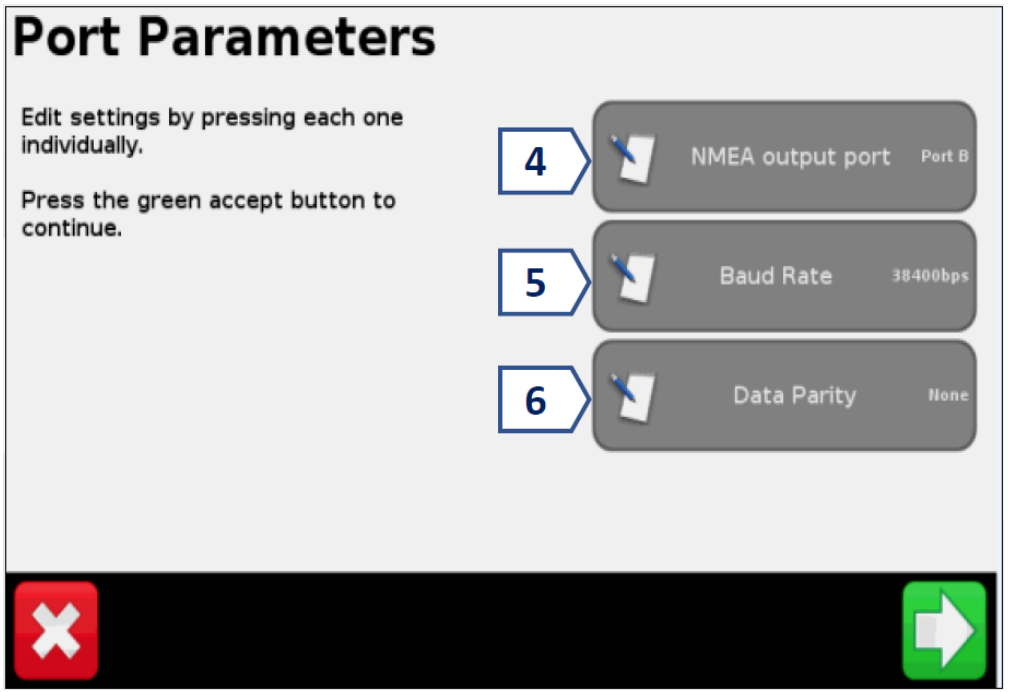
▪ Manual BOSCH de configurações NMEA (GPS)

• Trimble (CFX/FM-750) - Parte II

3. Click the **NMEA Output** icon.



4. In the **Output Port** option **(NMEA Output Port)** select which one was connected, A.
5. In **Baud Rate** set **38400**.
6. In Data Parity leave it in None.

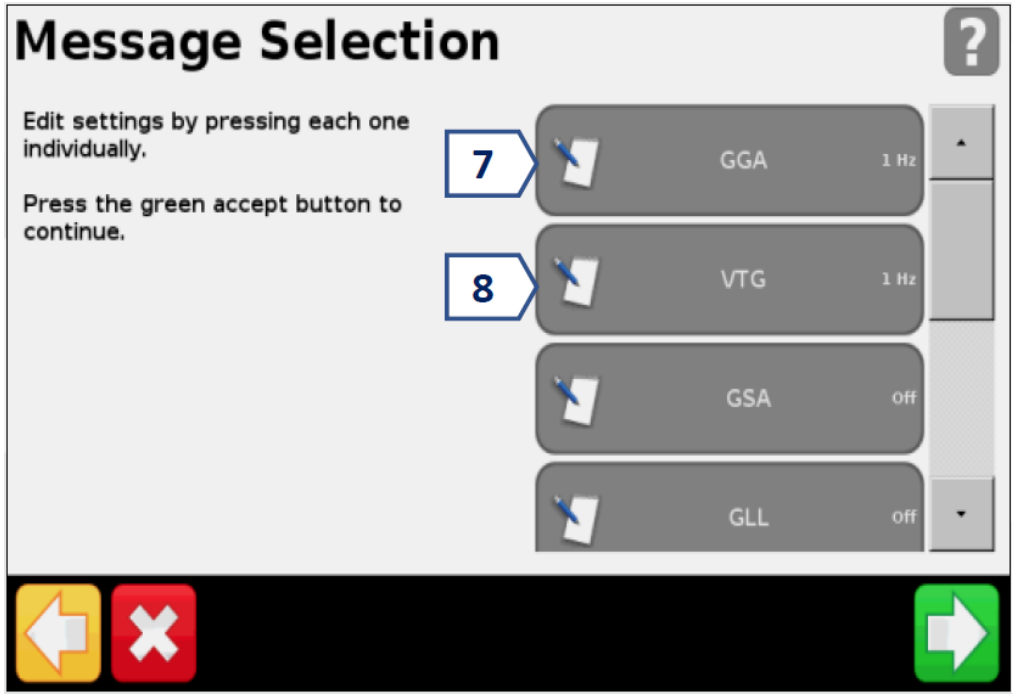


Press  **to continue setup.**

BOSCH Manual of NMEA Settings (GPS)

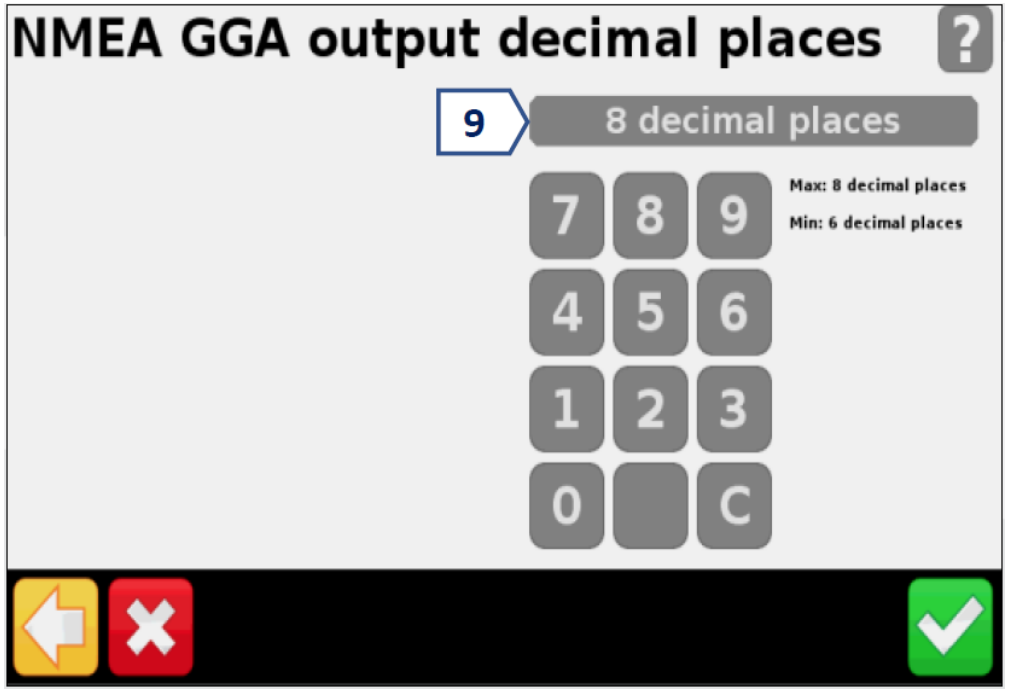
• Trimble (CFX/FM-750) - Part III

7. Enable **GGA** message with **10 Hz.**
8. Enable **VTG** message with **10 Hz.**



Press to continue setup.

9. For **GGA** and **VTG** messages set **8 decimal places (8 decimal places).**



Press to complete settings

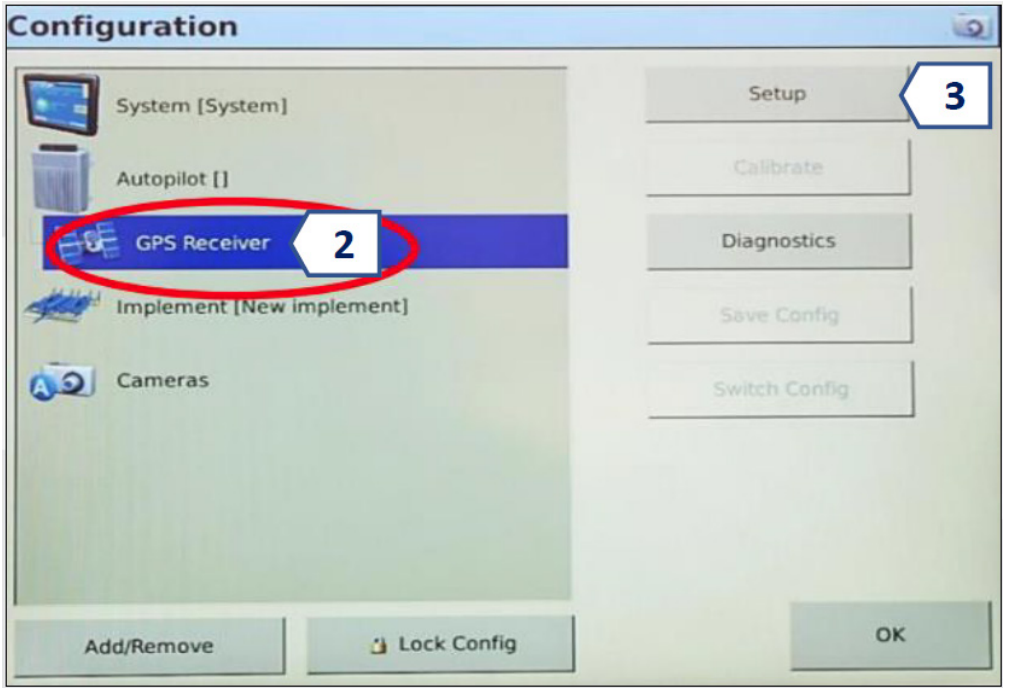
▪ BOSCH Manual of NMEA Settings (GPS)

• Trimble (FMX/FM-1000) - Part I

1. Click on the **Settings** icon;



2. Click on the GPS **(GPS Receiver)** icon.
3. Click on the **Setup** icon.



This setting must be done for BOSCH IPS Standard (With Display) systems.

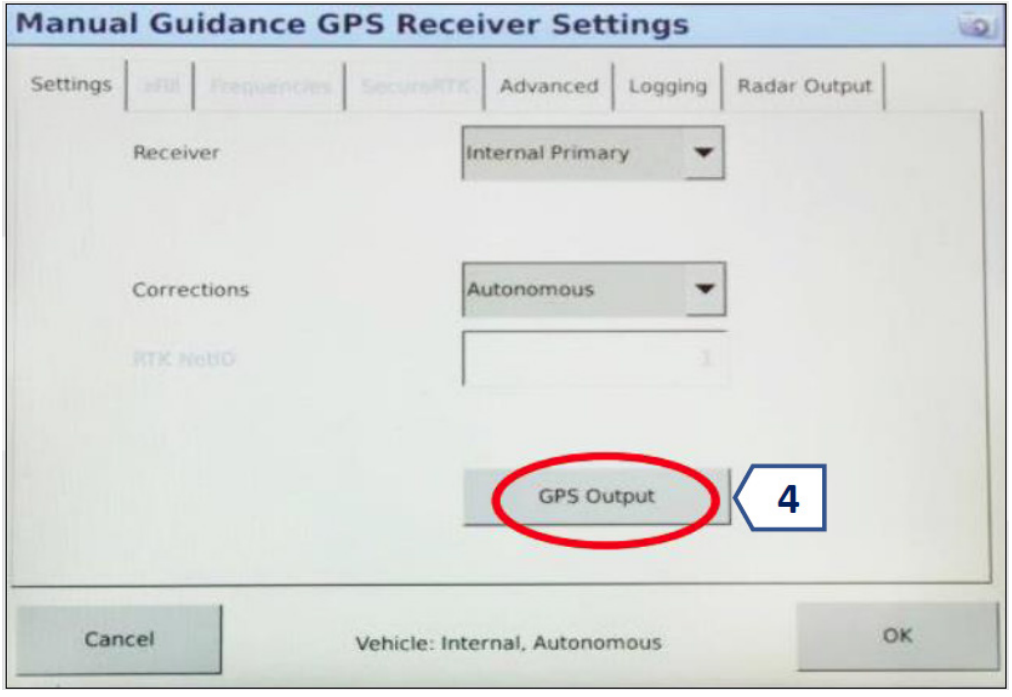
BOSCH Manual of NMEA Settings (GPS)

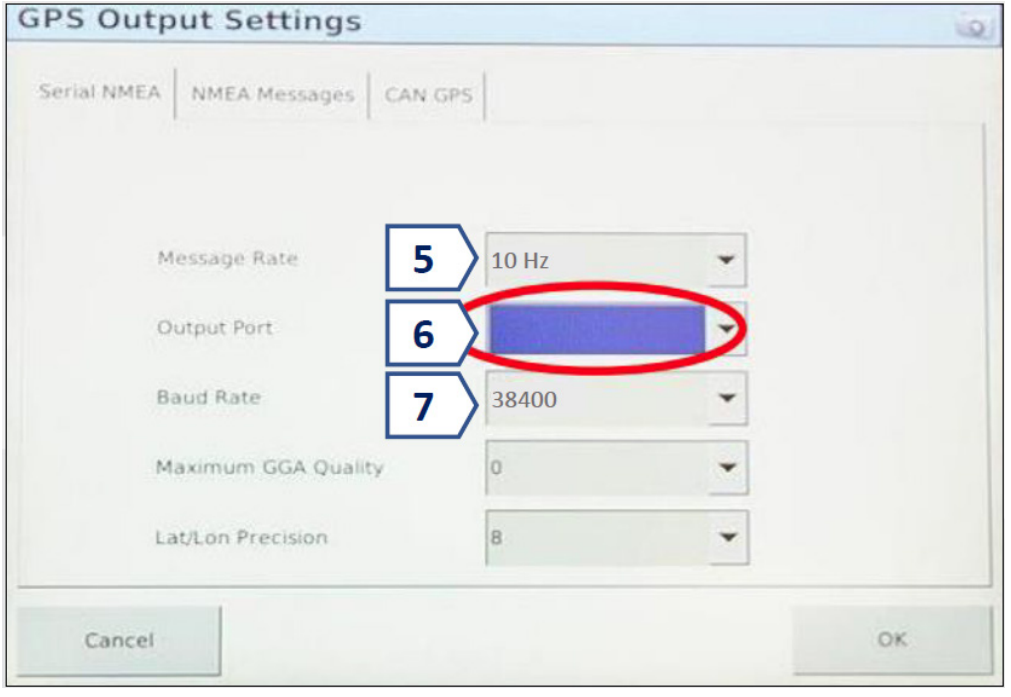
• Trimble (FMX/FM-1000) - Part II

4. Click on the **GPS Output** icon;

On the NMEA Serial Tab, configure the following data:

5. Message rate - **10 Hz**.
6. Output Port - Select which port the GPS cable was connected to.
7. Baud Rate - **38400.**

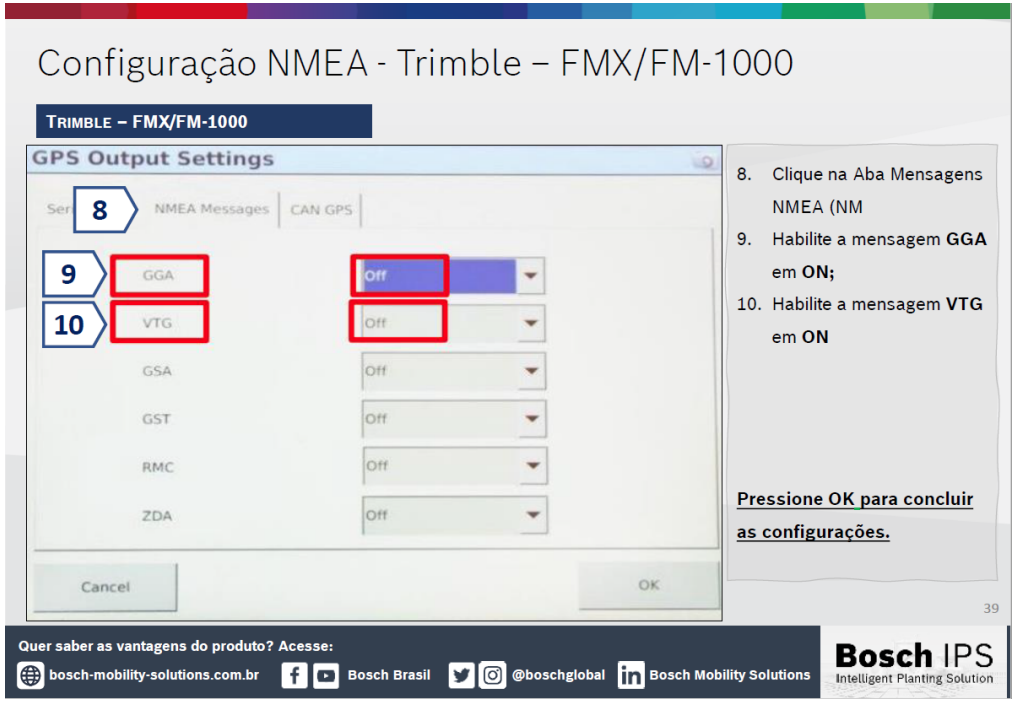




▪ BOSCH Manual of NMEA Settings (GPS)

• Trimble (FMX/FM-1000) - Part III

8. Click the NMEA Messages Tab.
9. Enable the **GGA** message **ON**;
10. Enable **VTG** message to **ON**.

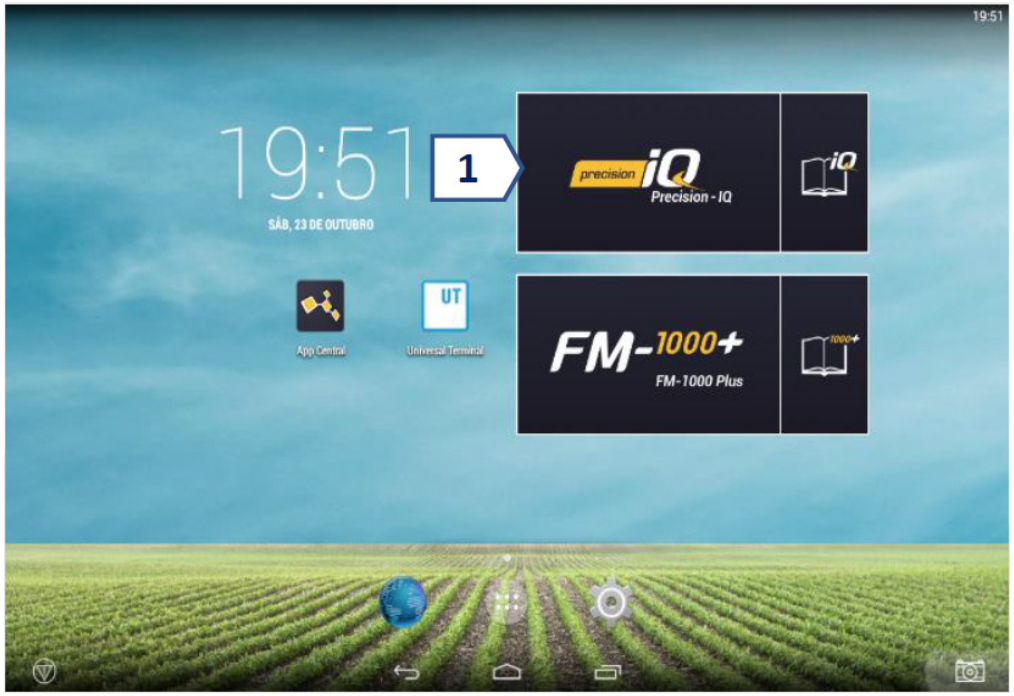


Press OK to complete the settings.

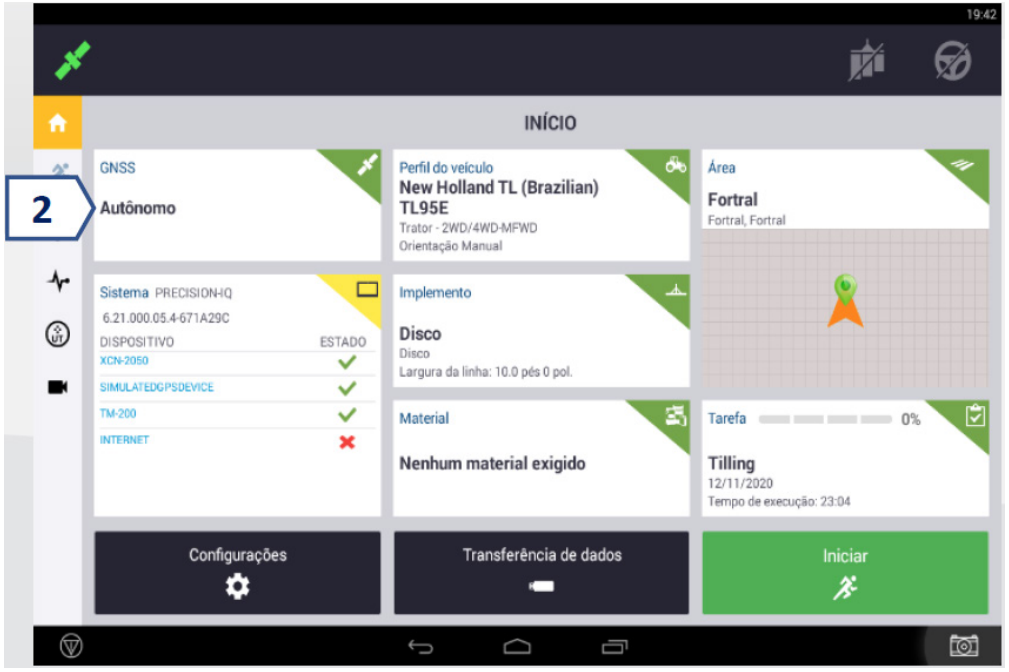
▪ BOSCH Manual of NMEA Settings (GPS)

• Trimble (GFX-750/TMX-2050) - Part I

1. Click on the **Precision IQ** icon located on the desktop.



2. Click on **GNSS** field.



This setting must be done for BOSCH IPS Standard (With Display) systems.

▪ BOSCH Manual of NMEA Settings (GPS)

• Trimble (GFX-750/TMX-2050) - Part II

3. Click on **Edit** button.



4. Click on the **NMEA Messaging system.**



▪ BOSCH Manual of NMEA Settings (GPS)

• Trimble (GFX-750/TMX-2050) - Part III

5. Enable **NMEA Messaging**;
6. Message rate: **10 Hz**.
7. Outlet door: Depends on where the harness was connected (AutoPilot or Antenna).
8. Transmission rate: Select **38400**;
9. Message selection: **Enable GGA and VTG.**

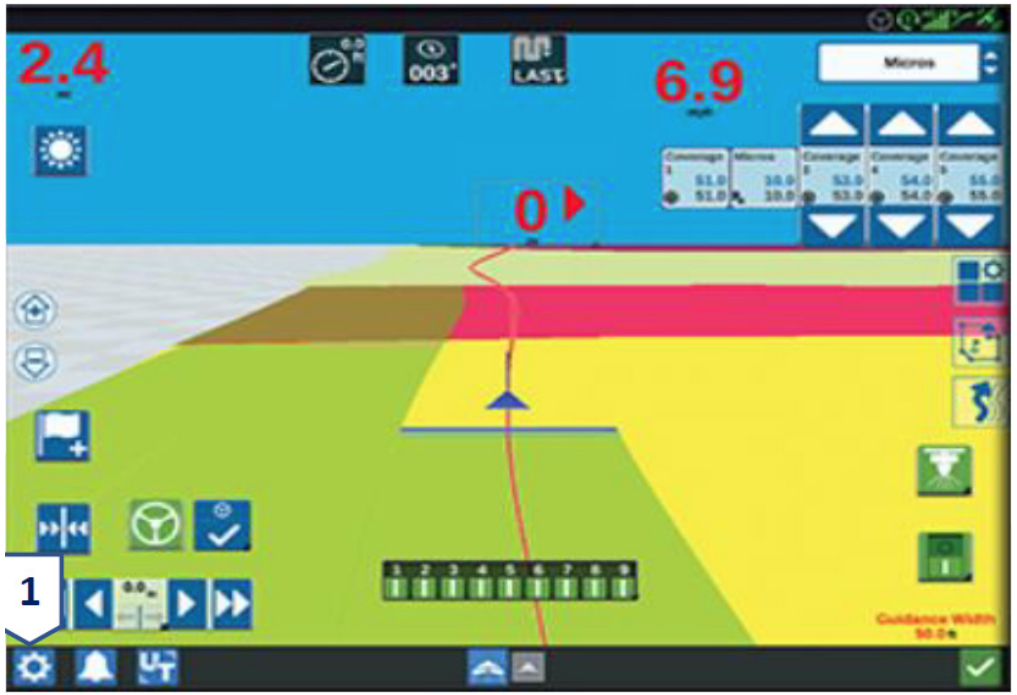


At the end click on ✓SAVE.

▪ BOSCH Manual of NMEA Settings (GPS)

• Raven (Series CRX) - Parte I

1. Click on the gear icon to access the menu.



2. Click on the **Serial Port** icon.

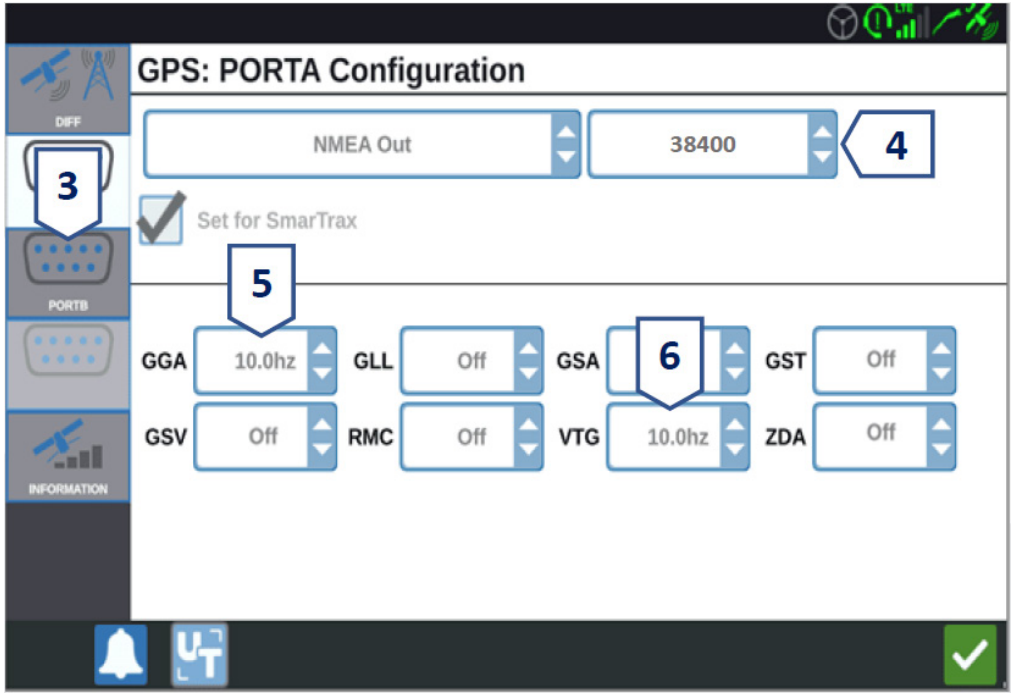


This setting must be done for BOSCH IPS Standard (With Display) systems.

▪ BOSCH Manual of NMEA Settings (GPS)

• Raven (Series CRX) - Part II

3. Click on the Port B icon (Port A is not editable as it is associated with the antenna);
4. Set the **NMEA Out** option to **38400**.
5. Configure **GGA** com **10 Hz**.
6. Set **VTG** to **10 Hz**.



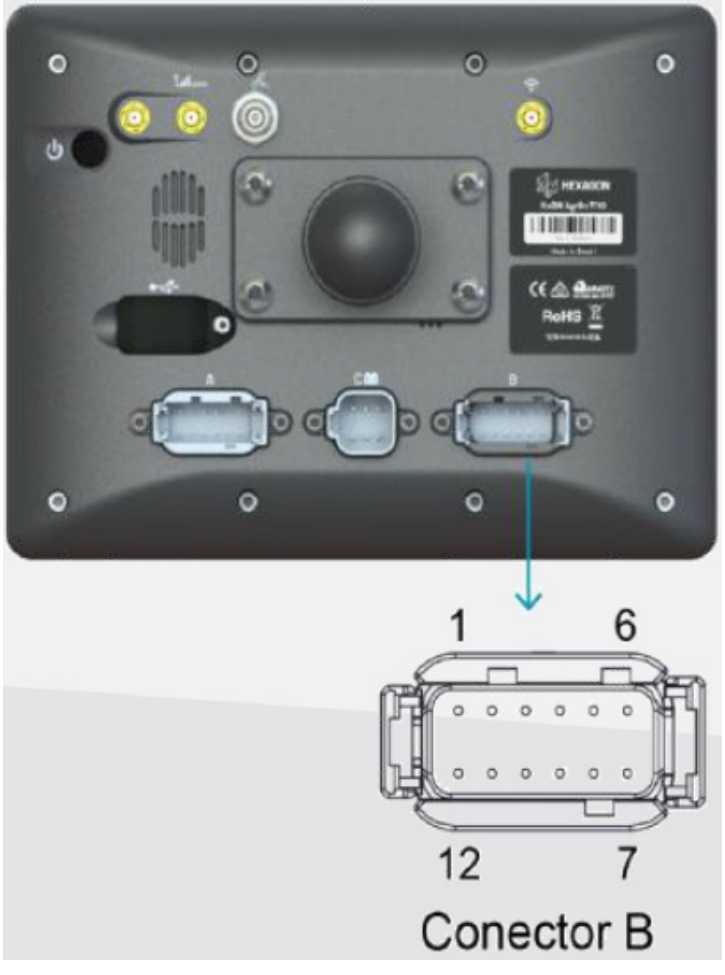
Press ✓ to complete the settings.

▪ BOSCH Manual of NMEA Settings (GPS)

• Hexagon (TI7 and TI10) - Part I

Connector B

1. Voltage Output
2. Sensor input M
3. Horn output signal
4. Sensor input A
5. Voltage output
6. Serial 2 RS232 TX
7. GND
8. Serial 2 RS232 RD
9. Analog output 2
10. Analog output 1
11. GND
12. Sensor input P
13. Entrada sensor P



1. Use Display Connector B to get NMEA messages with an appropriate harness.

▪ BOSCH Manual of NMEA Settings (GPS)

• Hexagon (TI7 and TI10) - Part II

Drag the work screen following the arrow indication to access the side menu.

1. Click on the gear icon to access the menu.



2. Click on **GNSS** icon.



This setting must be done for BOSCH IPS Standard (With Display) systems.

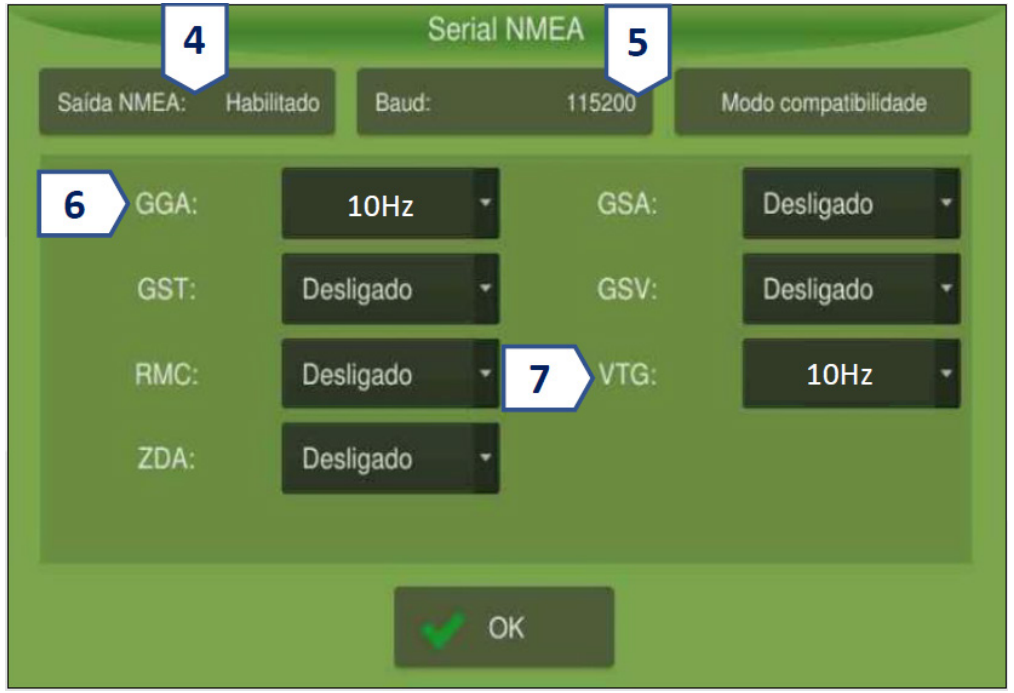
▪ BOSCH Manual of NMEA Settings (GPS)

• Hexagon (TI7 and TI10) - Part III

3. Click on **NMEA Outlet** icon;



4. In the **NMEA Output** option, select **Enabled**.
5. In the Baud option, select the **38400** option.
6. Set **GGA, On**.
7. Configure **VTG, On.**



Press ✓ OK to complete the settings.

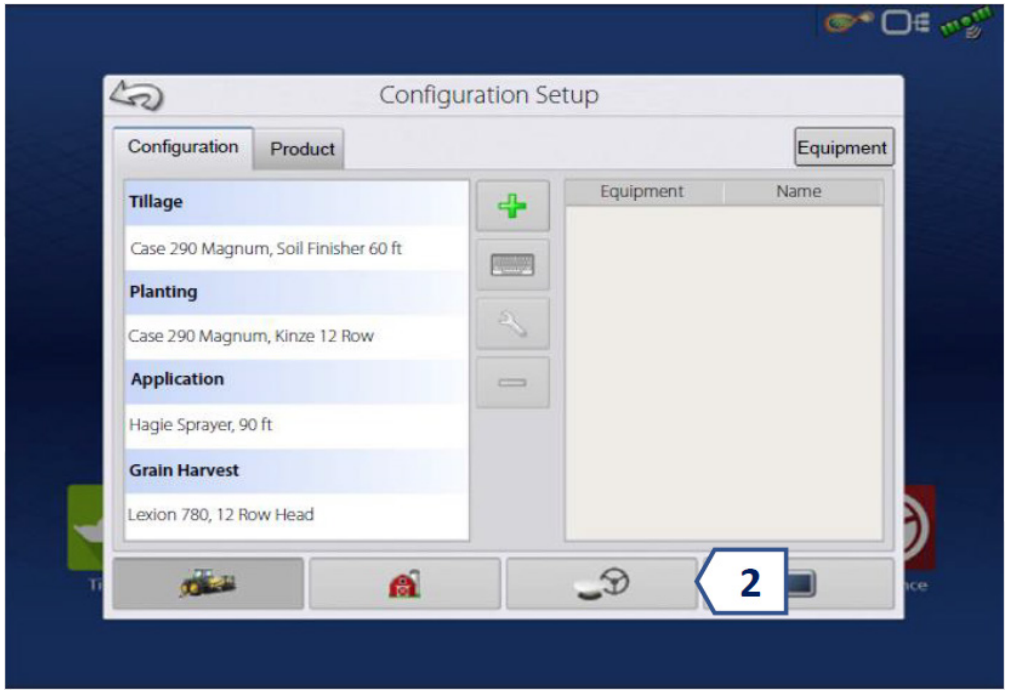
▪ BOSCH Manual of NMEA Settings (GPS)

• AG Leader (InCommand 800) - Part I

1. Click the **Setup** button to access the settings.



2. Click on the **GPS** icon to access its settings.



This setting must be done for BOSCH IPS Standard (With Display) systems.

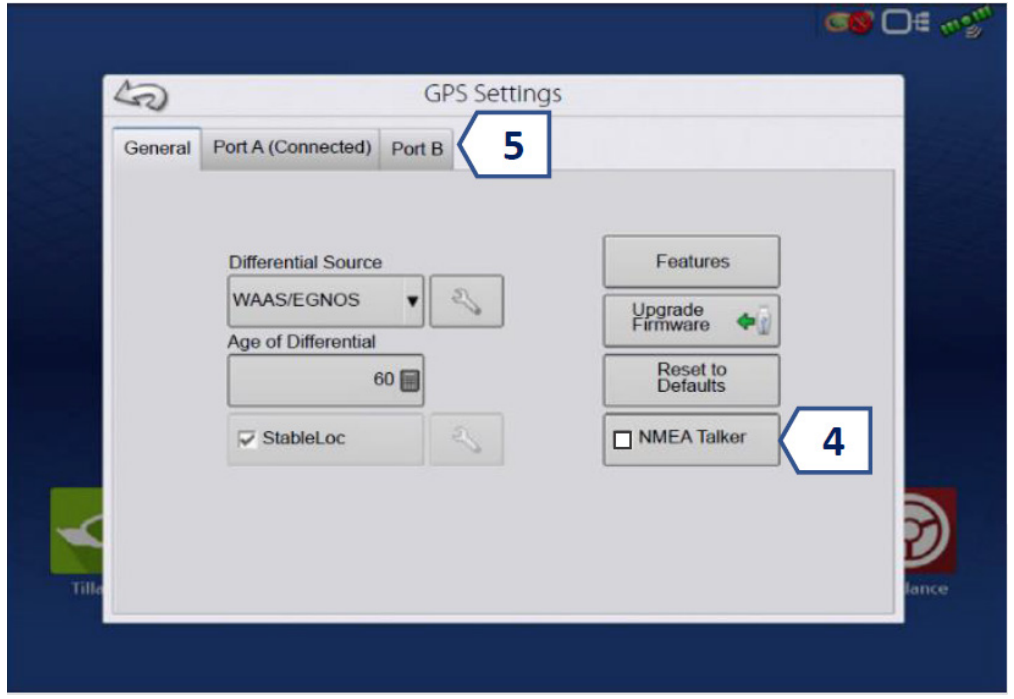
▪ BOSCH Manual of NMEA Settings (GPS)

• AG Leader (InCommand 800) - Part II

3. Click the wrench icon to access the antenna settings.



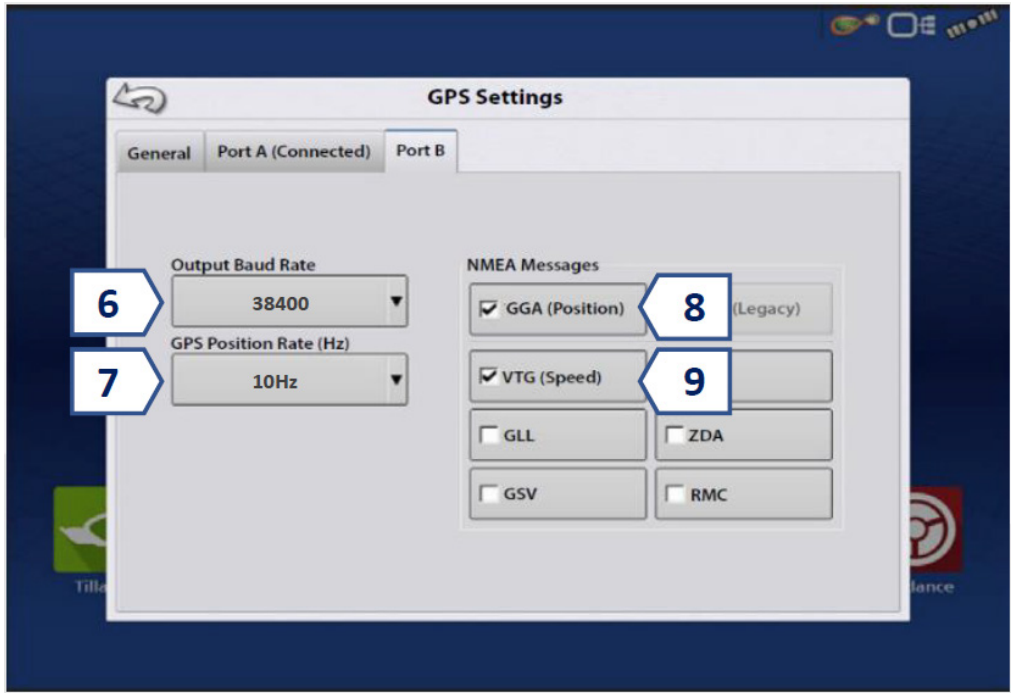
4. Disable **NMEA Talker** to release messages;
5. Click on the **Port B** tab to configure the messages.



▪ BOSCH Manual of NMEA Settings (GPS)

• AG Leader (InCommand 800) - Part III

6. In the **Output Baud Rate** option, select **38400**.
7. In the **GPS Position Rate (HZ)** option, select **10 Hz**.
8. Enable message **GGA**.
9. Enable message **VTG**.

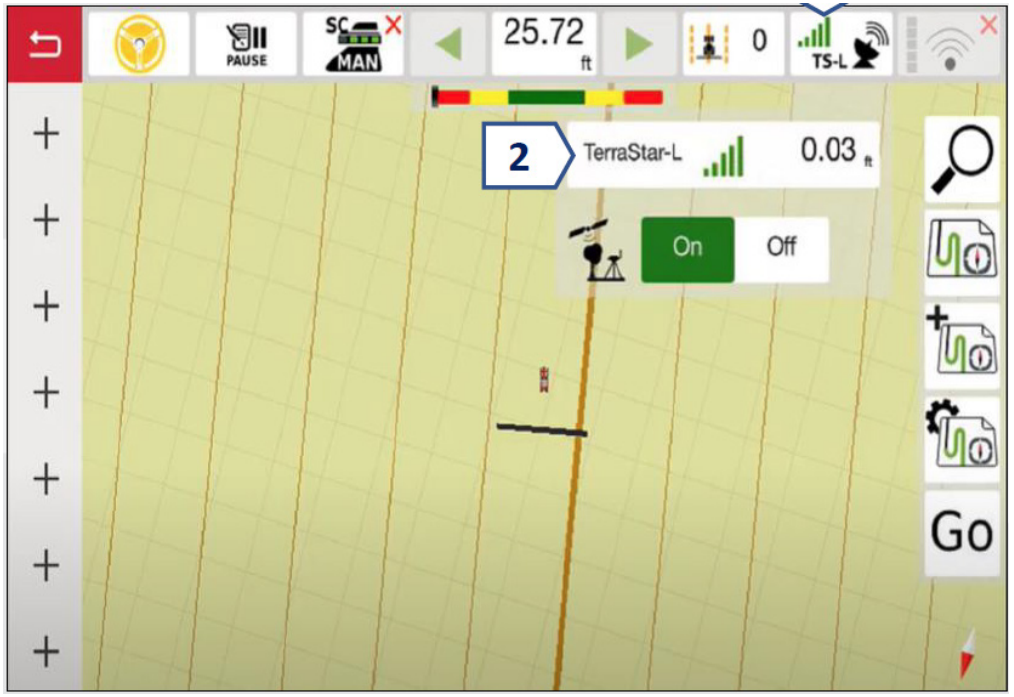


Press  **to complete the settings.**

▪ BOSCH Manual of NMEA Settings (GPS)

• Massey Ferguson (Datatronic 5) - Part I

1. Click on the GNSS antenna area in the display header;
2. Click on the frame where it shows the antenna accuracy.



3. Click on the **NMEA** section on the right side of the display;



This setting must be done for BOSCH IPS Standard (With Display) systems.

▪ BOSCH Manual of NMEA Settings (GPS)

• Massey Ferguson (Datatronic 5) - Part II

4. Enable the signal, leaving it **ON**;
5. In the **Baud Rate** option, select **38400**.
6. Enable **GGA** message with **10 Hz** baud rate.
7. Enable **VTG** message with **10 Hz** throughput.



Press OK to complete the settings.

Identification

• Identification plate

To see the parts catalog or request technical assistance from Baldan, always indicate the model (01), serial number (02) and date of manufacture (03), which can be found on the nameplate of your **TOPOGRAFIC AIR - BOSCH**.



⚠ ATTENTION

Os desenhos contidos nesse Manual de Instruções, são de caráter ilustrativo. Para possibilitar uma melhor visão e instrução detalhada, alguns desenhos neste manual, foram removidos os dispositivos de segurança (tampas, proteções, etc.). Nunca opere a semeadora sem estes dispositivos.

CONTACT

Em caso de dúvidas, nunca opere ou manusei o seu equipamento sem consultar o Pós Venda.
Telefone: 0800-152577
e-mail: posvenda@baldan.com.br

PUBLICATIONS

Code: 60550109258 | CPT: SPTGB08421A

• Product Identification

Make the correct identification of the data below, to always have information about the life of your seeder.

Owner: _____

Resale: _____

Farm: _____

City: _____

State: _____

Warranty Cert. No.: _____

Implement: _____

Serial No.: _____

Date of purchase: _____

Invoice: _____

PEÇAS® ORIGINAIS BALDAN
ORIGINAL PARTS • PIEZAS ORIGINALES

▪ Notes:

▪ Notes:

▪ Baldan Warranty

BALDAN IMPLEMENTOS AGRÍCOLAS S/A, guarantees the normal operation of the implement to the retailer for a period of 6 (six) months of the date of delivery in the resale invoice to the first end consumer. During this period **BALDAN** undertakes to repair material and/or manufacturing defects of its responsibility, with labor, freight and other expenses being the responsibility of the reseller.

During the warranty period, the request and replacement of any defective parts must be made to the regional dealer, who will send the defective part for analysis at BALDAN.

When such procedure is not possible and the reseller has exhausted its resolution capacity, it will request support from **BALDAN Technical Assistance**, through a specific form distributed to resellers. After analyzing the items replaced by BALDAN's Technical Assistance, and concluded that, it is not about warranty, then it will be the responsibility of the dealer the replacement-related costs; as well as costs of materials, travel including accommodation and meals, accessories, lubricant and other expenses resulting from the service call, being BALDAN authorized to make the billing on behalf of resale. Any repairs made to the product within the warranty period by the retailer will only be authorized by **BALDAN** upon prior quotation describing parts and labor to be performed.

This term excludes products that undergo repairs or modifications to workshops not belonging to the **BALDAN** retailer network, as well as the application of non-genuine parts or components to the user's product. This warranty shall be rendered void when it is found that the defect or damage is the result of improper use of the product, failure to follow instructions or operator inexperience.

It is agreed that this warranty does not cover tires, deposits of polyethylene, cardans, hydraulic components, etc., which are equipment guaranteed by their manufacturers. Manufacturing and or material defects, object of this warranty term, will not constitute, under any circumstances, reason for purchase and sale contract termination or compensation of any nature.

BALDAN reserves the right to change and or improve the technical characteristics of its products, without prior notice, and without obligation to do so with previously products manufactured.

▪ Inspection and delivery certificate

SERVICE BEFORE DELIVERY: This implement has been carefully prepared by the sales organization and inspected in its entirety in accordance with the manufacturer's requirements.

DELIVERY SERVICE: The user has been informed of the current warranty terms and instructed on the use and maintenance care.

I confirm that I have been informed of the current warranty terms and instructed on the proper use and maintenance of the implement.

Implement: _____ Serial No.: _____

Date: _____ Invoice No.: _____

Resale: _____

Phone: _____ Zip Code: _____

City: _____ State: _____

Owner: _____

Phone: _____

Address: _____ Number: _____

City: _____ State: _____

E-mail: _____

Date of sale: _____

Signature / Stamp of Resale _____

1st counterpart - Owner

▪ Inspection and delivery certificate

SERVICE BEFORE DELIVERY: This implement has been carefully prepared by the sales organization and inspected in its entirety in accordance with the manufacturer's requirements.

DELIVERY SERVICE: The user has been informed of the current warranty terms and instructed on the use and maintenance care.

I confirm that I have been informed of the current warranty terms and instructed on the proper use and maintenance of the implement.

Implement: _____ Serial No.: _____

Date: _____ Invoid No.: _____

Resale: _____

Phone: _____ Zip Code: _____

City: _____ State: _____

Owner: _____

Phone: _____

Address: _____ Number: _____

City: _____ State: _____

E-mail: _____

Date of sale: _____

Signature / Stamp of Resale _____

2nd counterpart - Resale

▪ Inspection and delivery certificate

SERVICE BEFORE DELIVERY: This implement has been carefully prepared by the sales organization and inspected in its entirety in accordance with the manufacturer's requirements.

DELIVERY SERVICE: The user has been informed of the current warranty terms and instructed on the use and maintenance care.

I confirm that I have been informed of the current warranty terms and instructed on the proper use and maintenance of the implement.

Implement: _____ Serial No.: _____

Date: _____ Invoice No.: _____

Resale: _____

Phone: _____ Zip Code: _____

City: _____ State: _____

Owner: _____

Phone: _____

Address: _____ Number: _____

City: _____ State: _____

E-mail: _____

Date of sale: _____

Signature / Stamp of Resale _____

3rd copy - Manufacturer (Please send completed within 15 days)

1.74.05.0059-5

AC MATÃO
ECT/DR/SP

RESPONSE CARD

NO STAMPING REQUIRED

THE STAMP WILL BE PAID BY:

BALDAN

BALDAN IMPLEMENTOS AGRÍCOLAS S/A.

Av. Baldan, 1500 | Nova Matão | Zip Code: 15993-900 | Matão-SP | Brazil

Phone: (016) 3221-6500 | Fax: (0**16) 3382-6500**

Home Page: www.baldan.com.br | e-mail: sac@baldan.com.br

Export: Phone: 55 16 3321-6500 | Fax: 55 16 3382-4212 | 3382-2480

e-mail: export@baldan.com.br

BALDAN

Avenida Baldan, 1500
Nova Matão
15.993-900
Matão/SP - Brasil
sac@baldan.com.br
export@baldan.com.br

+55 16 3221 6500
baldan.com.br