TATU

MARCHESAN

INSTRUCTIONS MANUAL

ULTRA FLEX

IDENTIFICATION

Dealer: _____

Owner: _____

Firm / Farm: _____

City: _____ State: _____

No. of the Certificate of Guarantee: _____

Serial / No.: _____

Date: ____ / ____ / ____ Invoice No.: _____

Product: _____

Notes: _____

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Introduction

Ultra Flex and Ultra Flex Suprema planters are specially designed to perform no-till or conventional planting of corn, soybean, rice, bean, peanut, delinted cotton, sorghum and others with superior quality.

The Ultra Flex planter performs a precise plantation using perforated or slotted seed plates for many cultures.

The Ultra Flex Suprema planter performs the seed metering through the vacuum seed meter, which has an exclusive seal system that assures a greater lifetime and easier operation. The vacuum blower activation can be made by the cardan shaft with constant-velocity joint or hydraulic motor.

Equipped with a fertilizer metering that has an auger with internal coating, which ensures a greater precision and uniformity in the metering process.

The different amount of fertilizer and seeds is easily adjusted by the sprocket combinations with fast shifting (TRA).

The seed depth control is made by the oscillating rubber wheels, which follow the soil profile and benefit the emergence of plants equally.

This instructions manual contains the necessary information for the best performance of this planter. The operator must carefully read the entire manual before working with the equipment. Also, read and understand the safety recommendations.

For any further clarification or in the event of technical problems that may arise during the service, consult or dealer and the Technical Support department of the factory. They can ensure the fully functioning of your TATU planter.

TATU
MARCHESAN

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To the owner

The acquisition of any Tatu product assures to the original purchaser the following rights:

- Warranty certificate;
- Instructions manual;
- Technical assistance by the dealer on equipment delivery.

However, the owner must check the condition of the equipment on delivery, as well as knowing the warranty terms.

Special attention should be given to the safety recommendations, operation precautions and maintenance of the equipment.

The instructions in this manual indicates how to get the best performance and allow the operator to get maximum income, increasing the equipment lifetime.

This manual should be read by operators and maintenance staff.

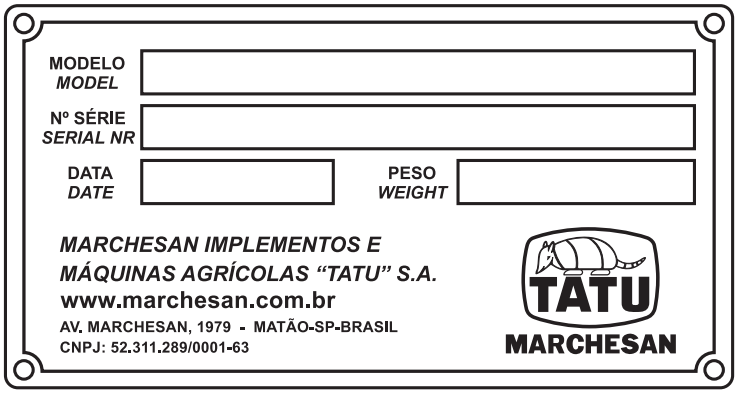
Important

- **Only people who own a full knowledge of the tractor and equipment must operate them;**
- **Marchesan is not responsible for any damage caused by accident on transporting, incorrect utilization or inadequate storage, either by negligence and/or lack of experience from any person;**
- **Marchesan is not responsible for any damage caused by unpredictable situations or the incorrect use of the equipment.**

General information

Right and left hand side indication are made observing the equipment from the rear.

To order any parts or request technical assistance services, it is required to provide the data contained on the nameplate, which is located on the equipment frame.



NOTE **The warranty shall not be applied to any equipment or any part thereof which has been altered elsewhere than at the place of manufacture or which the original purchaser thereof at retail has used or allowed to be used parts, not made or supplied by Marchesan S/A.**

To the operator

Be careful with the environment

Dear user!

Respect the ecology. Do not throw trash away. This gesture of goodwill helps to protect our environment.

Products such as oil, fuel, filters, batteries and others are spilled to the soil and can penetrate to the underground layers, compromising nature. Ecological and conscious disposal of them should be done.

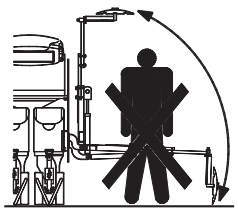
Working safely

- **Security aspects must be carefully observed to avoid accidents.**
- **This symbol is a warning used to prevent accidents.**
- **The instructions under this symbol refers to the safety of the operator or third parties, therefore it should be carefully read and observed.**

ULTRA Flex and ULTRA Flex Suprema are easy planters to operate, requiring however the basic and essential cautions to its handling.

Always keep in mind that safety requires constant attention, observation and prudence during the planting, transportation, maintenance and storage.

Read and understand the information before making any adjustment or maintenance.



Before activating the equipment, check if there are no people or animals on the row operation area or over the equipment.

Have extreme caution when operating with the power take-off (PTO). Do not get closer during operation.

To the operator

Never use your bare hands to check hydraulic leaks, the high pressure can cause several injuries.

Never attempt to change the adjustments, clean or lubricate the equipment when the same is switched on or in movement.

Be careful while driving on slopes. Risk of overturn.

Prevent that chemical products (i.e.: fertilizers, treated seeds) make any contact with your skin or clothes.

Keep access and work places clean and free from oil and grease. Risk of accidents.

Never transport the equipment on highways or paved roads during the night. Avoid that the tractor wheels touch the drawbar in sharp turns.

The presence of any other people on the tractor or equipment is stricly forbidden.

Have extreme caution when driving under electrical power lines. Any contact may result in severe shocks, injuries or death.

For your protection and safety, always wear adequate clothes and footwear while operating the equipment.

Always use the safety locks to transport the equipment.

To the operator

- Only trained and qualified personnel is allowed to operate the equipment.
- While working or during transportation, only the presence of the operator is allowed on the tractor.
- Do not allow children to play near or over the equipment while it is operating, during transportation or storage.
- Have full knowledge of the soil before starting to work. Use the speed which is suitable to the conditions of the ground or pathways to be covered. Provide the delineation of obstacles or hazardous locations.
- Use personal protective equipment (PPE).
- Wear appropriate clothes and footwear. Avoid clothes that are either loose or hanging from the body, which may become entangled in moving parts.
- Never operate the equipment without its proper **protective device**s.
- Be careful while hitching the equipment to the tractor.
- Wear protective gloves to work near the coulter blades.
- When raising or lowering the planter, check if there are no people or animals close or under it.
- Never attempt to change the adjustments, clean or lubricate the equipment while it is moving.
- In case of emergency, know how to stop the tractor and planter quickly.
- Always shut down the engine, remove the key and use the handbrake before leaving the tractor seat.
- Only pull the equipment using tractors with appropriate power.
- Carefully check the transport width on narrow locations.
- Whenever you unhitch the equipment, either in the field or shed, do it on a flat and firm surface and use the parking stands. Make sure the equipment is properly supported.
- Please check the general safety instructions on the back cover of this manual.

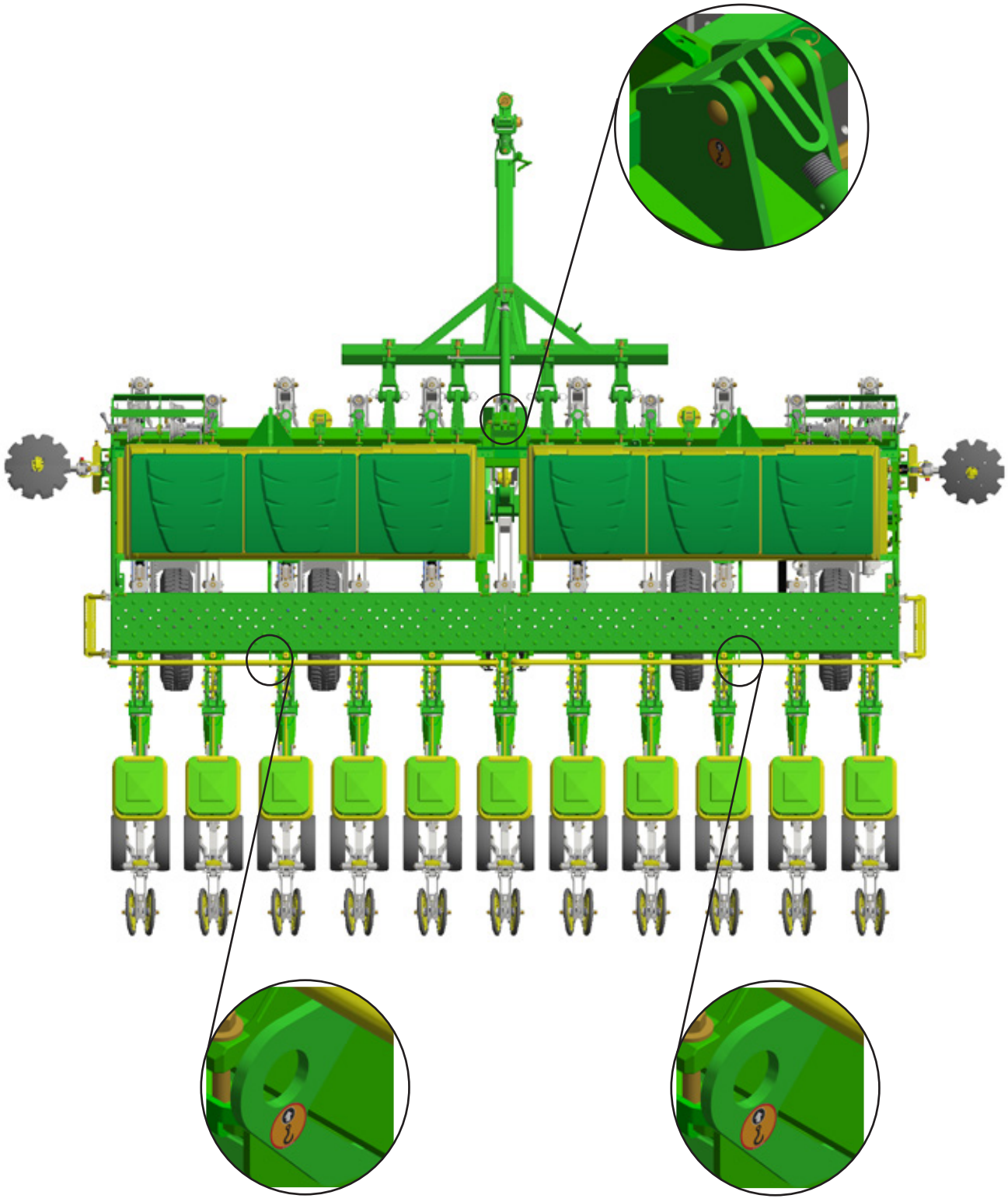
Truck or trailer transportation

Marchesan does not advise the equipment traffic on highways, because this practice involves serious security risks in addition to being prohibited by the current existing traffic law. The transportation for long distances should be done on truck, trailer or others by following these safety guidelines:

- Use adequate ramps to load or unload the equipment. Do not make the loading on ditch banks, it can cause a serious accident.
- When lifting with a hoist, use the appropriate points to lift.
- Underpin the equipment wheels appropriately.
- Use the parking stands to support the equipment properly.
- The drawbar must be lifted and locked in vertical position or removed and fastened to the load.
- Fasten the hopper lids and other moving parts that may get loose and cause accidents.
- Use chock blocks and safety chains to secure the equipment to the truck or trailer during the transport.
- After 8 to 10 km transporting, please inspect the load condition. Repeat this procedure every 80 to 100 km. Give more attention when transporting the equipment on rough roads, slopes and other adverse conditions.
- Always be careful with the load height, especially when passing under electrical power lines, bridges and others.
- Check all laws and regulations regarding the height limits and load width while transporting the equipment on truck or trailer. If necessary use banners, lights and other devices in order to give adequate warning to the other drivers.

Lifting points

ULTRA FLEX and ULTRA FLEX SUPREMA planters have adequate lifting points, being two in the rear and one in the front part of the equipment. When lifting with a hoist, it is essential to hitch the cables to these points.



Safety stickers

The safety stickers warn about the equipment points that require more attention and they should be kept in good repair. If these stickers become damaged or illegible, replace them. Marchesan provide stickers, upon request and indication of the respective serial number.

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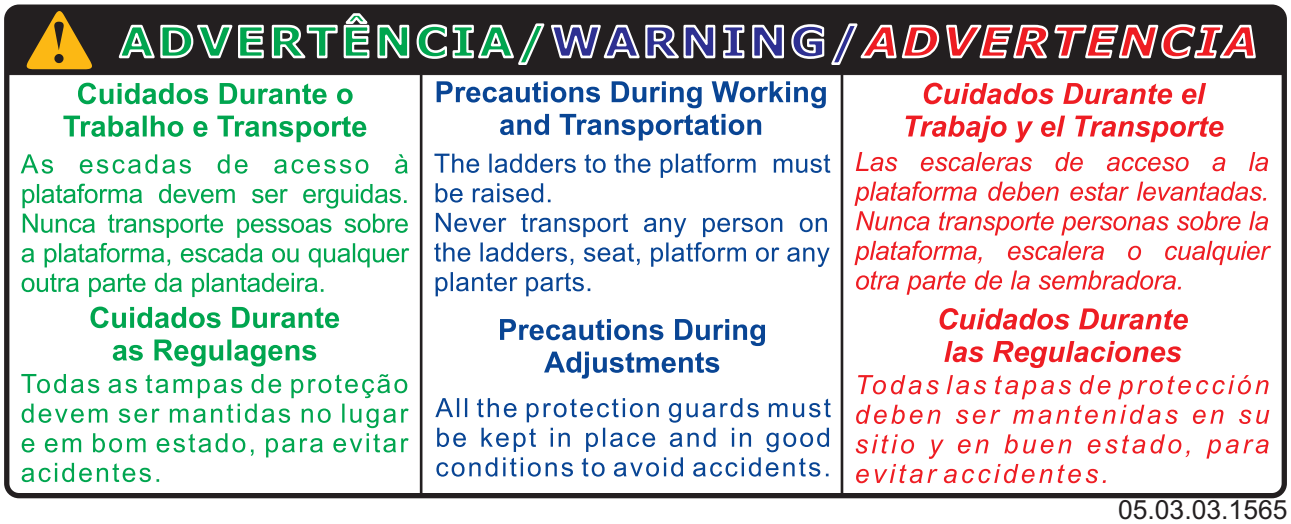

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Safety stickers

05.03.03.1566

05.03.03.1425

05.03.03.1424

Adhesive label

Model	Serial number	Serial number	Serial number
ULTRA FLEX	05.03.03.3853 Small logo	05.03.03.3854 Big logo	05.03.03.3872 ULTRA FLEX logo

Technical specifications

Number of row units	Working width (mm)	Transport width (mm)	Hoppers capacity		Net weight (kg)		Power (cv) on tractor engine* 1 (2)
			Fertilizer (L./kg)	Seeds (L./kg)	Ultra Flex	Ultra Flex Suprema	
4045							
4	3700	4420	1120	200 (160)	3366	3424	75 - 90 (100 - 115)
5				250 (200)	3500	3686	
6				300 (240)	3857	3987	
7				350 (280)	3973	4178	
8				400 (320)	4097	4385	
9				450 (360)	4649	4802	
4495							
5	4050	5805	1300	250 (200)	2690	2748	95 - 110 (120 - 140)
6				300 (240)	3060	3246	
7				350 (280)	3430	3560	
8				400 (320)	3800	4005	
9				450 (360)	4170	4458	
10				500 (400)	4540	4693	
4845							
5	4500	5320	1540	250 (200)	4190	4390	95 - 110 (120 - 140)
6				300 (240)	4245	4393	
7				350 (280)	4377	4620	
8				400 (320)	4497	4792	
9				450 (360)	5053	5178	
10				500 (400)	5103	5356	
11				550 (440)	5454	5631	

Technical specifications

Number of row units	Working width (mm)	Transport width (mm)	Hoppers capacity		Net weight (kg)		Power (cv) on tractor engine* 1 (2)
			Fertilizer (L./kg)	Seeds (L./kg)	Ultra Flex	Ultra Flex Suprema	
5745							
5	5400	6220	1730	250 (200)	4190	4390	110 - 125 (145 - 165)
7				350 (280)	4663	4860	
8				400 (320)	4785	5071	
9				450 (360)	5341	5491	
10				500 (400	5492	5635	
11				550 (440)	5700	5950	
12				600 (480)	6029	6174	
13				650 (520)	6252	6470	
6645							
8	6300	7120	1880	400 (320)	4966	5260	120 - 140 (170-195)
9				450 (360)	5387	5658	
10				500 (400)	5809	6057	
12				600 (480)	6439	6564	
13				650 (520)	6674	6890	
15				750 (600)	7234	7346	
7545							
10	7200	8020	2440	400 (320)	6252	6330	150 - 180 (200 - 230)
12				600 (480)	6410	6600	
14				700 (560)	7000	7376	
15				750 (600)	7473	7600	
17				850 (680)	8188	8562	

Technical specifications

Important information

Fertilizer distribution: 154 to 1131 kg/ha, 2" coil pitch auger (standard) / 75 to 549 kg/ha, 1" coil pitch auger (optional).

The width (on previous tables) is not including the marker discs.

Height (without marker discs): 1950 mm.

Length: 4740 mm.

Tires: 700 x 16 - 10 tarps - The correct inflation is important and it must be the same on all tires **(75 PSI).**

Ultra Flex 9, 10, 11 and 13 row units - **4 tires;**

Ultra Flex 15 and 17 row units - **6 tires.**

Every short row unit of fertilizer is on the **left**; short row unit of seed is on the **right.**

Every long row unit of fertilizer is on the **right**; long row unit of seed is on the **left.**

Whether the number of row units are even or odd, the first row unit of the left side will always be short if you see the planter from its rear. A planter that has an odd number of row units will always have an extra shorter row unit on one side. A planter that has an even number of row units will have the same leveling on both sides.

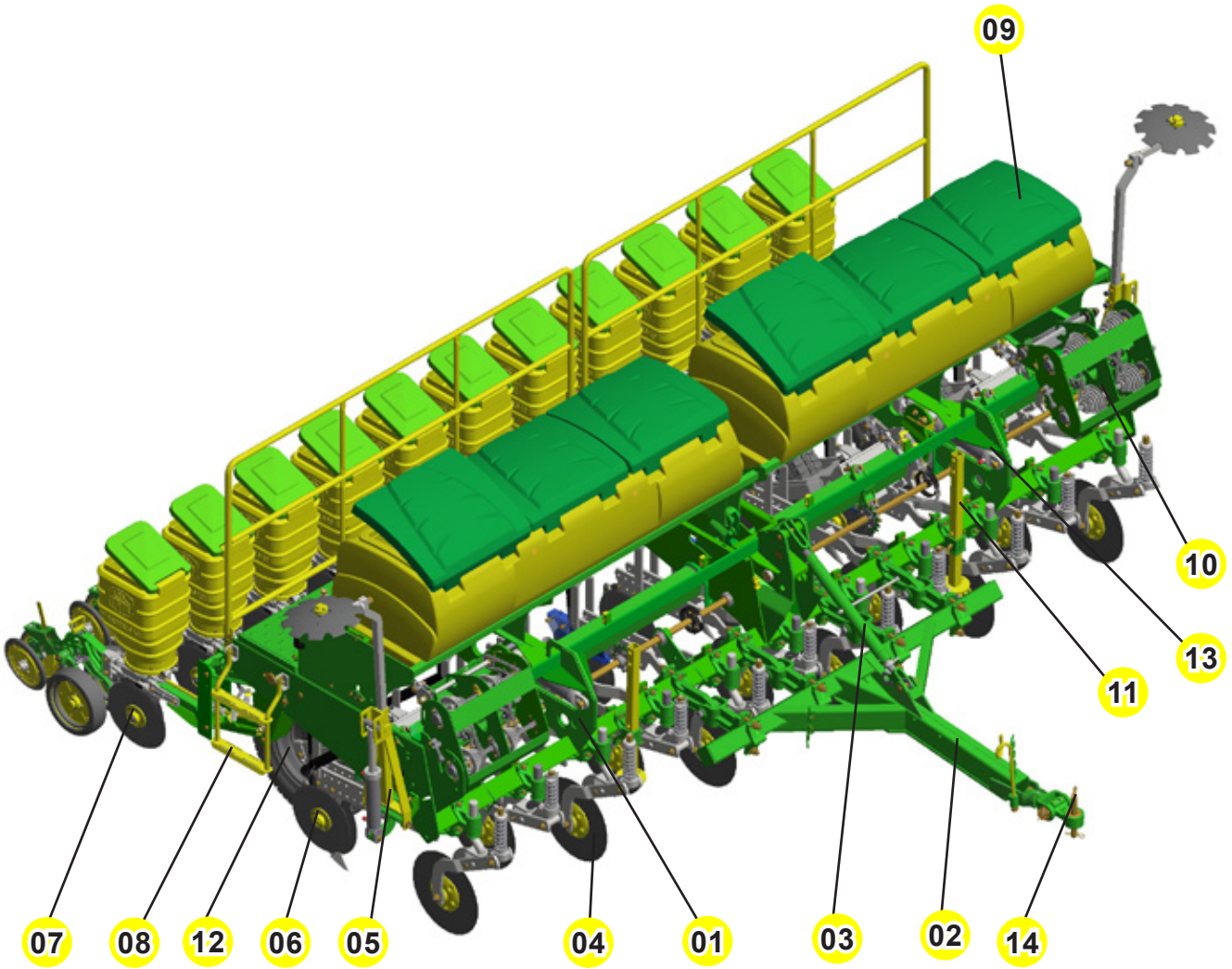
* Unalignment of the fertilizer row unit with scarifier spindle = **450 mm.**

* Power 1 - **Unaligned double discs.**

* Power (2) - **Scarifier spindle in the fertilizer.**

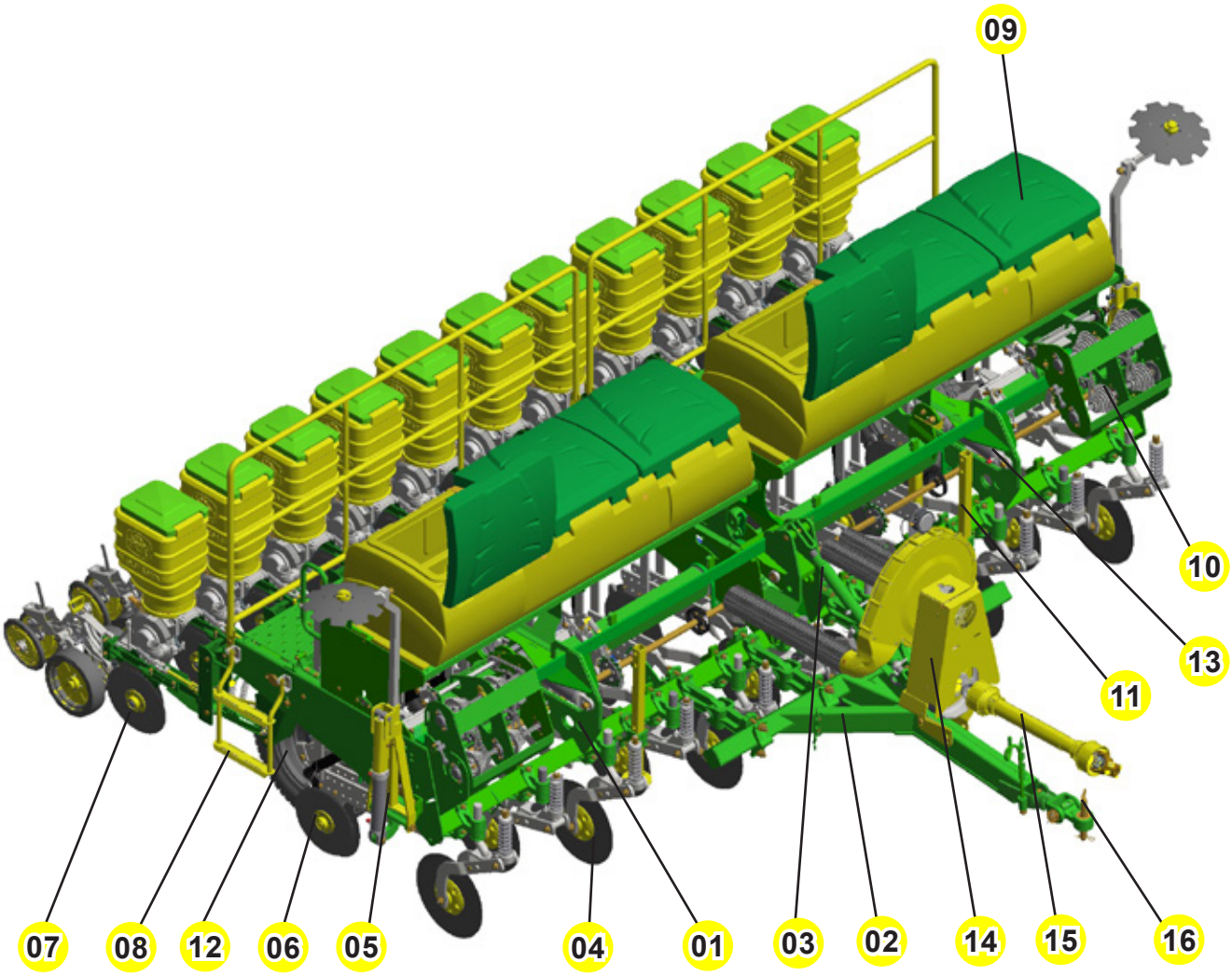
ULTRA FLEX

01 - Frame
02 - Drawbar
03 - Extensor
04 - Coulter blade
05 - Row marker
06 - Fertilizer row unit
07 - Seed row unit
08 - Ladder
09 - Fertilizer hopper
10 - Gearbox
11 - Parking stand
12 - Wheelset
13 - Hydraulic cylinder
14 - Tractor hitch



ULTRA FLEX SUPREMA

01 - Frame
02 - Drawbar
03 - Extensor
04 - Coulter blade
05 - Row marker
06 - Fertilizer row unit
07 - Seed row unit
08 - Ladder
09 - Fertilizer hopper
10 - Gearbox
11 - Parking stand
12 - Wheelset
13 - Hydraulic cylinder
14 - Blower
15 - Cardan shaft
16 - Tractor hitch



Assembly

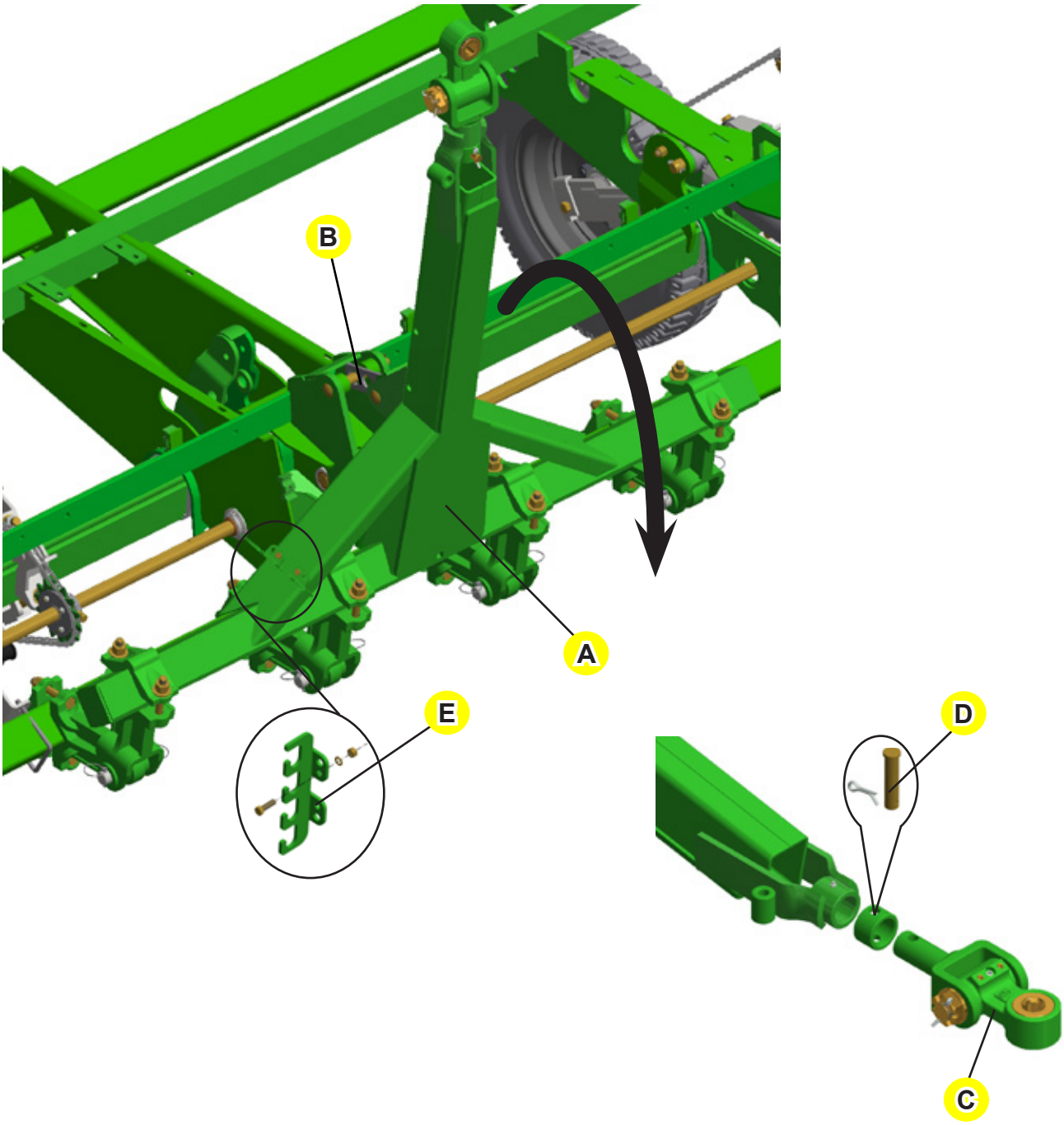
To facilitate transportation the planters leave the factory semi-assembled, being necessary just a few adjustments to start the job. Follow the instructions below:

Drawbar assembly

The drawbar (A) goes assembled and articulated. Lower it and remove the lock (B).

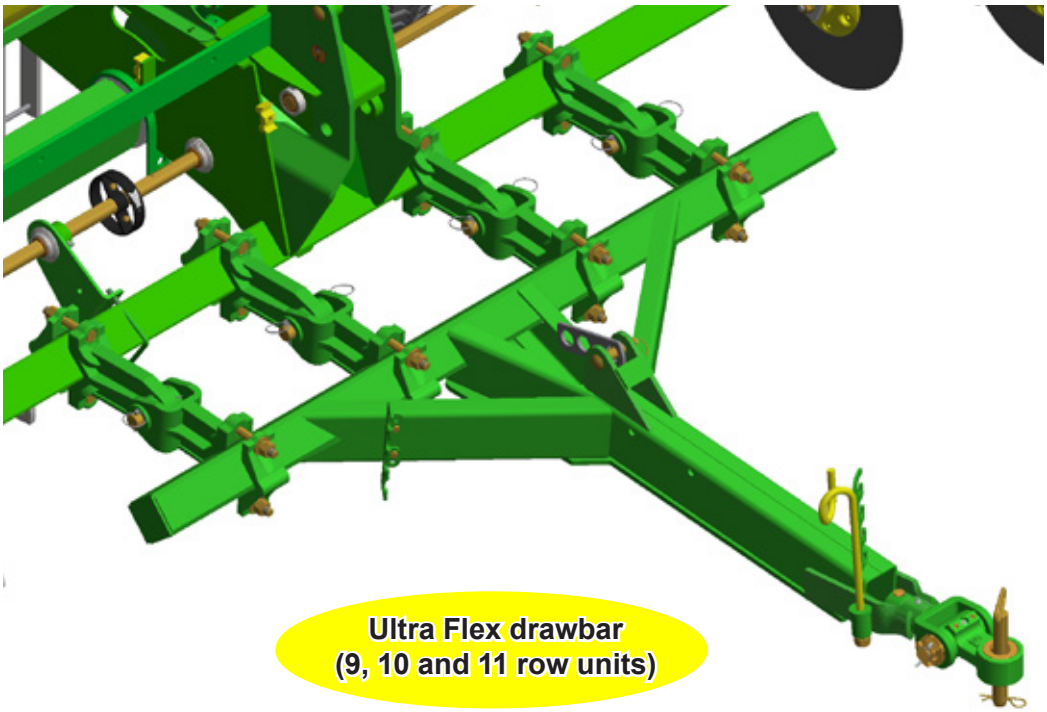
Then, assemble the parts found in the component box according to the instructions.

- Place the tractor hitch (C), using a pin (D) and cotter pin.
- Fasten the hose holder (E) to the drawbar using bolts, spring washers and nuts.

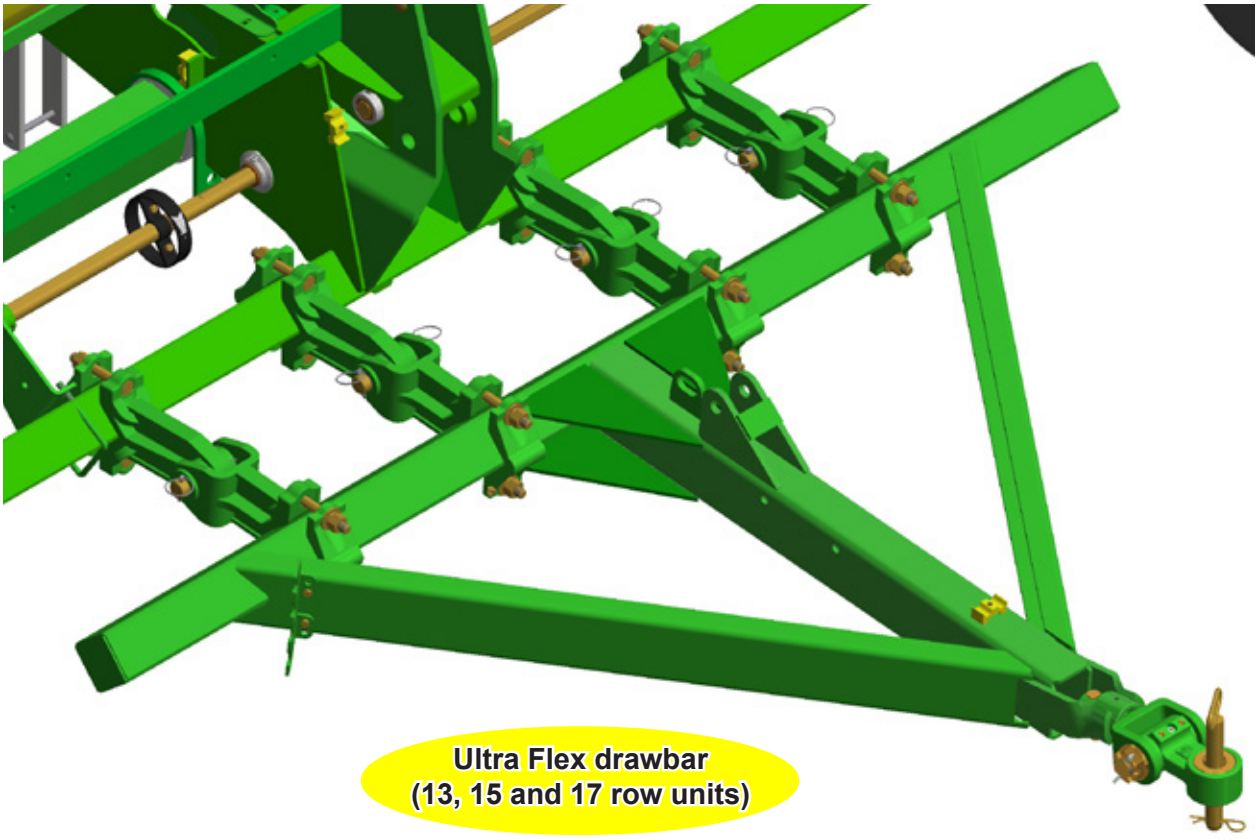


Drawbar assembly

To change the spacing, it is necessary to remove the drawbar completely. When placing it back again, its support must be as centered as possible, allowing a better weight distribution. Check the illustrations below:



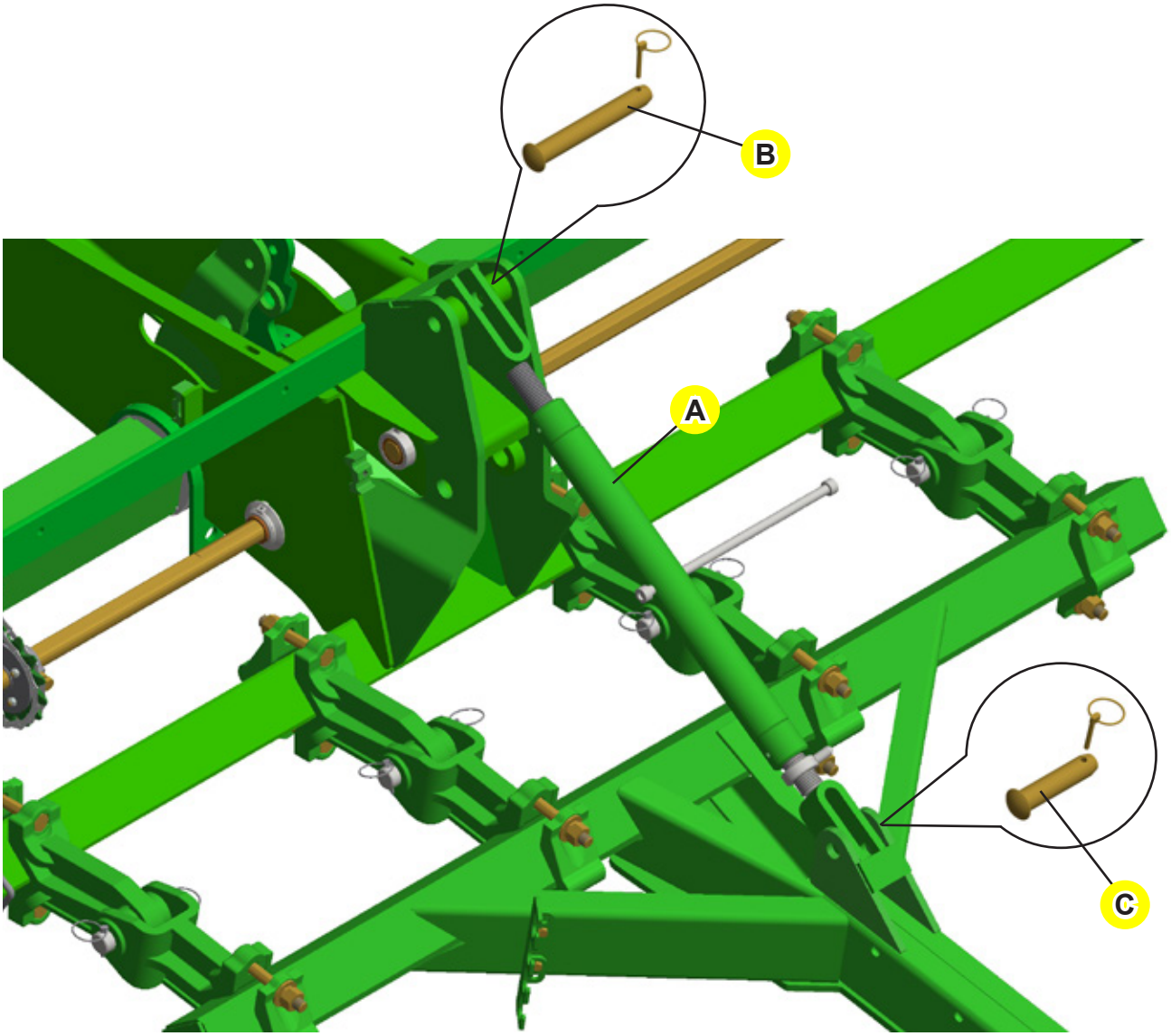
Ultra Flex drawbar
(9, 10 and 11 row units)



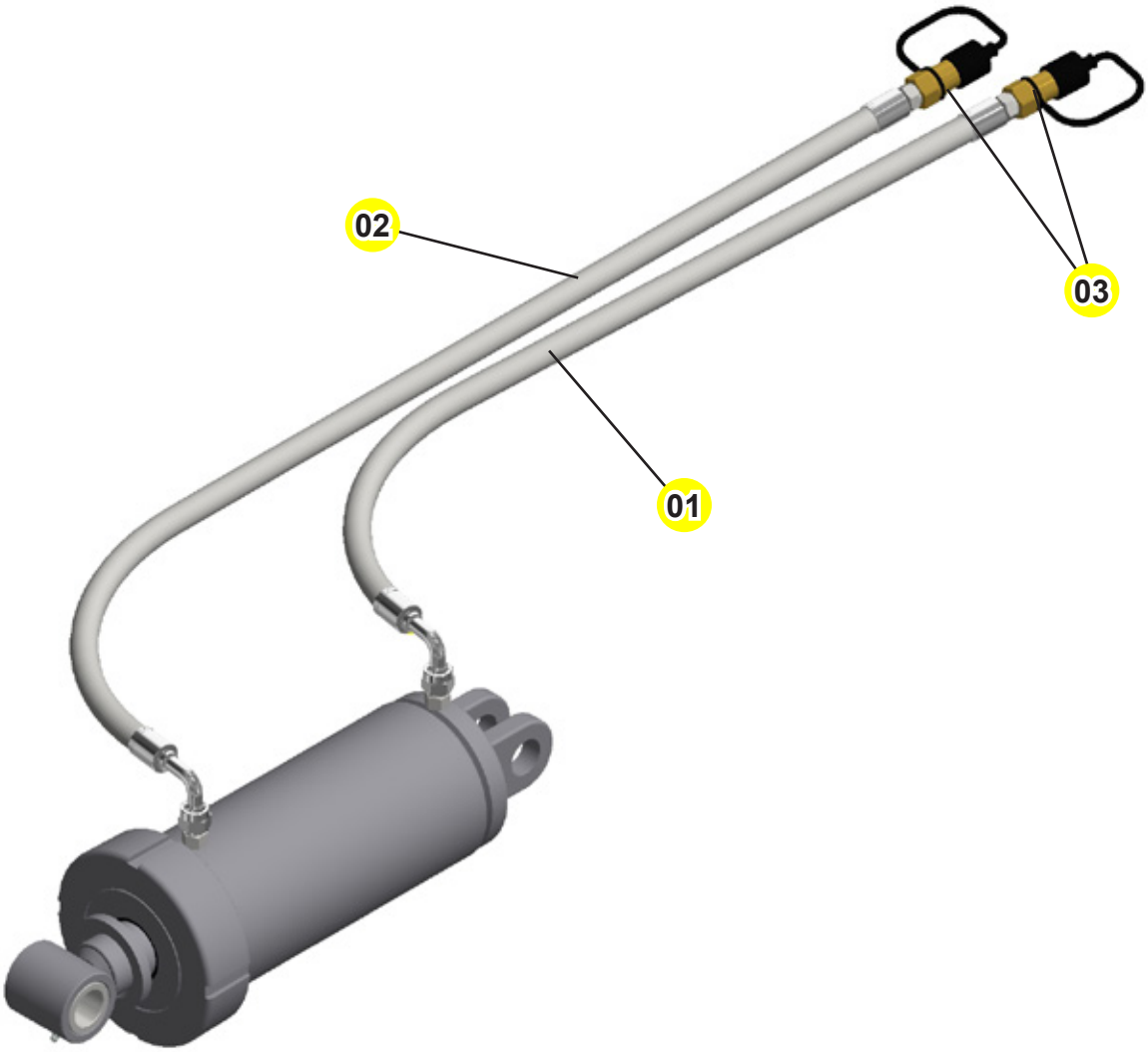
Ultra Flex drawbar
(13, 15 and 17 row units)

Extensor assembly

• After assembling the drawbar, assemble the extensor (A) to the frame and drawbar using the pins (B) and (C) and lock pin.

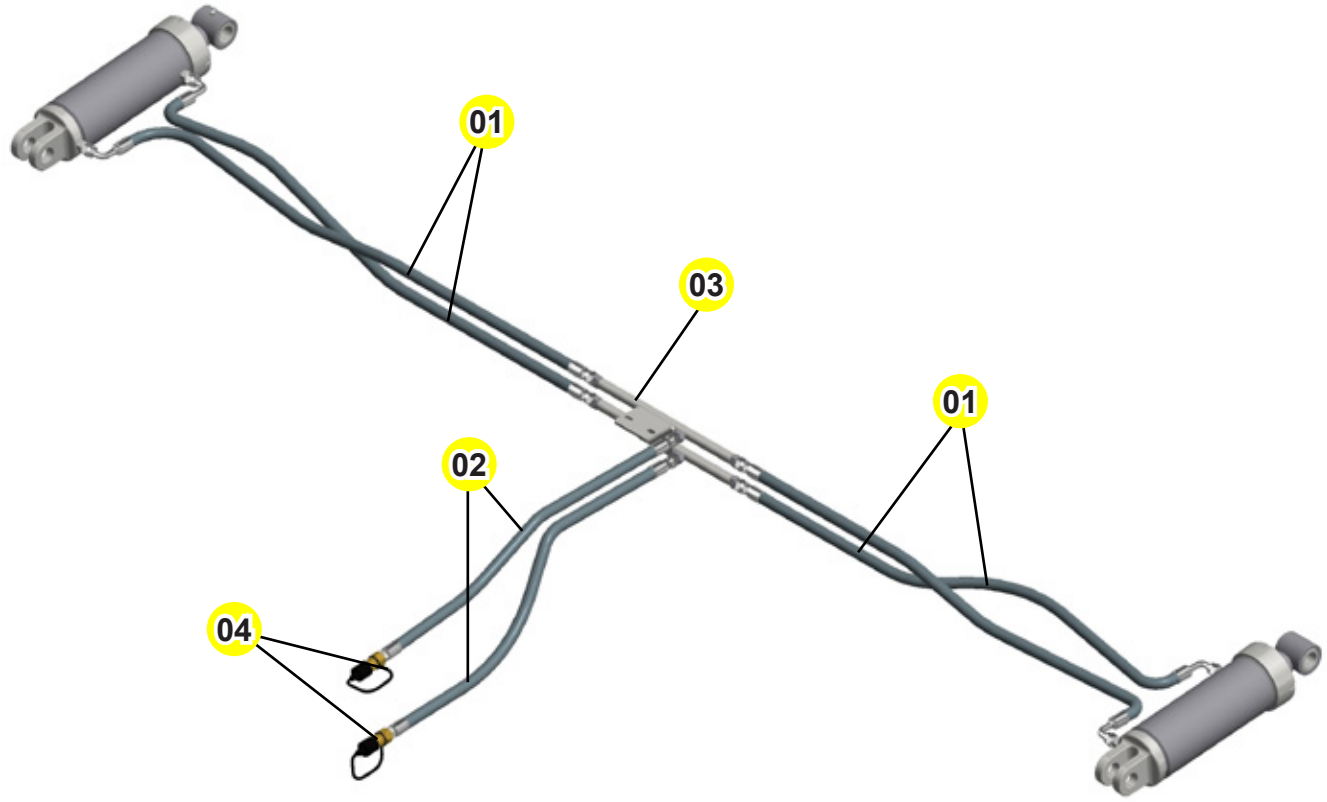


Hydraulic circuit (9 and 10 row units)



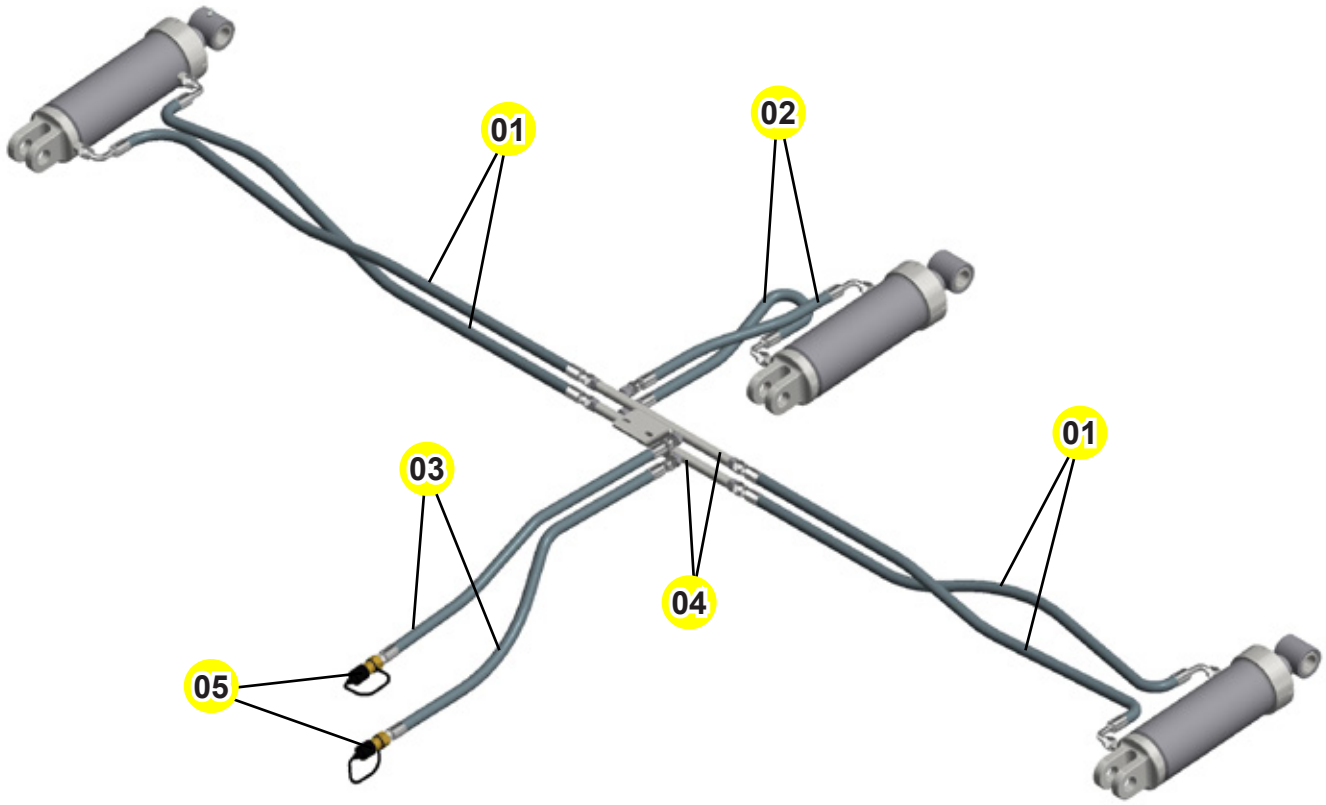
Item	Description	Quantity
01	3/8 x 4000 TC-TM hose	01
02	3/8 x 4300 TC-TM hose	01
03	Male quick coupler Agr 1/2 Npt w/ lid	02

Hydraulic circuit (11 and 13 row units)



Item	Description	Quantity
01	3/8"x 1700 TR - TC hose	04
02	3/8" x 4000 TR - TM hose	02
03	Oil conductor	01
04	Male quick coupler Agr 1/2" Npt w/ lid	02

Hydraulic circuit (15 and 17 row units)



Item	Description	Quantity
01	3/8" x 1700 TR - TC hose	04
02	3/8" x 600 TR - TC hose	02
03	3/8" x 4000 TR - TM hose	02
04	Oil conductor	01
05	Male quick coupler Agr 1/2" Npt w/ lid	02

Hydraulic row markers

Fasten the hydraulic row marker support (A) to the frame side using bolts (B), spring washers and nuts.

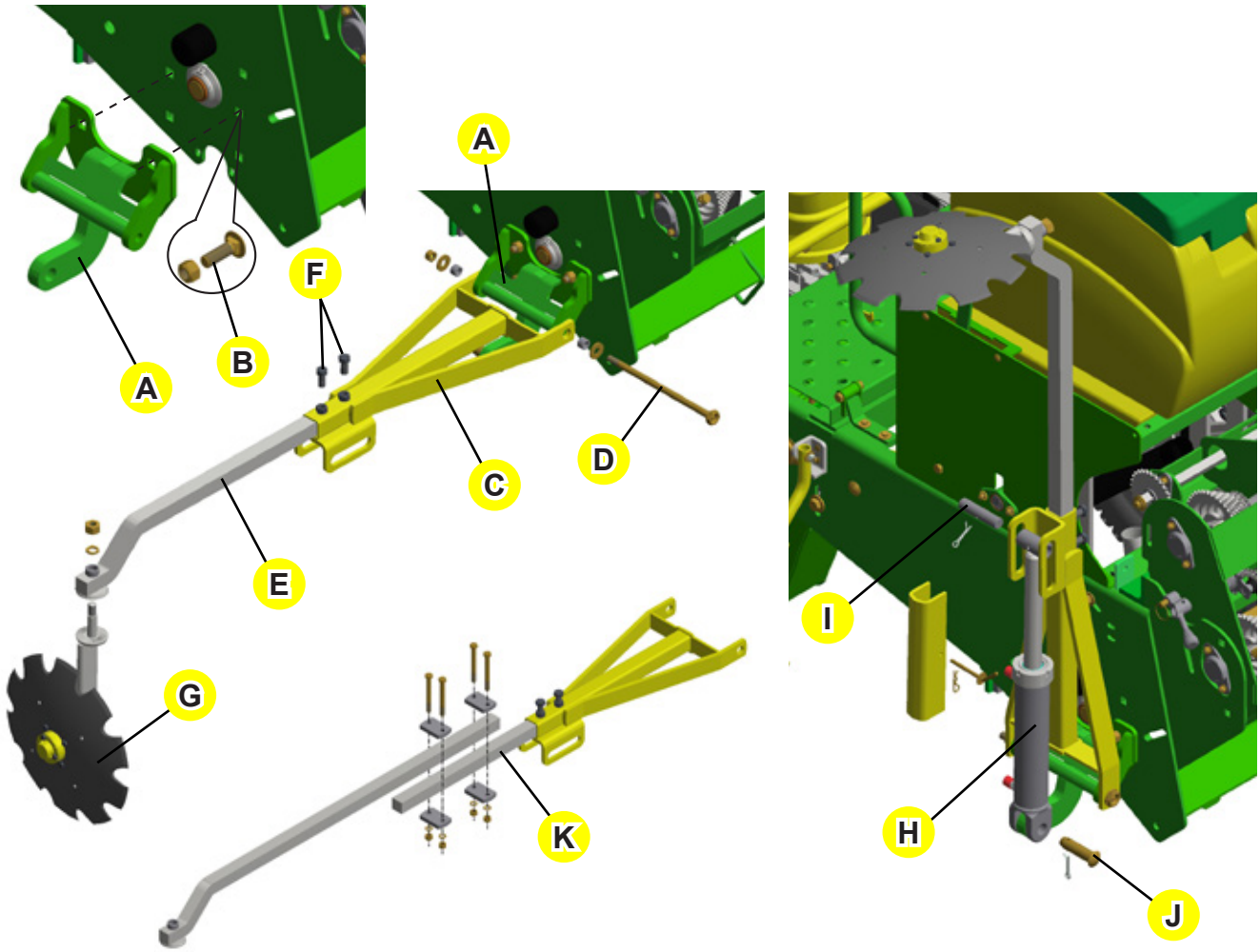
Couple the row marker arm (C) to the support (A) using bolts (D), spring washers, articulation brackets, spacing brackets and nuts.

Then, fasten the extensor (E) using bolts (F) and the row marker disc (G) using a spring washer and nut.

Lastly, fasten the hydraulic cylinder (H) to the row marker arm using the shaft (I) and a junction shaft (J) to the support.

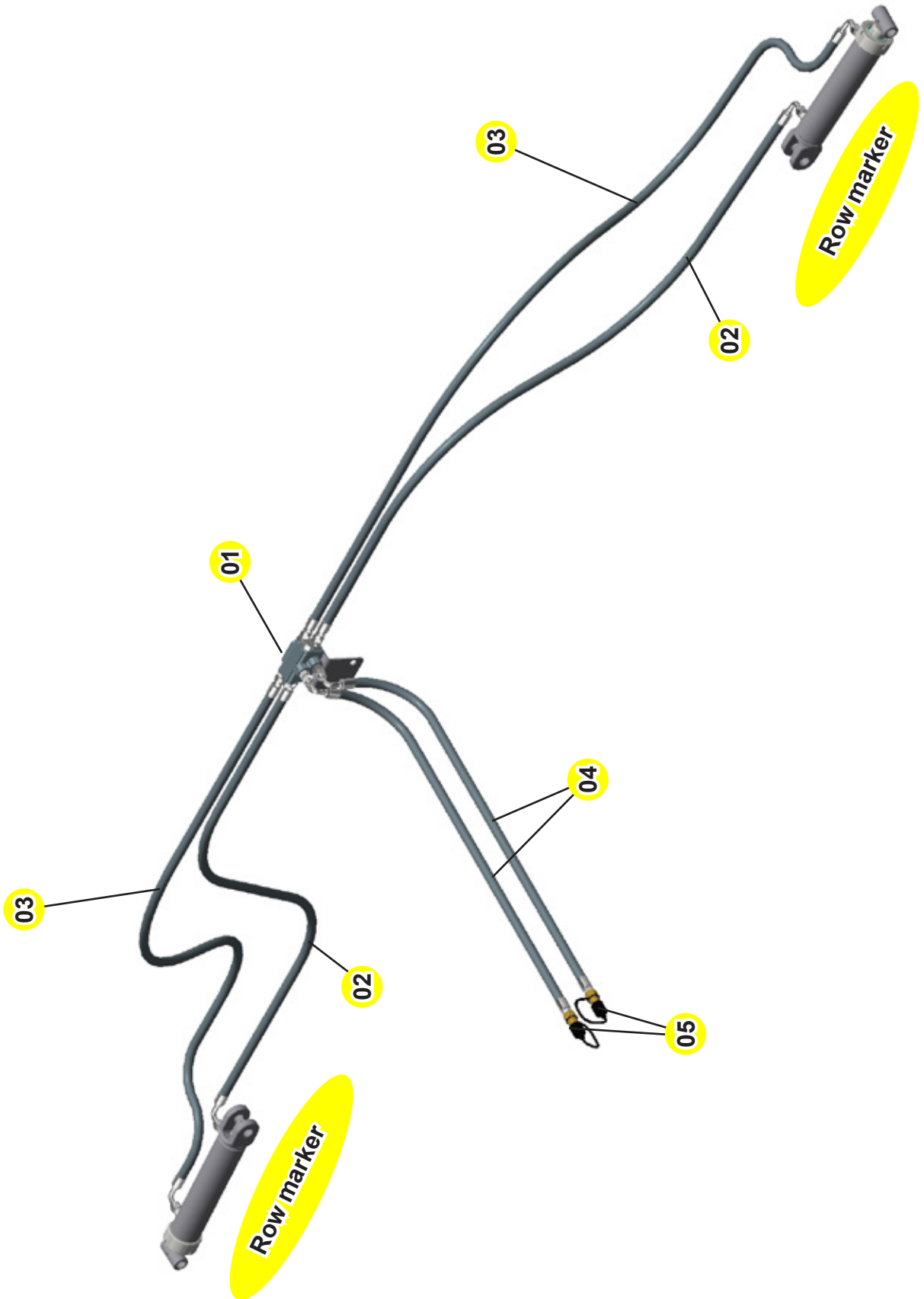
Use an extensor (K), bolt, lock and nut for planters with 11,13, 15 and 17 row units.

NOTE **The row markers feature an independent lift activation that can be activated without raising or lowering the planter.**



Have a special care to not let people or animals close to the marker discs operation area.

Hydraulic circuit for the hydraulic row marker



Hydraulic circuit for the hydraulic row marker tables

Item	Ultra flex 4045 (9 row units)	Qt
01	Sequence valve	01
02	3/8" x 3400 TR-TC hose	02
03	3/8" x 3600 TR-TC hose	02
04	3/8" x 4000 TC-TM hose	02
05	Male quick coupler 1/2 w/ lid	02

Item	Ultra flex 4495 (10 row units)	Qt
01	Sequence valve	01
02	3/8" x 3625 TR-TC hose	02
03	3/8" x 3825 TR-TC hose	02
04	3/8" x 4000 TC-TM hose	02
05	Male quick coupler 1/2 w/ lid	02

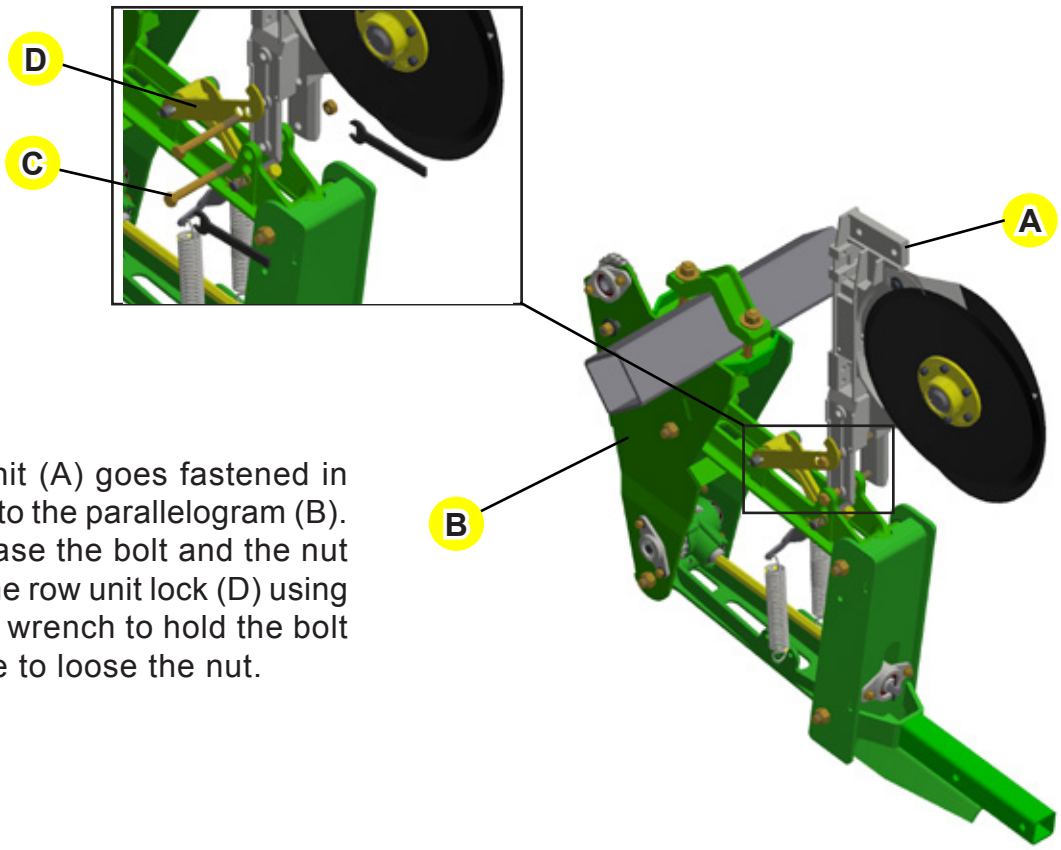
Item	Ultra flex 4895 (11 row units)	Qt
01	Sequence valve	01
02	3/8" x 3800 TR-TC hose	02
03	3/8" x 4000 TR-TC hose	02
04	3/8" x 4000 TC-TM hose	02
05	Male quick coupler 1/2 w/ lid	02

Item	Ultra flex 5745 (13 row units)	Qt
01	Sequence valve	01
02	3/8" x 4200 TR-TC hose	02
03	3/8" x 44005 TR-TC hose	02
04	3/8" x 4000 TC-TM hose	02
05	Male quick coupler 1/2 w/ lid	02

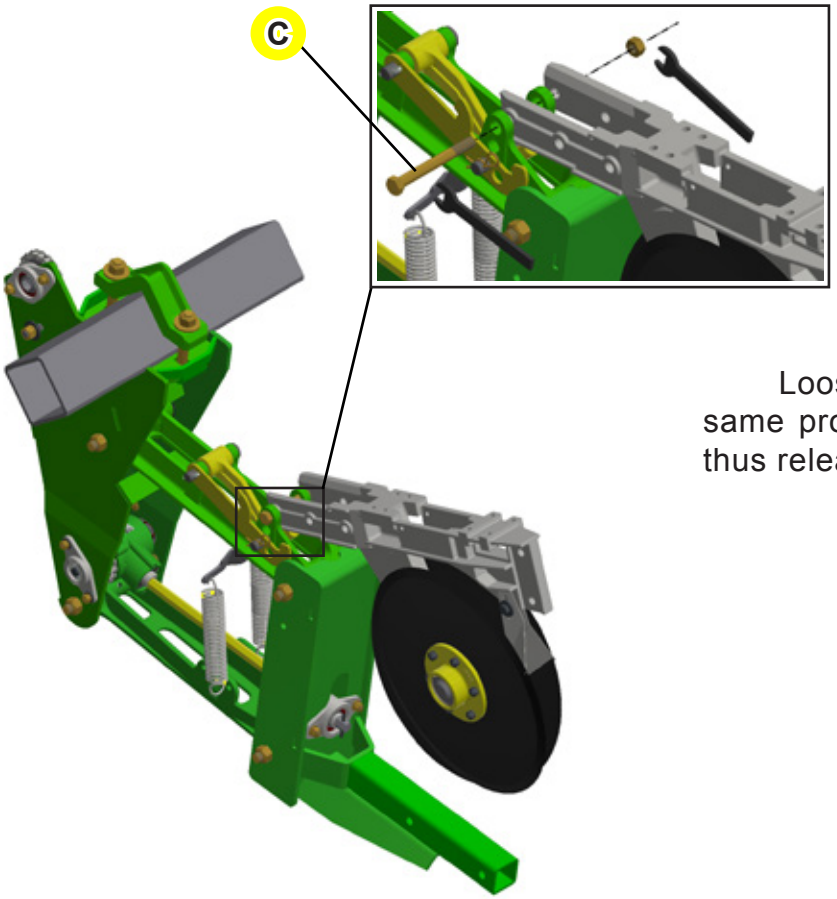
Item	Ultra flex 6645 (15 row units)	Qt
01	Sequence valve	01
02	3/8" x 4700 TR-TC hose	02
03	3/8" x 4900 TR-TC hose	02
04	3/8" x 4000 TC-TM hose	02
05	Male quick coupler 1/2 w/ lid	02

Item	Ultra flex 7545 (17 row units)	Qt
01	Sequence valve	01
02	3/8" x 5200 TR-TC hose	02
03	3/8" x 5200 TR-TC hose	02
04	3/8" x 4000 TC-TM hose	02
05	Male quick coupler 1/2 w/ lid	02

Assembly of the row unit (rear part)



The row unit (A) goes fastened in vertical position to the parallelogram (B). To lower it, release the bolt and the nut (C) that fasten the row unit lock (D) using a 3/4" open end wrench to hold the bolt and another one to loose the nut.



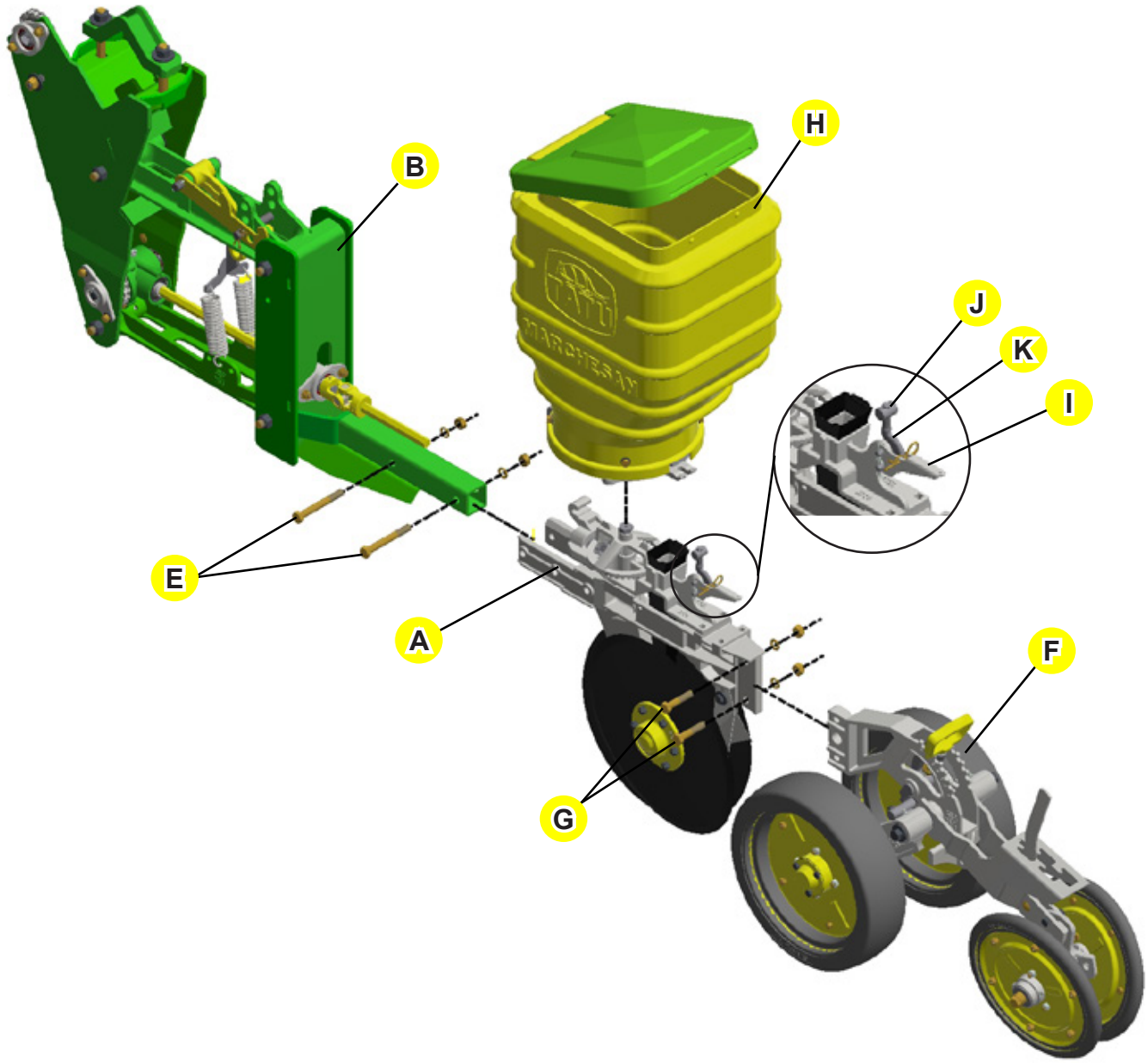
Loose the nut and bolt (C) using the same procedure with the wrenches and thus releasing the row unit.

Assembly

Fasten the row unit (A) to the parallelogram (B) using bolts (E), spring washers and nuts.

Then, fasten the rear part of the row unit (F) using bolts (G), spring washers and nuts.

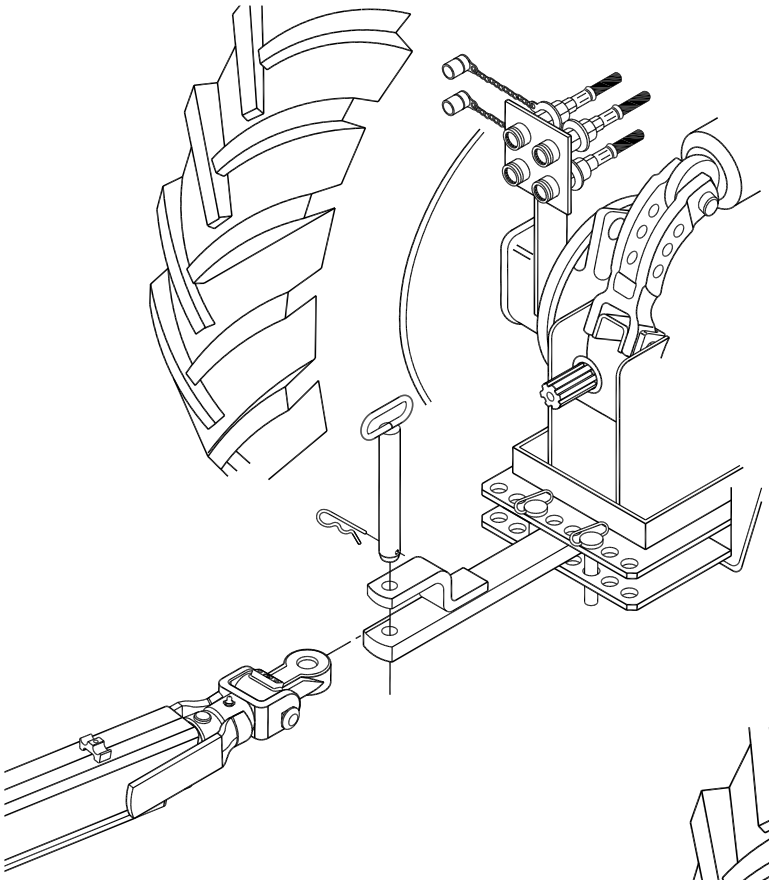
Lastly, lock the hopper (H) using a quick locking (I). To avoid damages to the quick locking and seed disc locking, never overtight the quick lock adjuster (J) and leave it facing the threaded stud of the quick lock (K). If the adjuster gets loose, fasten the thread until it tighten properly. Overtightening it may break the quick locking and the disc locking.



Tractor preparation

If necessary, use counterweights on the rear wheels or in the front part of the tractor.

Hitching to the tractor

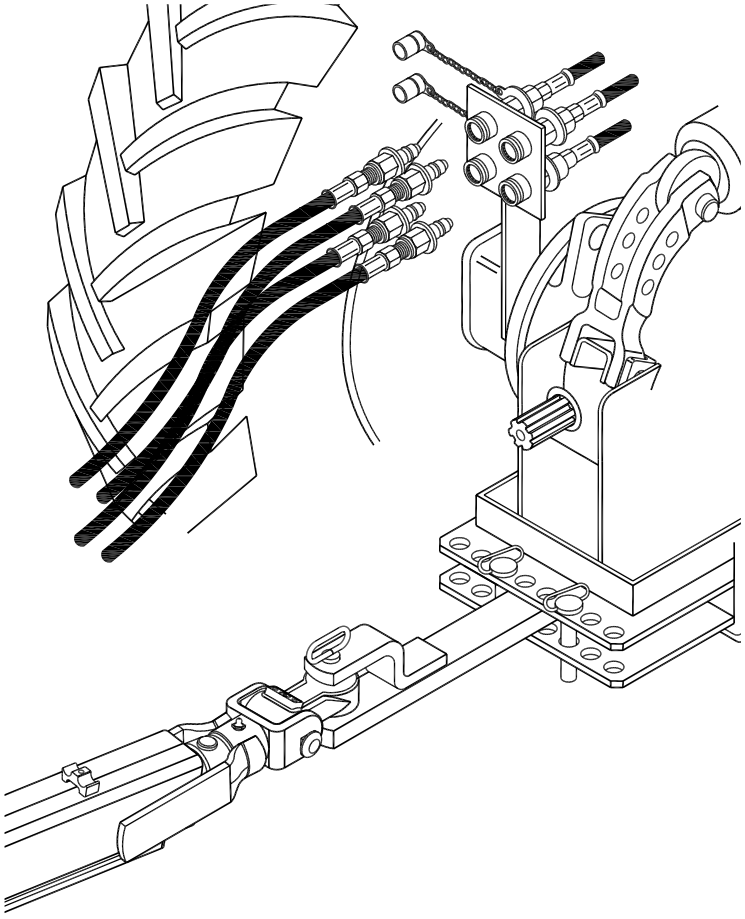


1) Hitch the drawbar to the tractor hitch bar, placing the pin and r-clip.

If necessary, use the drawbar extensor arm (third point) to facilitate the hitching.

Observe that the hitch bar must remain fixed during working.

2) Couple the hoses to the tractor quick couplers with double command. There are two hoses to raise or lower the planter and two to activate the row markers.

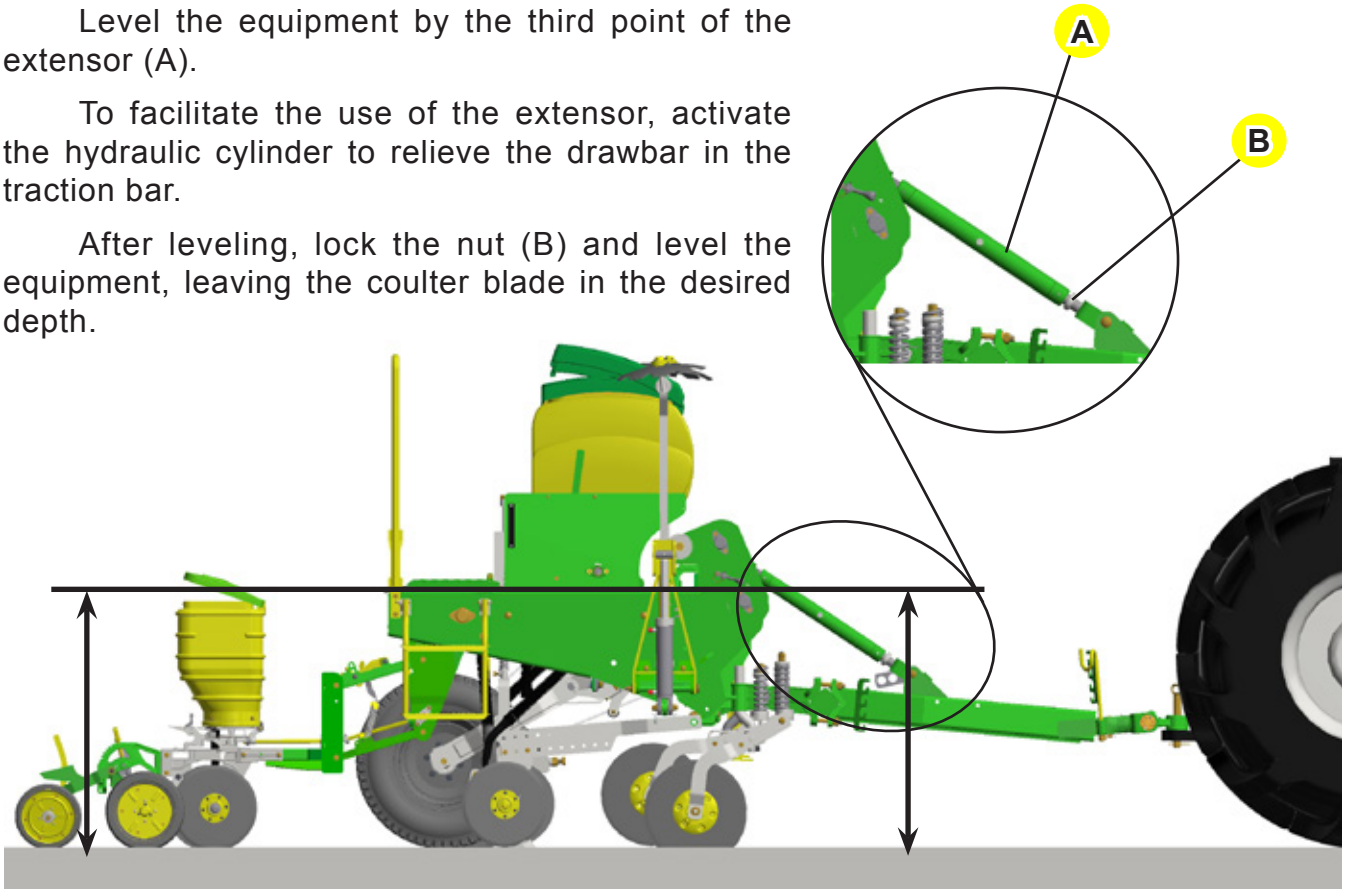


Planter leveling

Level the equipment by the third point of the extensor (A).

To facilitate the use of the extensor, activate the hydraulic cylinder to relieve the drawbar in the traction bar.

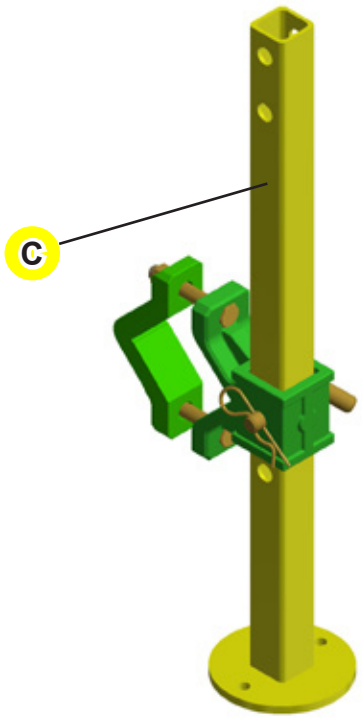
After leveling, lock the nut (B) and level the equipment, leaving the coulter blade in the desired depth.



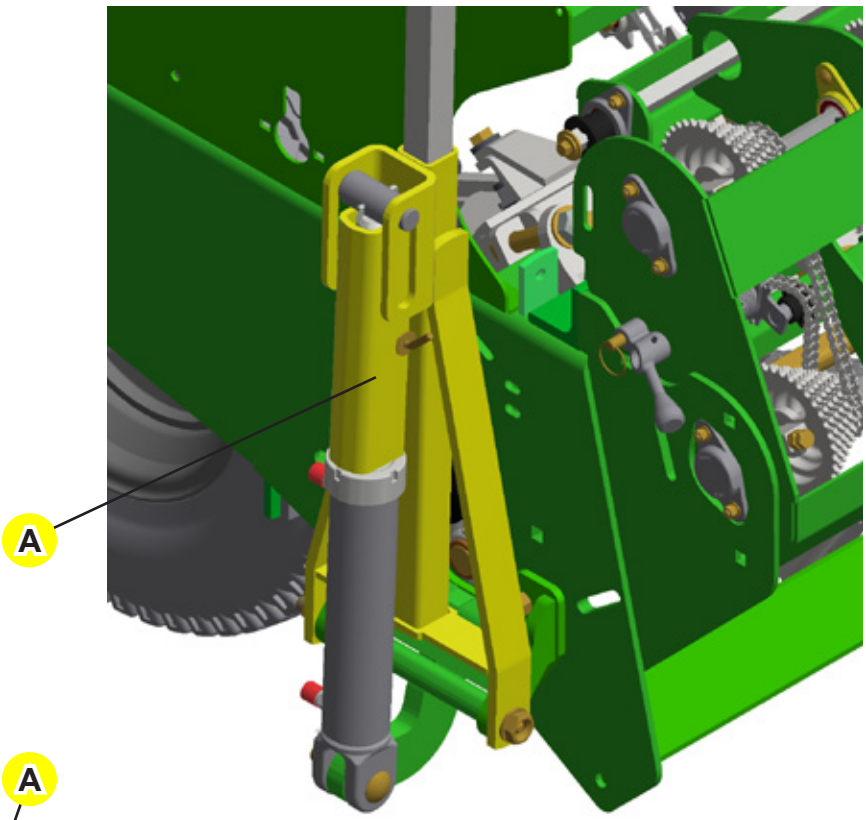
Setting the planter in transport position

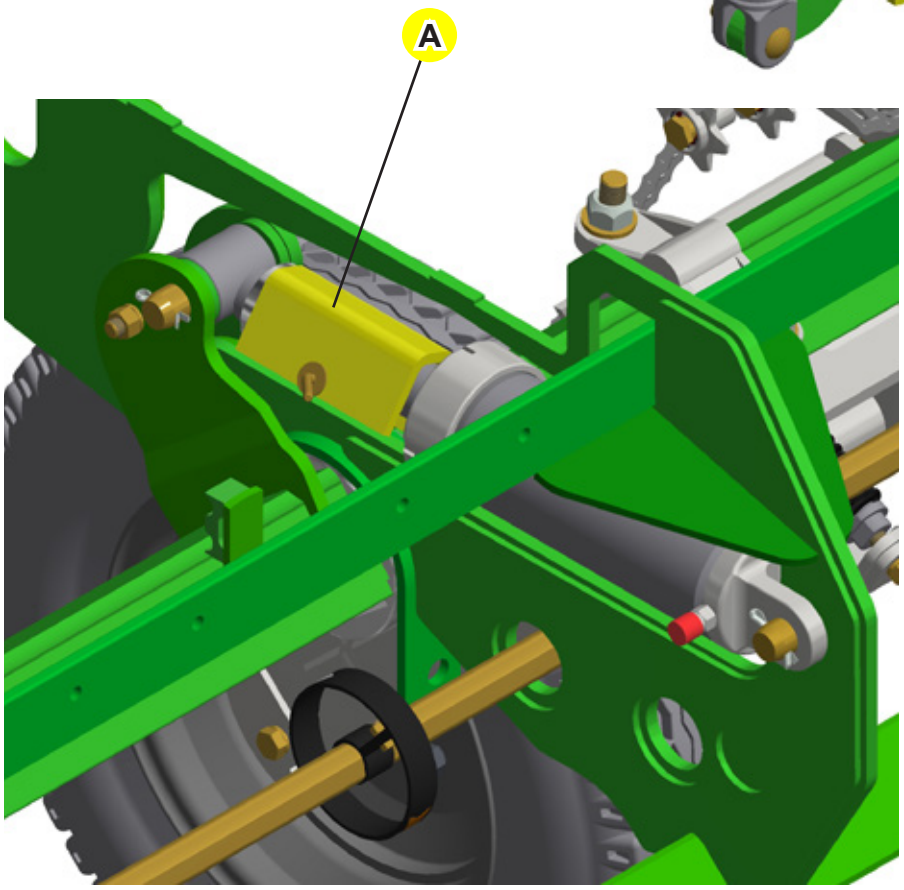
After hitching the planter, totally lift the row units by activating the hydraulic cylinder.

Lift the parking stands (C), according to the illustration.



During transporting and maintenance, always use the safety locks (A) on the hydraulic cylinders rods of the row markers and wheelsets.





IMPORTANT

Only fill the planter in the work place.

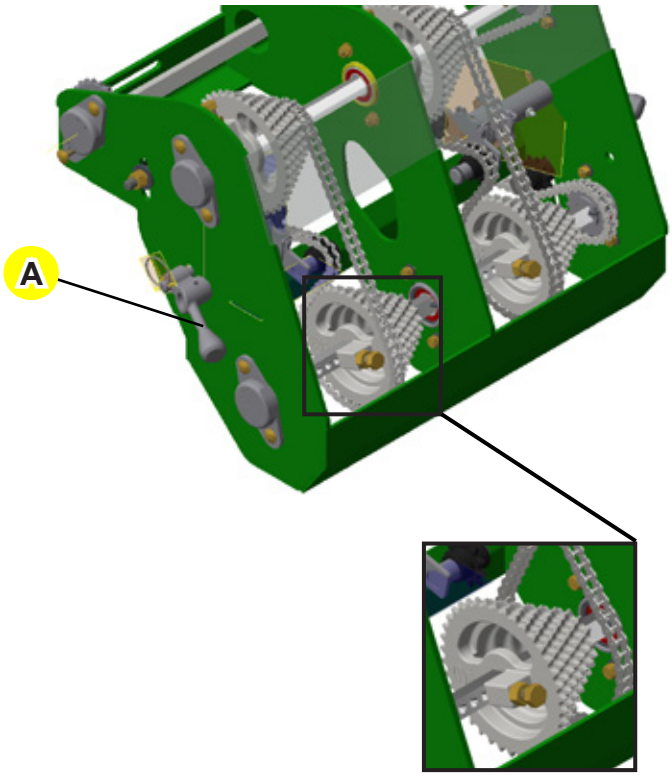
Never transport the planter with load excess.

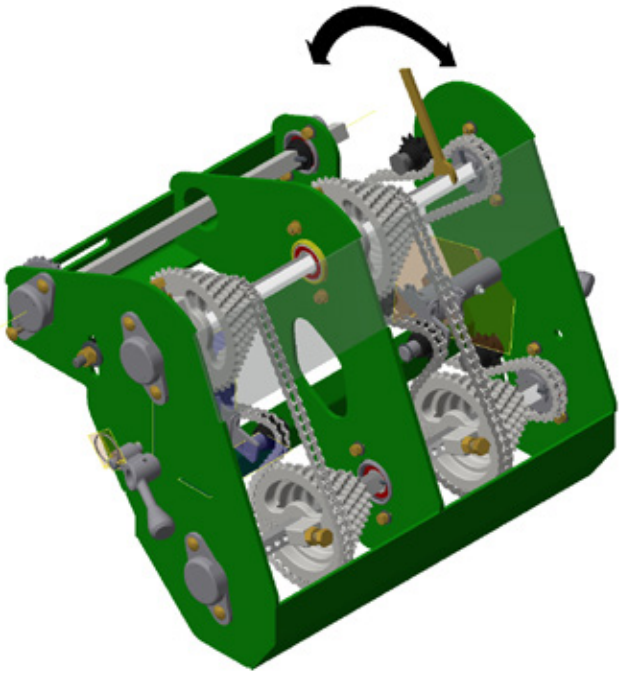
Procedures before operating the planter

The following instructions must be carefully observed in order to get the best working performance and to extend the planter lifetime. When putting the planter in operation for the first time during off season or after a long inactive period, follow the instructions below:

1) Move and lock the lever (A) to release the chain tightener.

2) Displace the chain from the sprockets.





3) Using a 19 mm wrench (3/4"), turn the driven shaft applying a small effort and check if the shaft will turn easily.

Place the chain in the sprockets again. Release the lever by loosening the chain tightener pin.

NOTE **Turn the driven shaft always to the clockwise direction.**

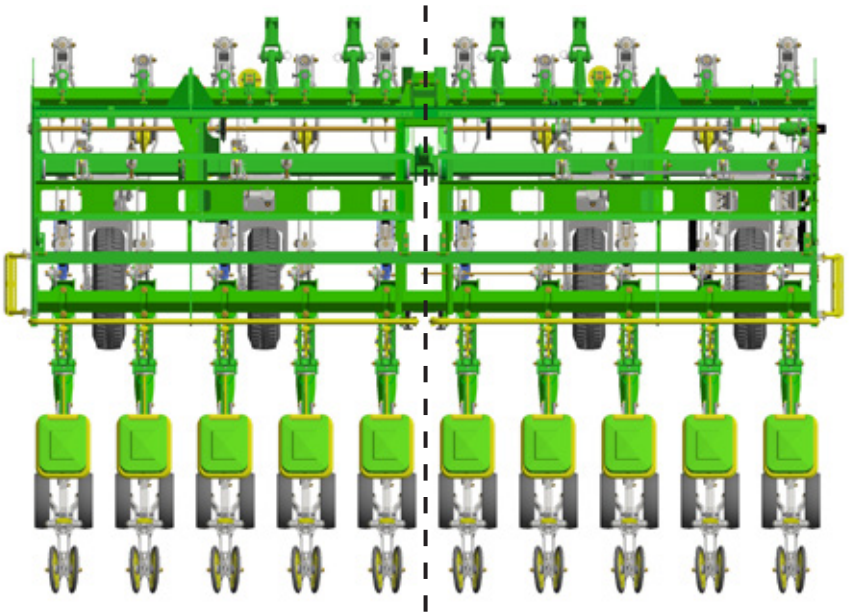
Spacing between row units

ULTRA FLEX leaves the factory with a minimal row spacing according to the requested number of row units, allowing a possibility of other spacings if the crop needs it.

Positioning the row units in the frame

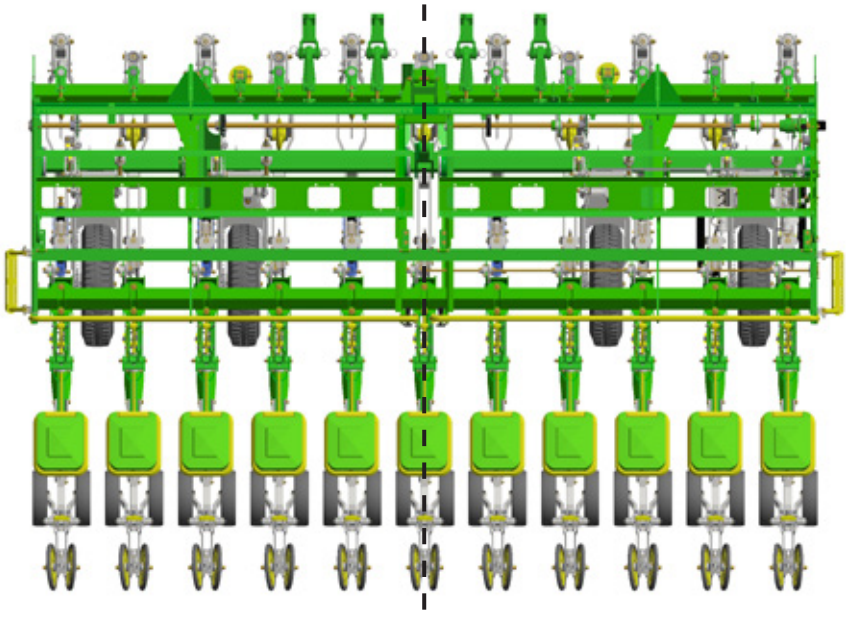
Even number of row units:

Set the frame center and measure half of a spacing to the right and half to the left, placing on these points the first two row units; from these rows, set the other ones with one spacing to each side.



Odd number of row units:

Place one row unit in the frame center and set the other ones with the desired spacing.



NOTE **Whether the planter have an even or odd number of row units, the first row unit on the left side will always be short.**

Spacing tables

Check all possible spacings on pages 34 and 35 and follow the assembly instructions on page 33.

Frame	Number of row units	Spacings
4045	4	950
	5	750 - 800 - 850 or 900
	6	550, 600, 650, 700 or 750
	7	550 or 600
	8	500
	9	450

Frame	Number of row units	Spacings
4495	5	850 - 900
	6	700 - 750 or 800
	7	600 - 650
	8	550
	9	500
	10	450

Frame	Number of row units	Spacings
4845	5	950
	6	800 - 850 or 900
	7	650 or 700
	8	600
	9	550
	10	500
	11	450

Spacing tables

Frame	Number of row units	Spacings
5745	5	950
	7	800 - 850 or 900
	8	700 or 750
	9	650
	10	550 or 600
	11	500
	12	500
	13	450

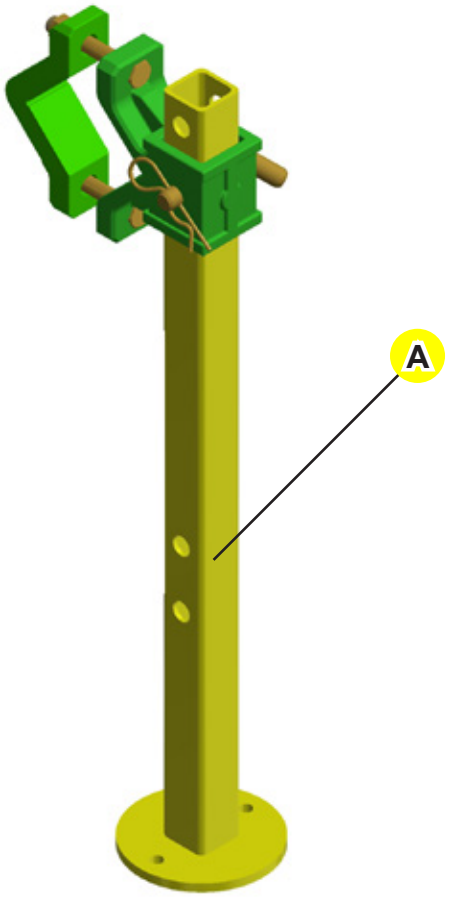
Frame	Number of row units	Spacings
6645	8	750 - 800 - 850 or 900
	9	800
	10	650 or 700
	12	550
	13	500
	15	450

Frame	Number of row units	Spacings
7545	10	750 or 800
	12	650
	14	500 - 550
	15	500
	17	450

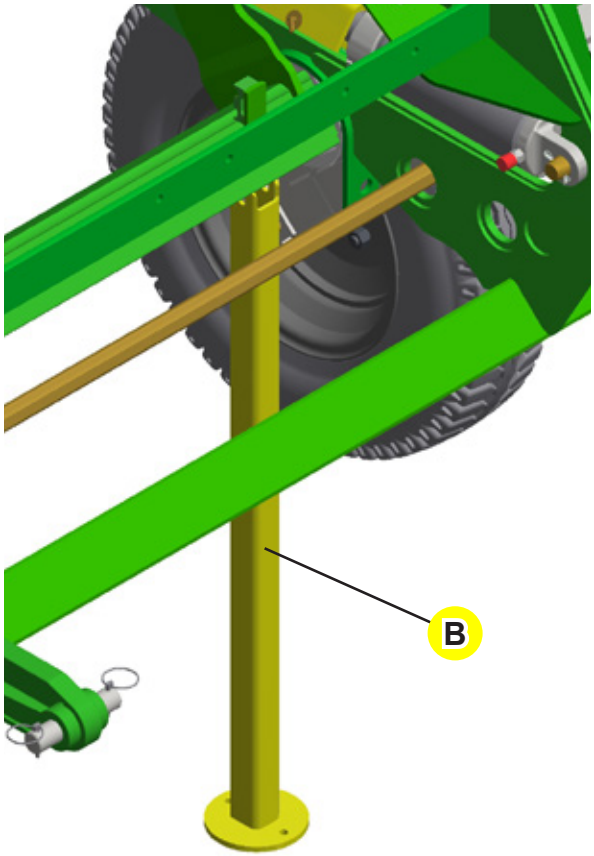
Procedures to change the spacing

To change the spacing choose a flat, firm and clean place.

Before lowering the parking stands (A) it is necessary to position them between the row units that already have the desired spacing.



Place the supports (B) in the rear angle brackets ends. Activate the hydraulic cylinder to lower the equipment.



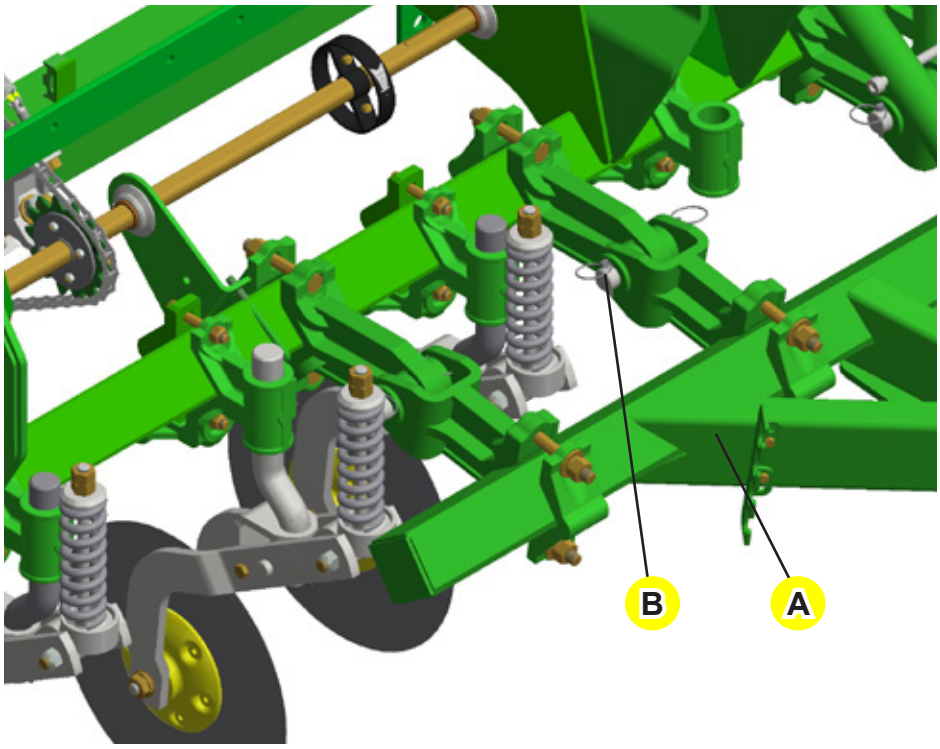
Check if the planter is properly supported to avoid accidents.

The following instructions are necessary when placing or removing any row unit in the equipment.

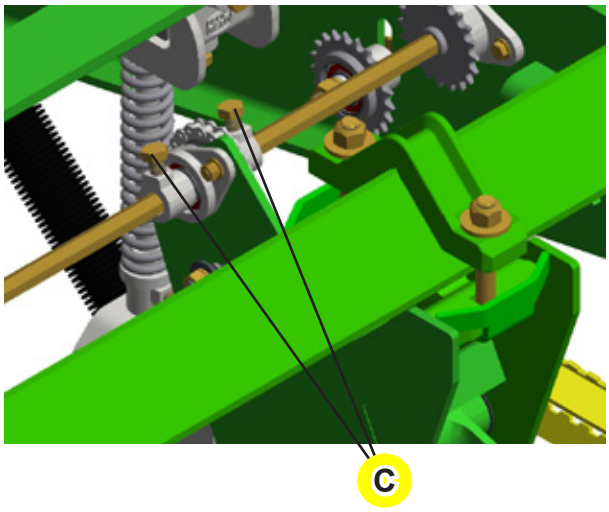
Procedures to change the spacing

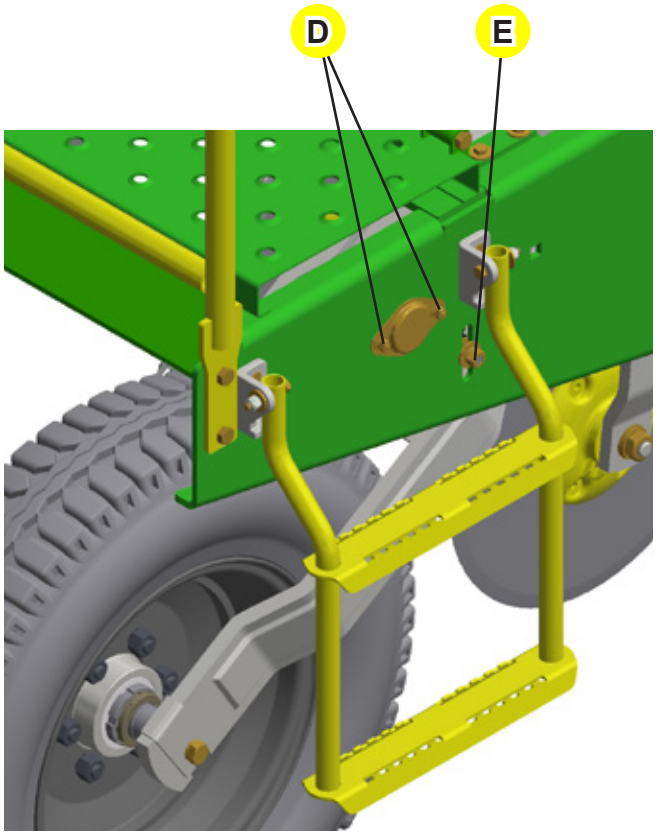
Relieve the control valve pressure and follow the instructions below:

1) Remove the drawbar (A) by removing the pins (B) and loosening the bolts, nuts, springs, wheelsets, clutches, levers, coulter blades and fertilizer rows, so it is possible to displace these components in the frame.



2) Loosen the bolts (C) from the brackets that locks the hexagonal shaft.



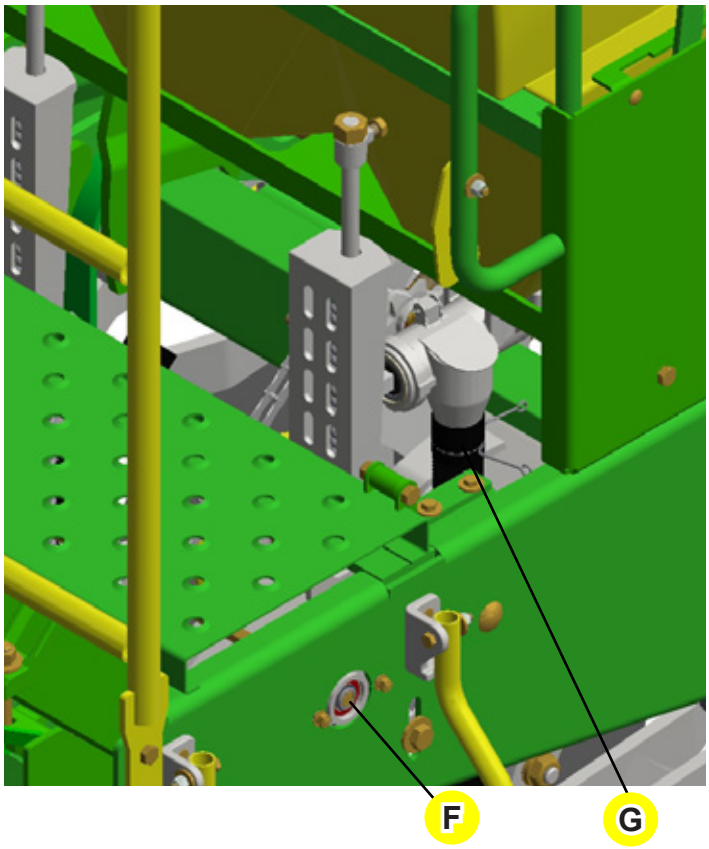


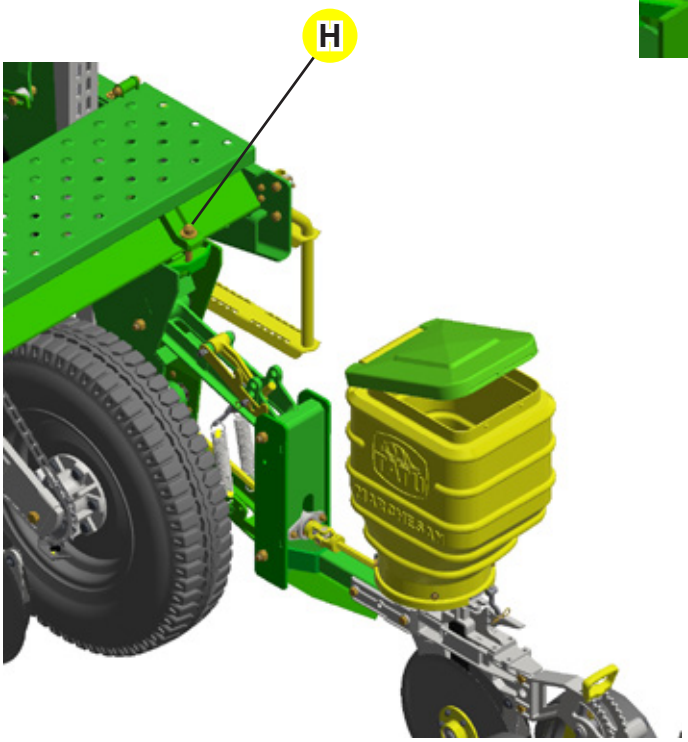
3) Loosen the bolts (D) that fasten the support bearing of the hexagonal shaft and release the chain tightener (E), if necessary.

Procedures to change the spacing

4) Totally removes the hexagonal shaft (F).

5) Release the fertilizer hoses (G).





6) Release the nuts (H) to facilitate the parallelogram movement. Adjust as desired and retighten the nuts.

7) Remove or move away the row units in the lateral of the tires, allowing a greater working range.

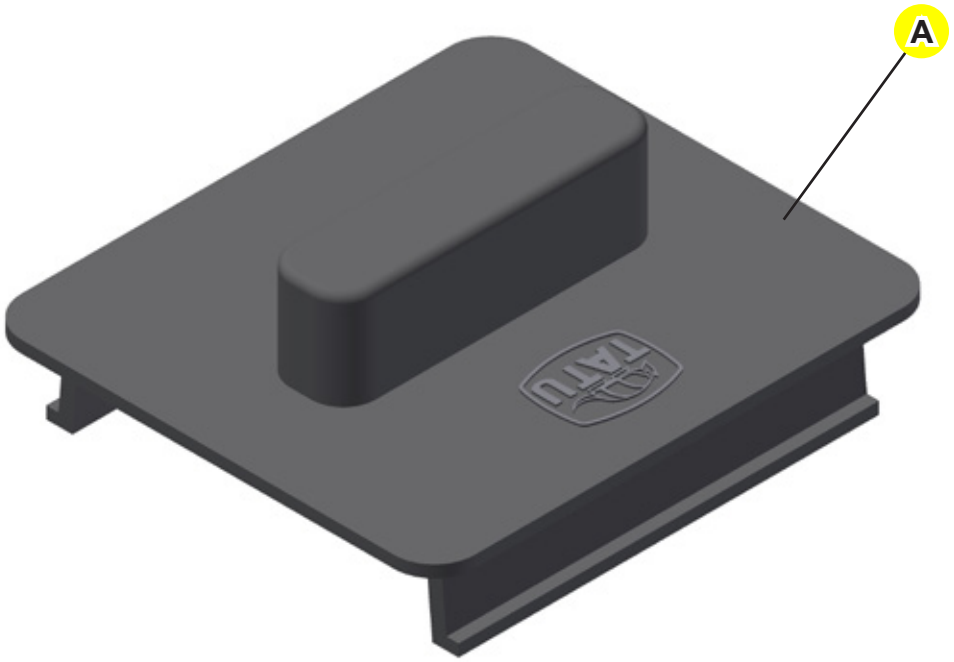
Displace all sets to the desired position, according to the chosen spacing. Assemble the hexagonal shaft and check if it is easy to turn. Fasten the bearings, tighteners and place the drawbar according to the instructions on pages 18, 19 and 20, keeping the spacing as big as possible always.

IMPORTANT

Retighten all sets, paying attention to the following points:

- **Retighten the nuts that fasten the seed rows on the frame gradually, avoiding to totally tighten each nut at a time.**
- **That information is also useful between a row unit and another. So, do not totally tighten a row unit at a time, but gradually.**
- **When switching between this nut tightening operation of a row unit and passing to another, it is necessary to spin the hexagonal shaft to keep the proper alignment and avoid locking.**
- **The bolts that have brackets and fasten the hexagonal shaft should be tightened in the end.**
- **Check the chain correct alignment (clutches / wheelsets).**

• To close the fertilizer outlet, place the chutes (A) over the augers that will not be used.



To work with some seed rows lifted, it is necessary to:

• Remove all the rear part of the row units;

• Remove the traction spring;

• Release the frontal part of the upper rocker arm;

• Lift the row unit and lock using the upper rocker arm;

• Remove the rod/double disc from the fertilizer row.

Planning the plantation - Correct seed rate

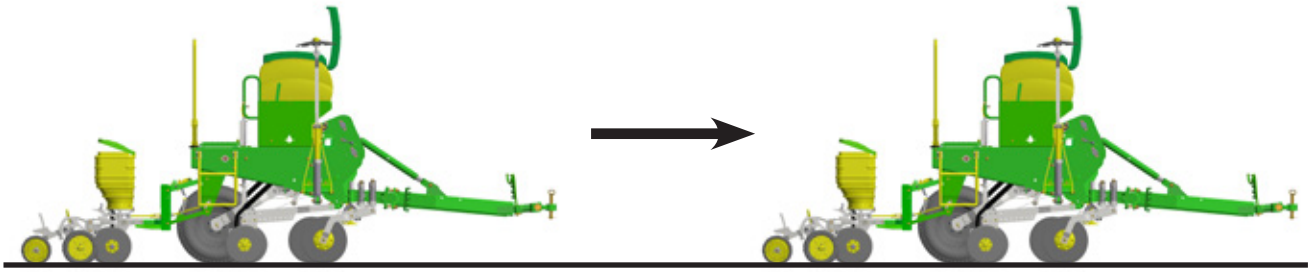
Consider that the amount of plants in the harvest is always smaller than the number of seeds distributed in the planting operation, due to the following factors: germination rate, physical purity, vigor (provided in the seed pack), plagues and diseases that may take place during the cultivation cycle.

Also, consider that during the plantation slippage or skidding of the planter tires can occur, according to the local working conditions.

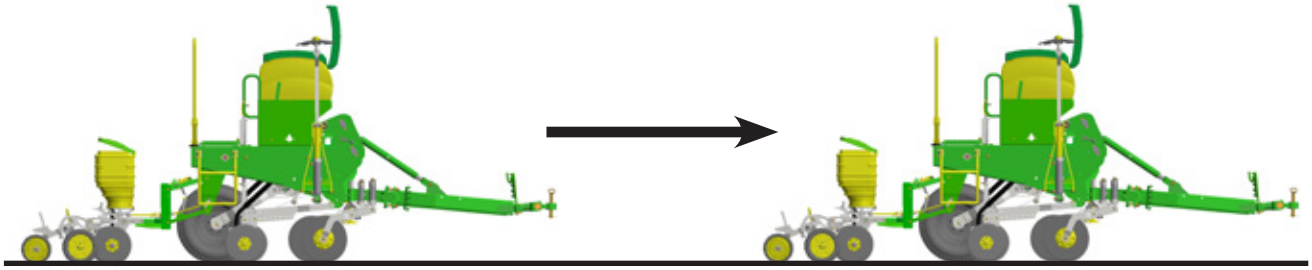
How to calculate the slippage index of the planter**:**

This index is obtained by comparing the number of spins the tire will perform, being the planter with empty hoppers and then filling it up, moving the planter around to see the difference.

Being the planter empty and normally hitched to the tractor, set a starting point on the ground and on the tire. Move the planter until the tire complete 10 (ten) spins. Measure and write down the traveled distance.



Fill up the planter hopper, repeat the previous procedure and write down the traveled distance.



Calculation:

$$\frac{\text{Filled distance} - \text{Empty distance} \times 100}{\text{Empty distance}}$$

NOTE **The tires must have the same design, same inflation and same adjustment of springs over the wheelset arms.**

Working preparation

To obtain an amount of 50,000 plants per hectare in the cultivation, whose seeds contain:

Germination index = 95%

Physical purity = 90 and

Slippage index = 1.03 (3%)

The following calculation should be made to know how many seeds should be distributed in a hectare.

Seeds/ha in the plantation = 0.95 x 0.90 = 0.855

$\frac{50,000}{0.855}$ = 58,479.53 x 1.03 = **60,233.91**

To know the amount of seeds per meter, per 10 meters and so on, calculate how many linear meters of rows exist in a hectare, in the desired spacing.

Example: $\frac{10,000}{0.85\ m}$ = 11,764.70 linear meters, so: $\frac{60,233.91}{11,764.7}$ = **5.1198**

Approximately **5.12** seeds per meter.

Procedures before the plantation

• Before starting the plantation, make a general inspection on the equipment. Retighten all bolts and nuts and check the condition of all pins and cotter pins, avoiding future damages. Repeat this operation after the first day of work.

• Check the correct inflation on both tires of the planter **(75 PSI)**.

• Also check if there is no strange object inside the hoppers, which may damage metering the mechanisms.

• Lubricate all grease fittings appropriately.

NOTE

• Only fill up the planter on the work station.

• Do not transit with load excess over the planter.

Ideal working speed

The Ultra Flex and Ultra Flex Suprema planters work with higher efficiency at speeds from 5 to 7 Km/h.

NOTE

When planting corn, operate at speeds from 5 to 5.5 km/h.

It is necessary to keep a constant speed during all plantation.

Graphite powder use

The graphite powder should be combined to the seeds to facilitate the distribution and to increase the lifetime of the metering device.

Amount of graphite per kilogram of seed			
Planters with distribution system:	Seeds treated with insecticide		
	Small and round	Big and round	Flattened
Horizontal seed plates	04 grams	02 grams	04 grams

- The graphite should not be combined before the seed treatment.
- The graphite should not be combined to the insecticide to apply in the seeds.
- For non-treated seeds, use only half of the graphite mentioned in the previous table.

NOTE **The seed distributor features buttons, rocker arm and pulley. They must be cleaned internally at least once a day for the plantation of non-treated seeds and twice a day for the plantation of treated seeds.**

List of standard seed plates in the planter

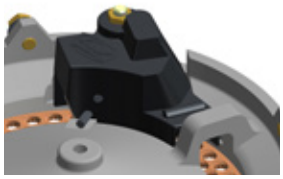
Description	Serial number
8 mm soybean seed plate (orange)	05.03.01.6217
9 mm soybean seed plate (pink)	05.03.01.6218
12 mm corn seed plate (orange)	05.03.01.6204

Optional seed plates list on page 61.

ATTENTION **The amount of seed plates that are included with the planter corresponds to the number of row units.**

NOTE

- **The available height for the placement of the plate plus the false ring is 8,5 mm, however:**
- **If a plate that has 4,5 mm of thickness is used, the false ring must have 4,0 mm.**
- **To use a plate that has 5,5 mm of thickness, place a false ring of 3,0 mm.**
- **Do not put a false ring if a plate that has 8,5 mm of thickness is used.**

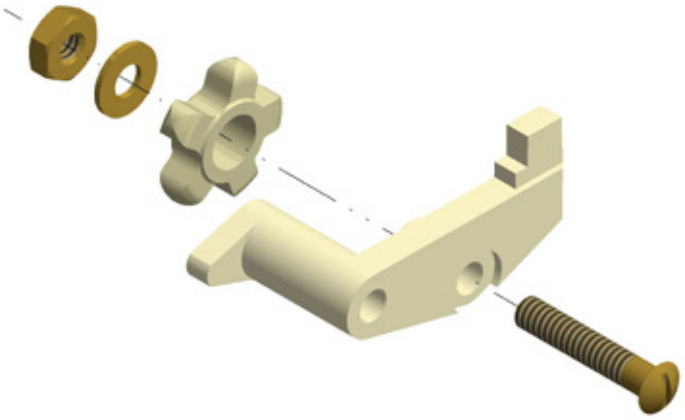


Working preparation

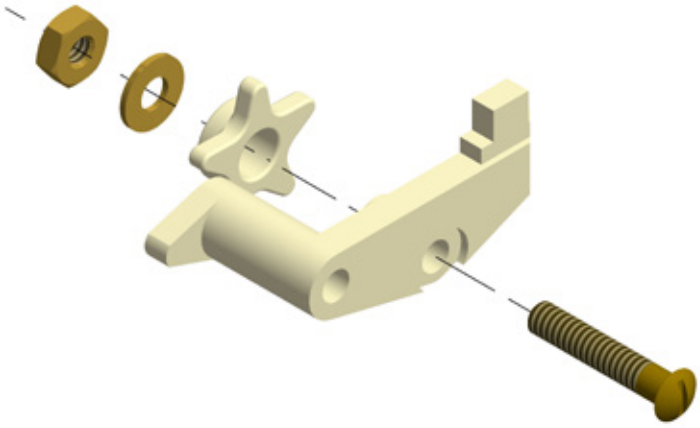
• Special attention should be given to the rocker arm and seed sprocket, as well as the good operation of all seed meterings.

• The rocker arm and the pulley of 5 teeth goes assembled with the equipment and can be used in all plates with one row of slots or holes, i.e.: corn in round shape, soybean, delinted cotton, bean and others.

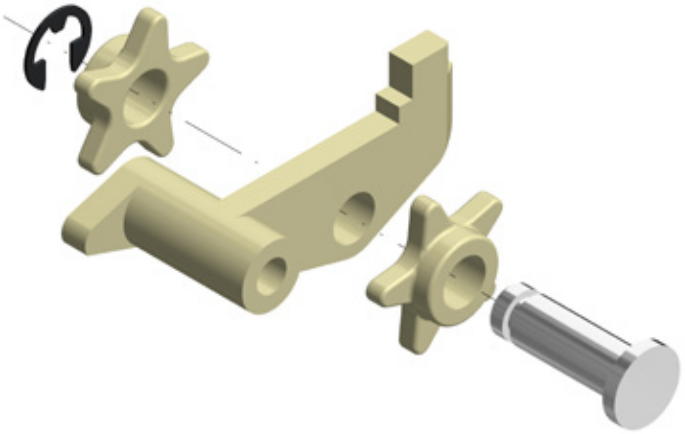
• For the plate for corn with oblong holes use the pulley with 4 teeth, which is not included with the equipment.



• For planting sorghum, it is necessary to use special pulleys, so that they enter in the holes and execute their function.



• For the soybean plate that features a double row of holes, it is necessary to use the double rocker arm (with two pulleys).



Seeds distribution

The amount and size of the holes/slots and the thickness of the seed plates can vary according to the grain size and the desired plant amount.

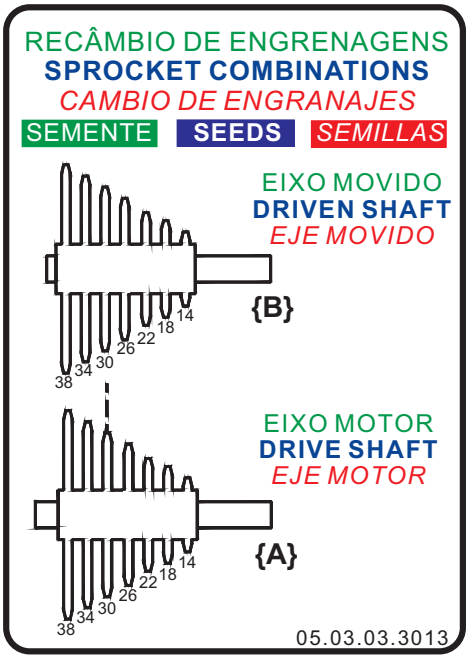
Adjust the seed rate per linear meter through the sprocket combinations of the Drive Shaft **{A}** (14, 18, 22, 26, 30, 34 and 38 teeth) and Driven Shaft **{B}** (14,18, 22, 26, 30, 34 and 38 teeth).

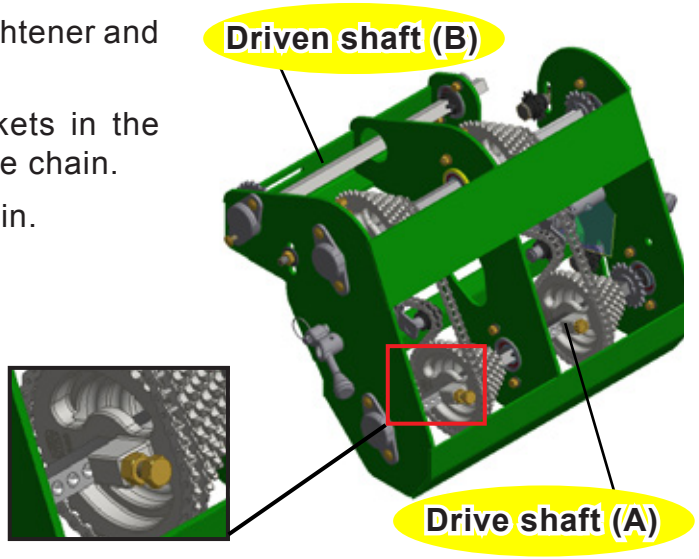
Procedures to change the sprocket

• Move the lever to relieve the chain tightener and lock it using a pin.

• Manually displace the set of sprockets in the shaft and align the chosen sprocket with the chain.

• Release the lever to loose the lock pin.





NOTE

The cone bolts on the sprockets handling "TRA" are pre-adjusted on the factory, allowing to change the sprockets without using any tool. In case of any sliding motion on the cone shaft, just release the counter nut and turn around the bolt to re-lock.

In order to avoid damage to the spring and shafts, never apply excessive torque when tightening.

IMPORTANT

The following pages show the different amounts of seeds distributed to many crops, according to the sprocket combinations.

The correct seed plate matching to the used seeds is very important.

Never combine seeds of different sizes.

The seed and fertilizer distribution tables in this manual must be used as a reference to start the planter adjustment. Factors such as the slippage index of the planter wheels (skidding), working speed, tire inflation, field conditions, seed type and others can make the values differ from the ones in the table. Therefore, it is always indispensable to make the practical distribution tests, as indicated on page 50.

Seed distribution table - 05.03.03.2997

TABELA DE DISTRIBUIÇÃO DE SEMENTES
TABLE FOR DISTRIBUTION OF SEEDS
TABLA DE DISTRIBUCIÓN DE SEMILLAS

Número de Furos / Rasgos **Number of Holes / Slots** *Número de Agujeros*		24	28	34	34	34	38	38	40	40	40	64	90	100
Qtde. Sementes por Furos/Rasgo **Quantity of Seeds per Hole/Slot** *Cantidad de semillas por Agujero*		1	1	1	2	5	2	3	1	2	3	1	1	1
Engrenagens/**Sprockets**/*Engranajes*		Sementes em 1 Metro* / **Seeds in 1 Meter*** / *Semillas en 1 Metro**												
Eixo Motor **Drive Shaft** *Eje Motor*	Eixo Movido **Driven Shaft** *Eje Movido*													
14	**38**	1,20	1,40	1,70	3,40	8,49	3,80	5,70	2,00	4,00	6,00	3,20	4,50	5,00
14	**34**	1,34	1,56	1,90	3,80	9,49	4,24	6,37	2,23	4,47	6,70	3,57	5,03	5,58
14	**30**	1,52	1,77	2,15	4,30	10,76	4,81	7,21	2,53	5,06	7,59	4,05	5,70	6,33
18	**38**	1,54	1,80	2,18	4,37	10,92	4,88	7,32	2,57	5,14	7,71	4,11	5,78	6,42
18	**34**	1,72	2,01	2,44	4,88	12,20	5,46	8,18	2,87	5,74	8,61	4,59	6,46	7,18
14	**26**	1,75	2,04	2,48	4,97	12,41	5,55	8,32	2,92	5,84	8,76	4,67	6,57	7,30
22	**38**	1,88	2,20	2,67	5,34	13,35	5,97	8,95	3,14	6,28	9,42	5,02	7,07	7,85
18	**30**	1,95	2,28	2,77	5,53	13,83	6,18	9,28	3,25	6,51	9,76	5,21	7,32	8,14
14	**22**	2,07	2,42	2,93	5,87	14,67	6,56	9,84	3,45	6,90	10,36	5,52	7,77	8,63
22	**34**	2,11	2,46	2,98	5,97	14,92	6,67	10,00	3,51	7,02	10,53	5,62	7,90	8,77
26	**38**	2,23	2,60	3,15	6,31	15,77	7,05	10,58	3,71	7,42	11,13	5,94	8,35	9,28
18	**26**	2,25	2,63	3,19	6,38	15,96	7,13	10,70	3,76	7,51	11,27	6,01	8,45	9,39
22	**30**	2,39	2,78	3,38	6,76	16,91	7,56	11,34	3,98	7,96	11,93	6,36	8,95	9,94
26	**34**	2,49	2,90	3,53	7,05	17,63	7,88	11,82	4,15	8,30	12,44	6,64	9,33	10,37
14	**18**	2,53	2,95	3,59	7,17	17,93	8,02	12,02	4,22	8,44	12,66	6,75	9,49	10,55
30	**38**	2,57	3,00	3,64	7,28	18,20	8,14	12,20	4,28	8,56	12,85	6,85	9,63	10,71
18	**22**	2,66	3,11	3,77	7,54	18,86	8,43	12,65	4,44	8,88	13,31	7,10	9,99	11,09
22	**26**	2,75	3,21	3,90	7,80	19,51	8,72	13,08	4,59	9,18	13,77	7,34	10,33	11,47
26	**30**	2,82	3,29	4,00	7,99	19,98	8,93	13,40	4,70	9,40	14,10	7,52	10,58	11,75
30	**34**	2,87	3,35	4,07	8,14	20,34	9,09	13,64	4,79	9,57	14,36	7,66	10,77	11,96
34	**38**	2,91	3,40	4,13	8,25	20,63	9,22	13,83	4,85	9,71	14,56	7,77	10,92	12,13
22	**22**	3,25	3,80	4,61	9,22	23,05	10,31	15,46	5,42	10,85	16,27	8,68	12,20	13,56
38	**34**	3,64	4,24	5,15	10,31	25,76	11,52	17,28	6,06	12,12	18,19	9,70	13,64	15,16
34	**30**	3,69	4,30	5,23	10,45	26,13	11,68	17,52	6,15	12,29	18,44	9,84	13,83	15,37
30	**26**	3,76	4,38	5,32	10,64	26,60	11,89	17,84	6,26	12,52	18,78	10,01	14,08	15,65
26	**22**	3,85	4,49	5,45	10,90	27,24	12,18	18,27	6,41	12,82	19,23	10,26	14,42	16,03
22	**18**	3,98	4,64	5,64	11,27	28,18	12,60	18,89	6,63	13,26	19,89	10,61	14,92	16,57
38	**30**	4,12	4,81	5,84	11,68	29,20	13,05	19,58	6,87	13,74	20,61	10,99	15,46	17,18
18	**14**	4,18	4,88	5,93	11,86	29,64	13,25	19,88	6,97	13,95	20,92	11,16	15,69	17,43
34	**26**	4,26	4,97	6,03	12,06	30,15	13,48	20,22	7,09	14,19	21,28	11,35	15,96	17,73
30	**22**	4,44	5,18	6,29	12,57	31,44	14,05	21,08	7,40	14,79	22,19	11,83	16,64	18,49
26	**18**	4,70	5,48	6,66	13,32	33,30	14,89	22,33	7,83	15,67	23,50	12,54	17,63	19,59
38	**26**	4,76	5,55	6,74	13,48	33,69	15,06	22,59	7,93	15,86	23,78	12,68	17,84	19,82
34	**22**	5,03	5,87	7,13	14,25	35,63	15,93	23,89	8,38	16,77	25,15	13,41	18,86	20,96
22	**14**	5,11	5,97	7,25	14,49	36,23	16,19	24,29	8,52	17,05	25,57	13,64	19,18	21,31
30	**18**	5,42	6,33	7,68	15,37	38,42	17,18	25,76	9,04	18,08	27,12	14,46	20,34	22,60
38	**22**	5,62	6,56	7,96	15,93	39,82	17,80	26,70	9,37	18,74	28,11	14,99	21,08	23,42
26	**14**	6,04	7,05	8,56	17,12	42,81	19,14	28,71	10,07	20,15	30,22	16,12	22,67	25,18
34	**18**	6,15	7,17	8,71	17,42	43,54	19,47	29,20	10,25	20,49	30,74	16,39	23,05	25,61
38	**18**	6,87	8,02	9,73	19,47	48,67	21,76	32,64	11,45	22,90	34,35	18,32	25,76	28,63
30	**14**	6,97	8,14	9,88	19,76	49,40	22,08	33,13	11,62	23,25	34,87	18,60	26,15	29,06
34	**14**	7,90	9,22	11,20	22,39	55,98	25,03	37,54	13,17	26,35	39,52	21,08	29,64	32,93
38	**14**	8,83	10,31	12,51	25,03	62,57	27,97	41,96	14,72	29,45	44,17	23,56	33,13	36,81

* Metro Linear / **Linear Meter** / *Metro Lineal*

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Calculation of seeds/meter according to the different number of holes in the seed plates

When using a seed plate that has a number of holes that is not included in the table, it is possible to find the amount of seeds/meter it will distribute by doing the calculation below:

In the table from the previous page, for a seed plate that has 24 holes (26 x 38 combination), the **amount of seeds per meter** equals 2.23.

Example:

Using the same transmission combination **(26 x 38)** but now using a seed plate with **20 holes**, use the calculation below.

Formula:

Multiply the amount of seed per meter (table = **2.23**) by the amount of holes (holes in the new plate = **20**) and divide by the amount of holes (seed plate on the table = **24**).

Calculation:

$$\frac{2.23 \times 20}{24} = \frac{44.6}{24} = 1.86 \text{ seeds per meter.}$$

Answer:

Using a seed plate with 20 holes, 1.86 seeds per linear meter will be distributed (26 x 38 combination).

Fertilizer distribution

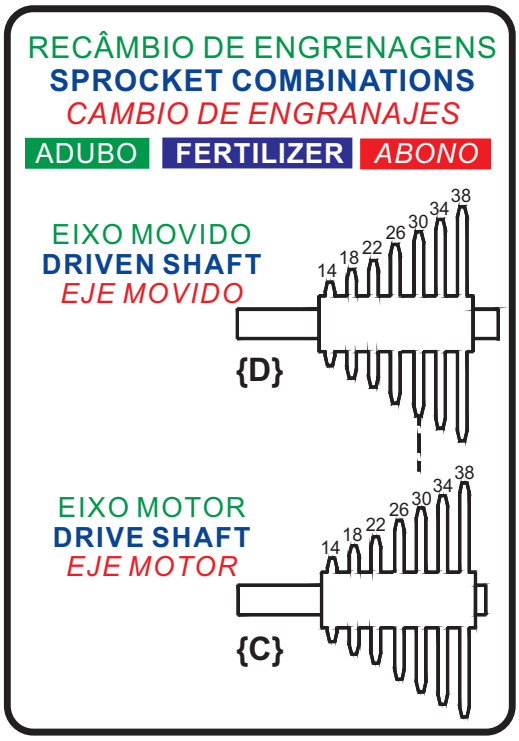
The fertilizer distribution is made through the augers and the different rates are adjusted by the sprocket combinations of the Drive Shaft {C} (14, 18, 22, 26, 30, 34 and 38 teeth) and Driven Shaft {D} (14, 18, 22, 26, 30, 34 and 38 teeth).

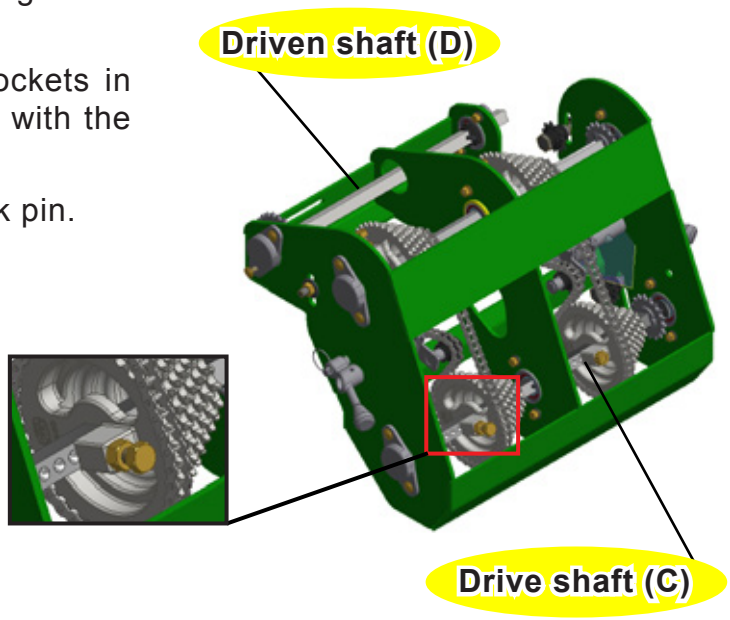
Procedures to change the sprocket

• Move the lever to relieve the chain tightener and lock it using a pin.

• Manually displace the set of sprockets in the shaft and align the chosen sprocket with the chain.

• Release the lever to loose the lock pin.





NOTE

The cone bolts on the sprockets handling "TRA" are pre-adjusted on the factory, allowing to change the sprockets without using any tool. In case of any sliding motion on the cone shaft, just release the counter nut and turn around the bolt to re-lock.

In order to avoid damage to the spring and shafts, never apply excessive torque when tightening.

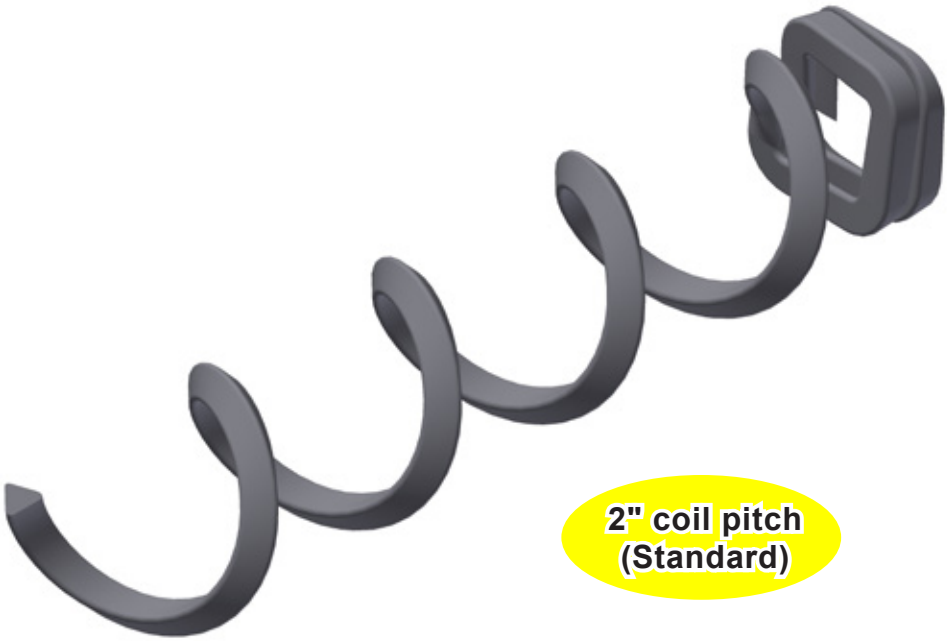
IMPORTANT

See the different amounts of fertilizer distributed for several spacings, according to the sprocket combinations.

The seed and fertilizer distribution tables of this manual must be used as a reference to start the planter adjustment. Factors such as the slippage index of the planter wheels (skidding), working speed, tire inflation, field conditions, seed type and others can make the values differ from the ones in the table. Therefore, it is always indispensable to make the practical distribution tests, as indicated on page 50.

ATTENTION

- **The table {A} on the following page shows the obtained amount with the 2" coil pitch augers (standard). This auger transports approximately 35 grams of granulated commercial fertilizer per turn.**
- **The table {B} on the following page shows the obtained amount with the 1" coil pitch augers (optional). This auger transports approximately 17 grams of granulated commercial fertilizer per turn.**



2" coil pitch (Standard)

1" coil pitch (Optional)

DISTRIBUTION TABLE OF GRANULATED COMMERCIAL FERTILIZER - Amount in kg/ha (Kilograms per hectare) - Augers of 2" (50,8 mm) coil pitch - STANDARD

SPROCKETS Drive shaft {C} Driven shaft {D}		14x38	14x34	14x30	18x38	18x34	14x26	22x38	18x30	14x22	22x34	26x38	18x26	22x30	26x34	14x18	30x38	18x22	22x26	26x30	30x34	34x38	22x22	38x34	34x30	30x26	26x22	22x18	38x30	18x14	34x26	30x22	26x18	38x26	34x22	22x14	30x18	38x22	26x14	34x18	38x18	30x14	34x14	38x14
Grams in 50 m Per row		***307***	***343***	***389***	***395***	***441***	***449***	***483***	***500***	***530***	***539***	***570***	***577***	***611***	***637***	***648***	***658***	***682***	***705***	***722***	***735***	***746***	***834***	***932***	***945***	***962***	***985***	***1019***	***1056***	***1072***	***1090***	***1137***	***1204***	***1218***	***1288***	***1310***	***1389***	***1440***	***1548***	***1575***	***1760***	***1786***	***2024***	***2263***
ROW SPACINGS (mm)	**400**	154	172	194	197	221	224	241	250	265	270	285	289	306	319	324	329	341	353	361	368	373	417	466	472	481	493	509	528	536	545	568	602	609	644	655	695	720	774	787	880	893	1012	1131
	450	136	153	173	175	196	199	214	222	236	240	253	256	272	283	288	292	303	313	321	327	331	370	414	420	427	438	453	469	476	484	505	535	541	573	582	617	640	688	700	782	794	900	1006
	500	123	137	156	158	177	180	193	200	212	216	228	231	245	255	259	263	273	282	289	294	298	333	373	378	385	394	408	422	429	436	455	482	487	515	524	556	576	619	630	704	714	810	905
	550	112	125	141	144	160	163	175	182	193	196	207	210	222	232	236	239	248	256	263	267	271	303	339	344	350	358	370	384	390	396	413	438	443	468	476	505	524	563	573	640	650	736	823
	600	102	114	130	132	147	150	161	167	177	180	190	192	204	212	216	219	227	235	241	245	249	278	311	315	321	328	340	352	357	363	379	401	406	429	437	463	480	516	525	587	595	675	754
	650	94	106	120	121	136	138	148	154	163	166	175	178	188	196	199	202	210	217	222	226	229	256	287	291	296	303	313	325	330	335	350	370	375	396	403	427	443	476	484	541	550	623	696
	700	88	98	111	113	126	128	138	143	152	154	163	165	175	182	185	188	195	202	206	210	213	238	266	270	275	281	291	302	306	311	325	344	348	368	374	397	411	442	450	503	510	578	646
	750	82	92	104	105	118	120	129	133	141	144	152	154	163	170	173	175	182	188	193	196	199	222	248	252	256	263	272	282	286	291	303	321	325	344	349	370	384	413	420	469	476	540	603
	800	77	86	97	99	110	112	121	125	133	135	143	144	153	159	162	165	171	176	181	184	186	208	233	236	240	246	255	264	268	273	284	301	305	322	327	347	360	387	394	440	447	506	566
	850	72	81	92	93	104	106	114	118	125	127	134	136	144	150	153	155	160	166	170	173	175	196	219	222	226	232	240	248	252	256	267	283	287	303	308	327	339	364	370	414	420	476	532
	900	68	76	86	88	98	100	107	111	118	120	127	128	136	142	144	146	152	157	161	163	166	185	207	210	214	219	226	235	238	242	253	268	271	286	291	309	320	344	350	391	397	450	503
	950	65	72	82	83	93	94	102	105	112	114	120	121	129	134	136	139	144	148	152	155	157	175	196	199	202	207	214	222	226	229	239	253	256	271	276	292	303	326	331	370	376	426	476

NOTE: WE RECOMMEND TO MAKE A PRACTICAL TEST OF FERTILIZER DISTRIBUTION ALONG 50 LINEAR METERS AND COMPARE WITH THE 3RD LINE OF THIS TABLE **(Grams in 50 meters).**
THE TEST SHOULD BE MADE IN THE OWN FIELD WHERE THE PLANTATION WILL TAKE PLACE AND IN NORMAL WORKING SPEED. HECTARE = 10.000 m² AVERAGE SPEED - 06 Km/h

05.03.03.1912

DISTRIBUTION TABLE OF GRANULATED COMMERCIAL FERTILIZER - Amount in kg/ha (Kilograms per hectare) - Augers of 1" (25,4 mm) coil pitch - OPTIONAL

SPROCKETS Drive shaft {C} Driven shaft {D}		14x38	14x34	14x30	18x38	18x34	14x26	22x38	18x30	14x22	22x34	26x38	18x26	22x30	26x34	14x18	30x38	18x22	22x26	26x30	30x34	34x38	22x22	38x34	34x30	30x26	26x22	22x18	38x30	18x14	34x26	30x22	26x18	38x26	34x22	22x14	30x18	38x22	26x14	34x18	38x18	30x14	34x14	38x14
Grams in 50 m Per row		***149***	***167***	***189***	***192***	***214***	***218***	***234***	***243***	***258***	***262***	***277***	***280***	***297***	***310***	***315***	***320***	***331***	***343***	***351***	***357***	***362***	***405***	***453***	***459***	***467***	***478***	***495***	***513***	***521***	***529***	***552***	***585***	***592***	***626***	***636***	***675***	***699***	***752***	***765***	***855***	***868***	***983***	***1099***
ROW SPACINGS (mm)	**400**	75	83	94	96	107	109	117	121	129	131	139	140	148	155	157	160	166	171	175	179	181	202	226	229	234	239	247	256	260	265	276	292	296	313	318	337	350	376	382	427	434	492	549
	450	66	74	84	85	95	97	104	108	115	116	123	125	132	138	140	142	147	152	156	159	161	180	201	204	208	213	220	228	231	235	245	260	263	278	283	300	311	334	340	380	386	437	488
	500	60	67	76	77	86	87	94	97	103	105	111	112	119	124	126	128	133	137	140	143	145	162	181	184	187	191	198	205	208	212	221	234	237	250	254	270	280	301	306	342	347	393	440
	550	54	61	69	70	78	79	85	88	94	95	101	102	108	113	115	116	120	125	128	130	132	147	165	167	170	174	180	186	189	193	201	213	215	228	231	245	254	273	278	311	315	358	400
	600	50	56	63	64	71	73	78	81	86	87	92	93	99	103	105	107	110	114	117	119	121	135	151	153	156	159	165	171	174	176	184	195	197	209	212	225	233	251	255	285	289	328	366
	650	46	51	58	59	66	67	72	75	79	81	85	86	91	95	97	98	102	105	108	110	111	125	139	141	144	147	152	158	160	163	170	180	182	193	196	208	215	231	235	263	267	303	338
	700	43	48	54	55	61	62	67	69	74	75	79	80	85	88	90	91	95	98	100	102	104	116	129	131	133	137	141	147	149	151	158	167	169	179	182	193	200	215	219	244	248	281	314
	750	40	44	50	51	57	58	63	65	69	70	74	75	79	83	84	85	88	91	94	95	97	108	121	122	125	128	132	137	139	141	147	156	158	167	170	180	186	201	204	228	231	262	293
	800	37	42	47	48	54	55	59	61	64	65	69	70	74	77	79	80	83	86	88	89	91	101	113	115	117	120	124	128	130	132	138	146	148	156	159	169	175	188	191	214	217	246	275
	850	35	39	44	45	50	51	55	57	61	62	65	66	70	73	74	75	78	81	83	84	85	95	106	108	110	113	116	121	122	125	130	138	139	147	150	159	165	177	180	201	204	231	259
	900	33	37	42	43	48	48	52	54	57	58	62	62	66	69	70	71	74	76	78	79	81	90	101	102	104	106	110	114	116	118	123	130	131	139	141	150	155	167	170	190	193	219	244
	950	31	35	40	40	45	46	49	51	54	55	58	59	63	65	66	67	70	72	74	75	76	85	95	97	98	101	104	108	110	111	116	123	125	132	134	142	147	158	161	180	183	207	231

NOTE: WE RECOMMEND TO MAKE A PRACTICAL TEST OF FERTILIZER DISTRIBUTION ALONG 50 LINEAR METERS AND COMPARE WITH THE 3RD LINE OF THIS TABLE **(Grams in 50 meters).**
THE TEST SHOULD BE MADE IN THE OWN FIELD WHERE THE PLANTATION WILL TAKE PLACE AND IN NORMAL WORKING SPEED. HECTARE = 10.000 m AVERAGE SPEED - 06 Km/h

05.03.03.1911

IMPORTANT **The data on the previous tables (seed and fertilizer) can vary due to several factors. Therefore, carefully observe the following procedures.**

Practical test of seed and fertilizer distribution

The most indicated way to assess the amount of seed and fertilizer rate is performing the test on the same field the plantation will take place, following these steps:

- Whenever it is possible, use the same tractor and operator to perform the plantation.
- The correct inflation of the planter tires is important to maintain uniformity in the plantation. Keep the same pressure on all tires **(75 PSI)**.
- Mark the distance for test. Fertilizer table example: 50 linear meters.
- Fill up the planter hoppers at least to the half and then travel some meters to completely fill the distributors before entering in the delimited area.
- Place the collection bags in the fertilizer dispensers (preferably use plastic bags). In the seed dispensers, use cotton waste to hinder the exits.
- Drive the tractor in the delimited space, using the same speed that will be used in the whole plantation.
- Recommended speeds:

  5 to 5.5 km/h for corn and sunflower plantation.

  6 to 6.5 km/h for bean / sorghum / acid delinted cotton plantation.

  7 km/h for soybean plantation.
- Weigh the fertilizer contained in the bags and compare it to the second line of the previous tables (grams in 50 meters per row unit).
- Remove the cotton waste of the seed dispensers, picking up the seeds for counting.
- Compare with the table and, if necessary, redo the tests changing the adjustments.
- After getting the desired amount and still in the field, move the tractor in the same speed, leaving the fertilizer and the seed to reach the soil for better verifying the distribution uniformity.

ATTENTION

- **The work speed variation affects the uniform seed distribution.**
- **When there is a change in the batch of seeds as well as in the fertilizer manufacturer, everything must be assessed again.**
- **It is important to assess all adjustments again after the first day of work.**

Auxiliary calculation for the fertilizer distribution

To distribute other amounts of fertilizer in different spacings and areas from those presented in the tables we suggest a quick calculation, where all used data can be changed to one of your own interest. Use the formula below, which contains the following elements:

A = Area to be fertilized (m^2).

B = Spacing between rows of the crop (m).

C = Amount of fertilizer to be distributed in the area (Kg).

D = Distance to travel for the distribution test (m).

X = How many grams should be dropped in "d"?

Formula

$$X = \frac{B \times C \times D}{A}$$

Example

A = 10,000 m^2

B = 0.90 m

C = 250 kg

D = 50 m

X = ?

$$X = \frac{0.90 \times 250 \times 50}{10{,}000}$$

$$X = \frac{11{,}250}{10{,}000}$$

X = 1,125 kg or

X = 1,125 grams in 50 meters in each row unit.

Adjust the equipment to distribute the found amount or the best approximation in the delimited space for the test.

Oscillating coulter blades (no-till)

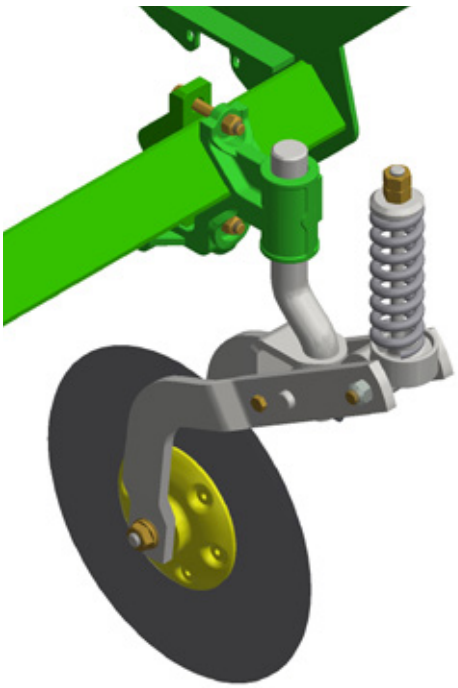
The coulter blades possess lateral oscillation movements to follow the curves in the field.

During work, **do not perform sharp turns.** This act can cause damage to the row components.

The vertical oscillation (or flotation) of the coulter blades is provided by the springs, which allows the necessary articulation to follow the soil profile and to transpose obstacles.

The coulter blades support have a height adjustment and it should be used to increase or to decrease the depth cut of the coulter blades related to the soil.

Avoid to deepen the coulter blades unnecessarily.

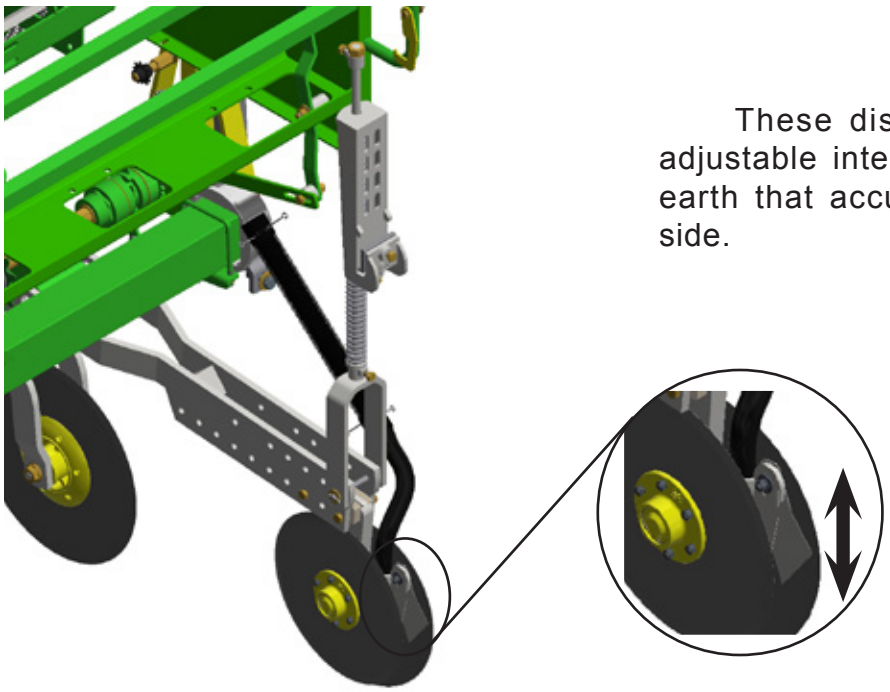


Furrow opening and fertilizer position in the soil

Fertilization on the same row and below the seed (either to the direct and conventional system).

The furrow opening for the fertilizer placement can be done by the unaligned double discs or scarifier spindle.

Unaligned double discs



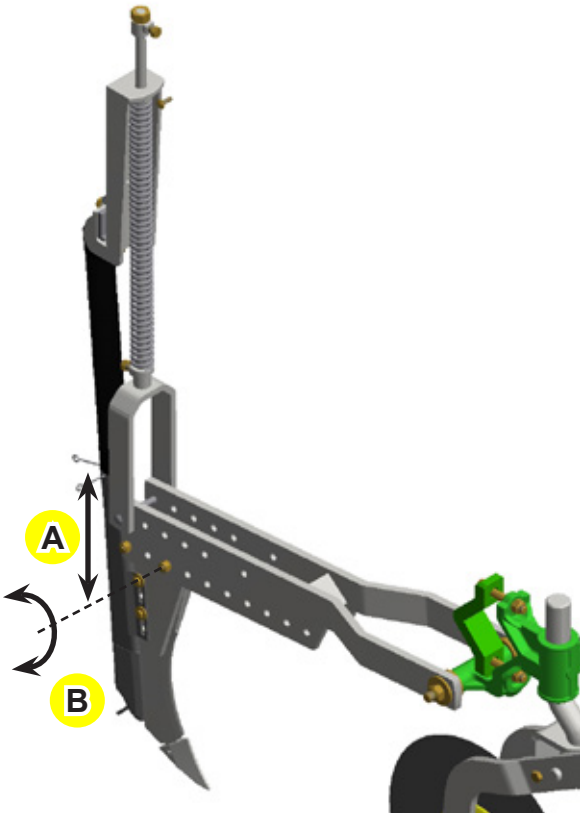
These discs feature flexible and adjustable internal scrapers to remove earth that accumulate in their internal side.

Scarifier spindle

The scarifier spindles feature height adjustment (A) in the fertilizer dispensers, regardless of the rods, allowing the placement of the product in different depths, regardless of the rods working depth.

The working angle (B) of the rods can also be adjusted according to the soil hardness. For hard soils use the superior hole of the scarifier, leaving it in vertical position.

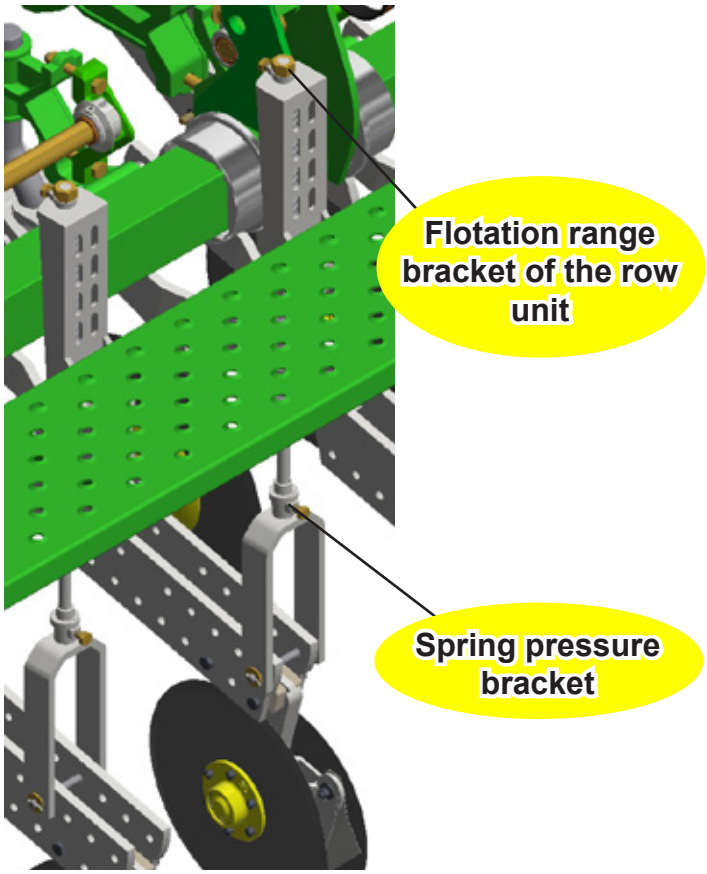
During work, do not make sharp turns. This act can cause damage to the row components.



NOTE **Assemble the scarifier spindles as unaligned as possible between the long and short rows.**

Fertilizer depth and flotation range of the row units

The brackets on the lower part of the rod adjust the depth, according to the alteration in the working pressure of the springs. The flotation range of the row units is fitting by the adjustment established by the rod.



NOTE **The fertilizer position related to the seed should be carefully observed. The ideal is to deposit the fertilizer twice as much of the seed depth.**

Opening the seed furrows

The furrows for seeds are open through unaligned double discs; which possess flexible and adjustable scrapers in order to remove the earth that accumulate in their internal parts.

The seed rows feature adjustments to control the working pressure over the soil:

Holes in the upper bar of the parallelogram.

"1" - Greater pressure.

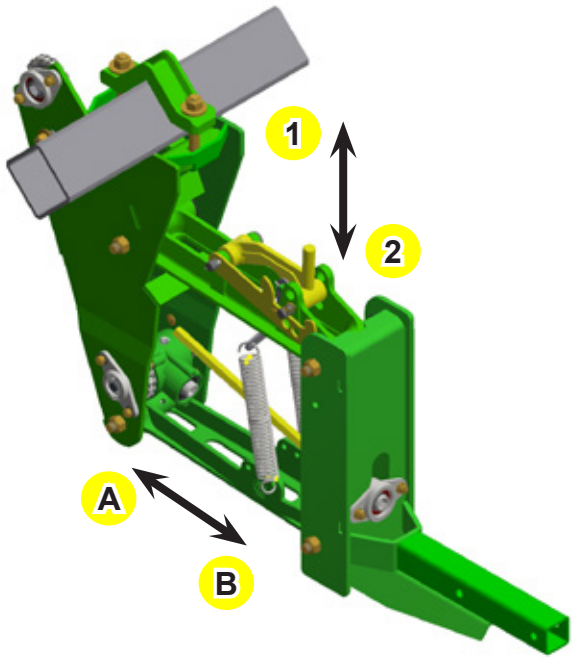
"2" - Smaller pressure.

Holes in the lower bar of the parallelogram.

"A" - Greater pressure.

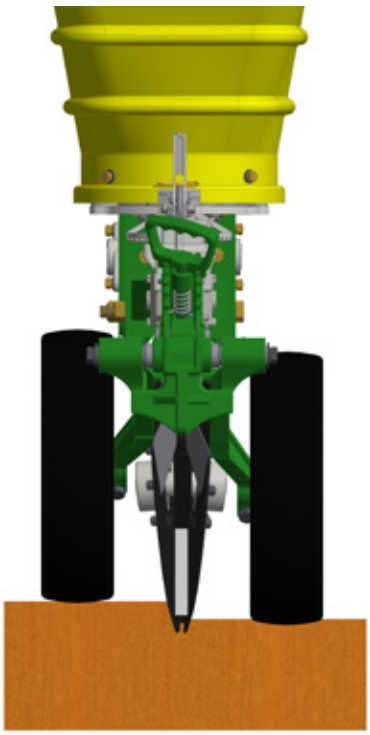
"B" - Smaller pressure.

Set the same adjustment for every row unit.

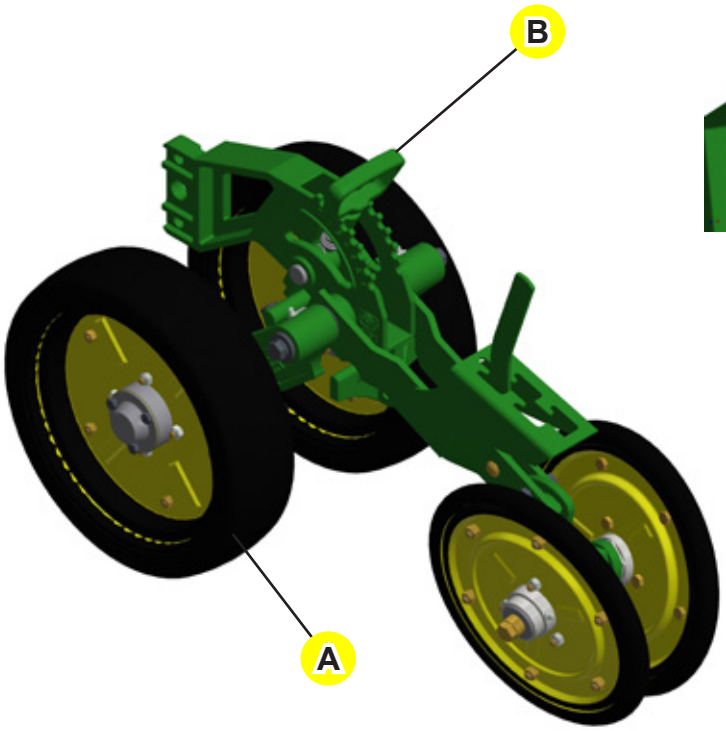


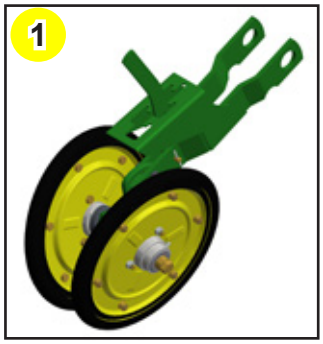
Seed depth and floating range of the row unit

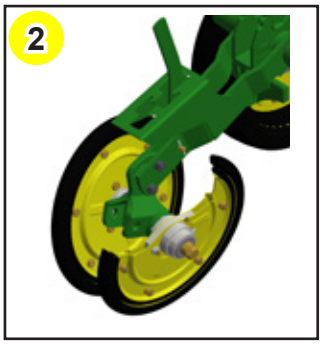
The seed depth control is made individually through the gauge wheels (A), which possess adjustments through the handler (B). The graduation allows to adjust the seed depth in intervals of **0.5 cm** or **1 cm**. (See illustration on the next page).

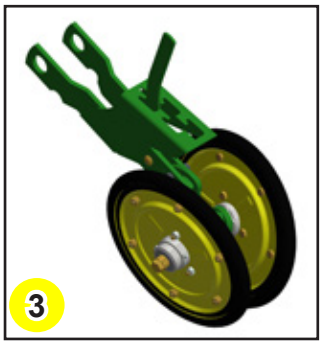


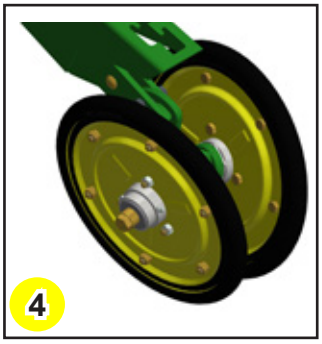
NOTE **The depth gauge wheels possess independent lateral and vertical oscillation to follow the differences of the ground ondulation.**











The press wheels in "V" shape firm the soil around the seed and are able to work in several positions according to the soil type and conditions of the straw.

1) Make the correct adjustment of the floating range and the downward pressure by the lever that allows to operate in four positions and one neutral position.

2) Adjust the angle between the press wheels (vertex) by the bolt and slot.

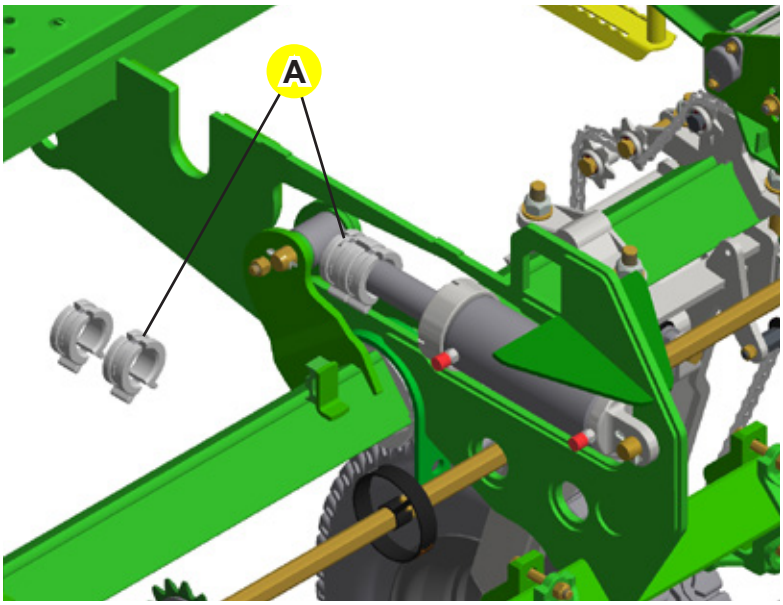
3) Make the unalignment between the press wheels by the bolts.

4) Increase or decrease the lateral distance between the wheels through the spacer spools, passing the washers to the internal part of the shaft.

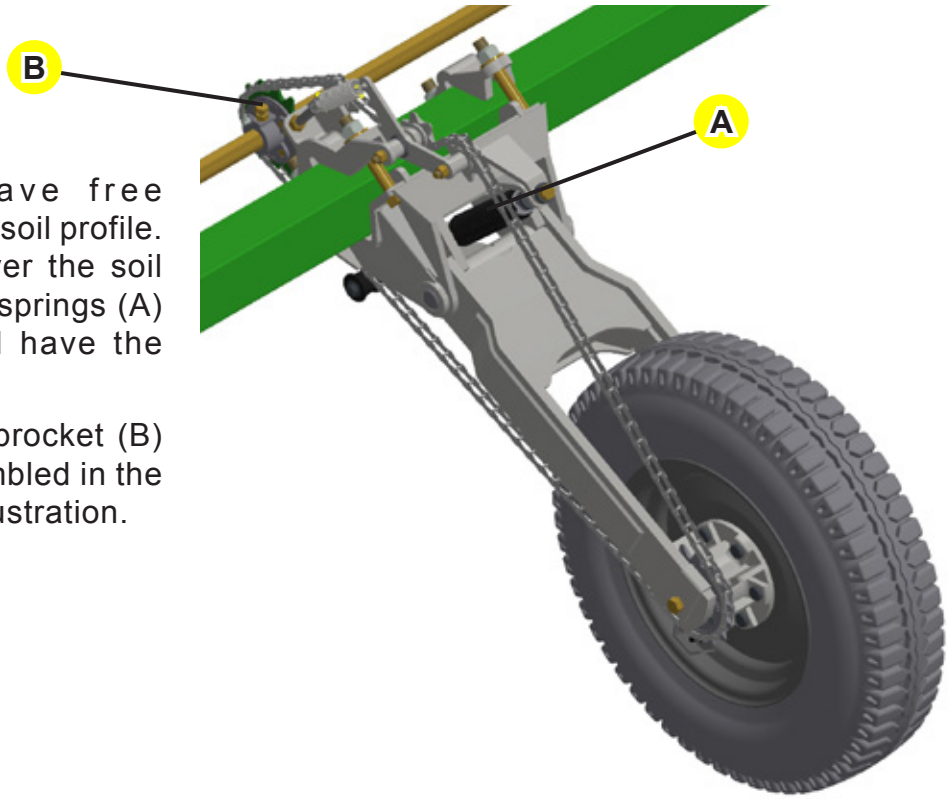
NOTE **While adjusting the press wheels it is important to consider the soil type, seed type and depth of planting to not affect the plants emergence.**

Auxiliary depth control

In light and loose soils (sandy) the utilization of the rod stops (A) may be necessary to help in the depth control.



Wheel springs adjustment



The wheels have free articulation to follow the soil profile. The wheel pressure over the soil can be adjusted by the springs (A) and all wheels should have the same adjustment.

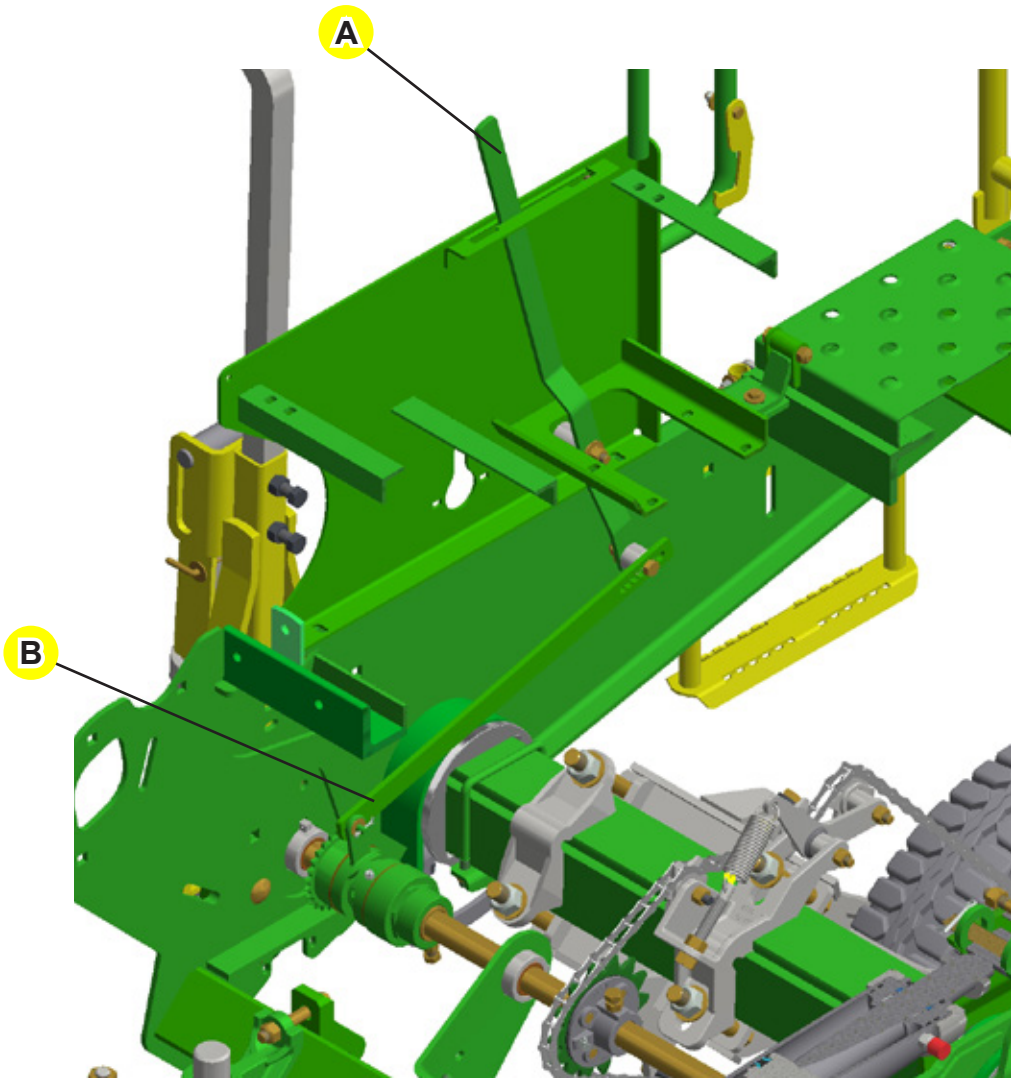
The free-turning sprocket (B) should be always assembled in the same position as the illustration.

NOTE

- **Always use the same inflation in the tires.**
- **Always use tires that have the same design and width to start planting.**
- **If necessary, put 3/4 of water in the tires and keep the same inflation.**

Finishing instructions

The clutches can toggle the seed and fertilizer distribution to on or off automatically but can also be turned off manually so it is possible to perform the finishings and it just uses half planter. In order to do so, activate the lever (A) to turn off the clutches.



NOTE **If the clutch is not disassembling, the adjustment can be done by the intermediate bar (B).**

Row markers

The row marker utilization is very important to achieve an uniform spacing in the plantation, thus facilitating the cultivation and harvest.

NOTE **For this practical adjustment it is necessary to keep the front and rear gauges with the same measure, being the central measure of the front tires equal to the rear ones.**

Follow the instructions that goes along with the illustration on the next page.

To adjust the marker discs it is just necessary to loosen the nuts and displace the extensor to the desired position. This distance can be obtained as follows:

• Drive some meters on a prepared soil, being the planter hitched.

• Measure the distance (A) between the center of the tractor trace and the center of the first seed row (row in the planter extremity).

• Sum up the found measure with the spacing between rows (B) measure, considering the spacing that is being used in the equipment.

• The result is the distance (C) that should exist between the row marker disc and the center of the first seed row (row in the planter extremity).

Example:

A - Tractor trace center to the center of the first seed row = 800 mm.

B - Spacing between row crops = 500 mm.

C - Distance to be found (?).

So A + B = C

800 + 500 = 1,300 mm

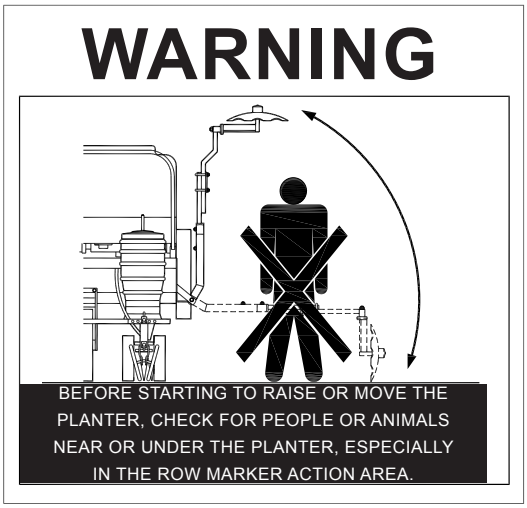
C = 1,300 mm

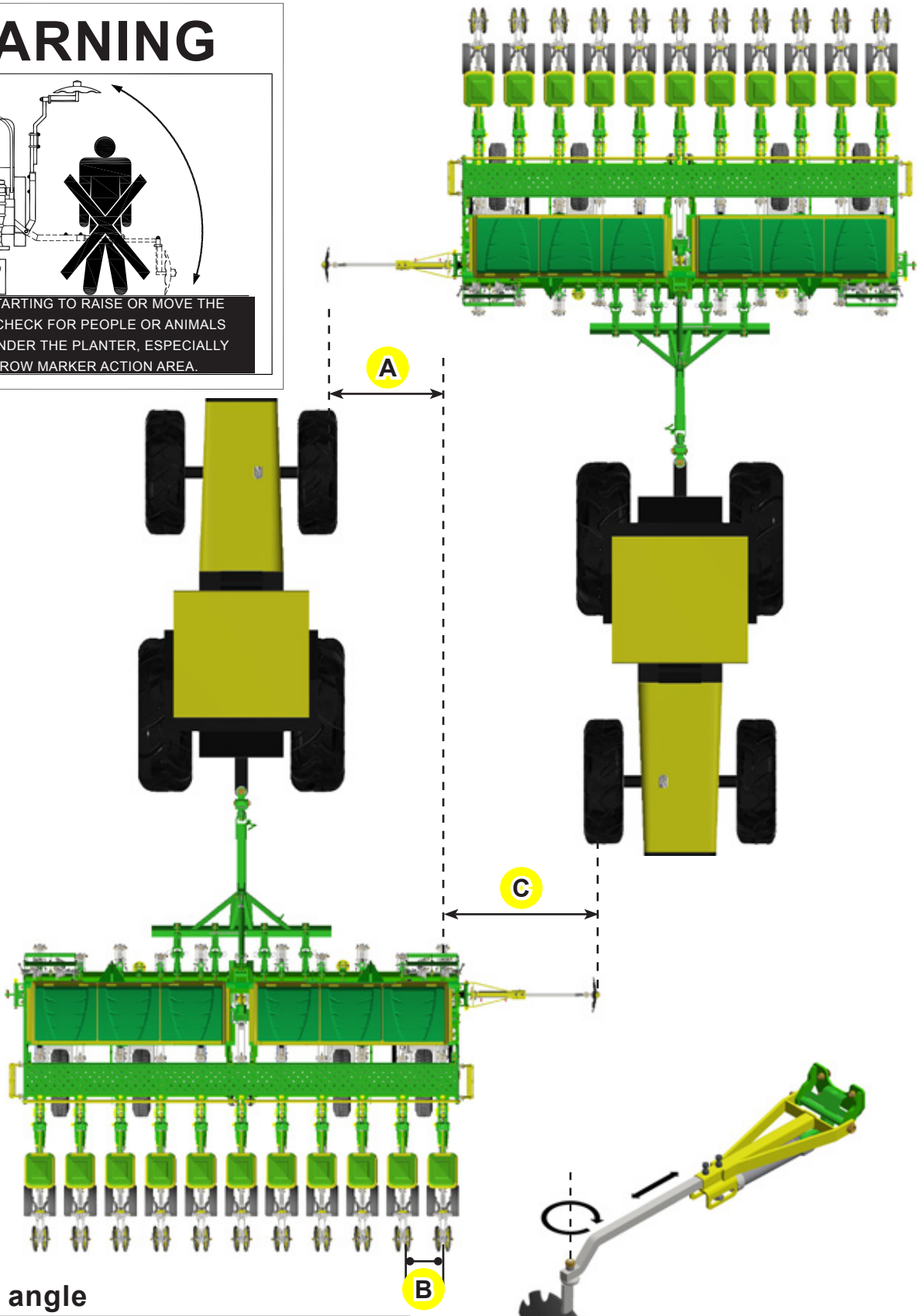
This is the distance between the center of the first seed row and the marker disc lowered to the soil.

Sequence valve operation

For the correct operation of the sequence valve and the proper alternation of the row markers, it is necessary to always activate the command lever until the hydraulic cylinders stroke is completed and keep the lever activated for more three or four seconds.

NOTE **Never activate the hydraulic cylinders partially. Either when raising or lowering the planter, fully activate it.**





Working angle

The marker discs feature angle and distance adjustments to facilitate the soil opening. In order to do so, loosen the nut and adjust as necessary.

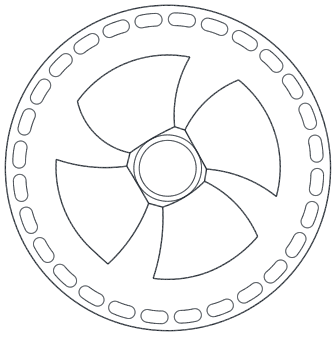
Operations - Important points

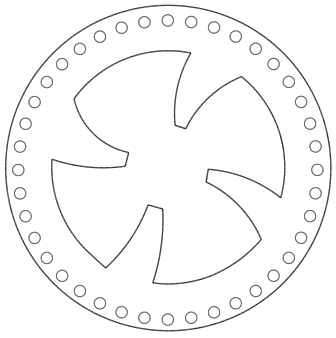
- Retighten nuts and bolts after the first day of planting. Check the conditions of all pins and cotter pins.
- Carefully observe the lubrication intervals.
- The correct inflation of the tires is important to maintain the planting uniformity. Keep the same inflation for all tires **(75 PSI)**.
- When filling the planter, observe its proper hitching to the tractor. Verify if there is any object inside the hoppers that may cause damage to the metering devices.
- Always use seeds and fertilizer free from impurities.
- Inspect the seed metering systems twice a day and observe the functioning of the fertilizer dispenser system.
- Keep the equipment leveled.
- Periodically check the established adjustments in the beginning of the plantation.
- Give special attention to the fertilizer position in the soil, related to the seeds.
- Carefully check the seed depth and the compaction pressure.
- It is important to maintain a constant speed in the whole plantation.
- The tractor drawbar must remain fixed.
- Use the row markers correctly to avoid future wastes.
- Never make maneuvers or use reverse gear when the rows are touching the soil.
- Never make sharp turns during the service, especially in a no-till plantation. The row components may be damaged.
- To make any verification in the equipment, it is necessary to lower it to the ground and shut down the tractor engine.
- During working or transportation, the presence of passengers on the tractor or equipment is not allowed.
- As previously mentioned, the planter features several adjustments. However, only the local conditions can determine the best adjustment thereof.
- For adjustment and verification of the cutting parts (row units) of the equipment, it is necessary to disconnect the clutches to avoid wastes.

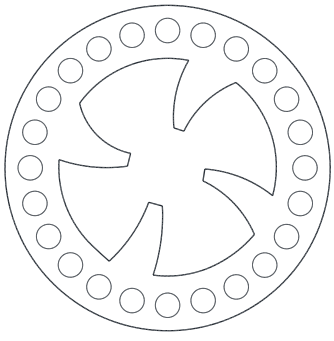
Seed plates

Optionally, MARCHESAN supplies slotted or perforated seed plates for several crops, according to the list below:

Seed plates	Amount of holes / slots	Hole / slot dimension	Thickness	Serial number
Corn (Black)	28 slots	15.5 x 11.5 mm	4 mm	05.03.01.6194
Corn (Red)	28 slots	14.5 x 10 mm	4 mm	05.03.01.6195
Corn (Green)	28 slots	13.5 x 9 mm	4 mm	05.03.01.6196
Corn (Salmon)	28 slots	12.5 x 8.5 mm	4 mm	05.03.01.6197
Corn (Gray)	28 slots	12.3 x 9.4 mm	4 mm	05.03.01.6198
Corn (White)	28 slots	11.5 x 8.5 mm	4 mm	05.03.01.6199
Corn (Pumpkin)	28 slots	11 x 8 mm	4 mm	05.03.01.6200
Corn (Gray)	28 holes	13.5 mm	4 mm	05.03.01.6201
Corn (Pink)	28 holes	13 mm	4 mm	05.03.01.6202
Corn (Light blue)	28 holes	12.5 mm	4 mm	05.03.01.6203
Corn (Light green)	28 holes	11.5 mm	4 mm	05.03.01.6205
Corn (Blue)	28 holes	10.5 mm	4 mm	05.03.01.6207
Corn (Yellow)	28 holes	10 mm	4 mm	05.03.01.6208
Corn (Gray)	28 holes	9.5 mm	4 mm	05.03.01.6209
Corn (Dark green)	28 holes	9 mm	4 mm	05.03.01.6210
Corn (Purple)	28 holes	8 mm	4 mm	05.03.01.6211
Corn (Red)	28 holes	14 mm	4 mm	05.03.01.6212
Corn (Black)	28 holes	15 mm	4 mm	05.03.01.6213
Ring for corn with recess of 1.0 mm (Green)	——	——	1 mm	05.03.01.6215
Ring for corn with recess of 2.0 mm	——	——	2 mm	05.03.01.6216

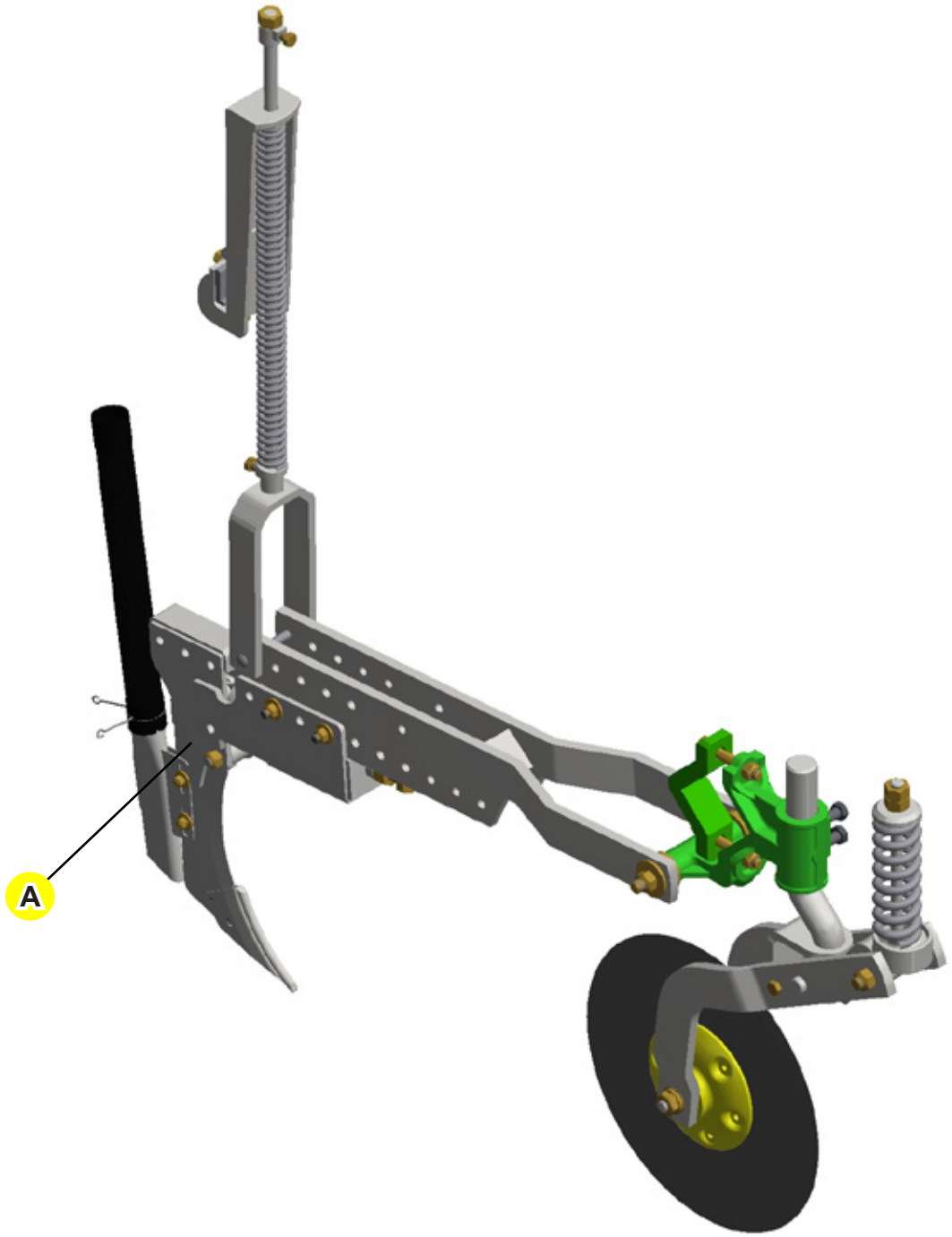






Automatic reset spindle

Marchesan optionally supplies an automatic reset spindle (A).

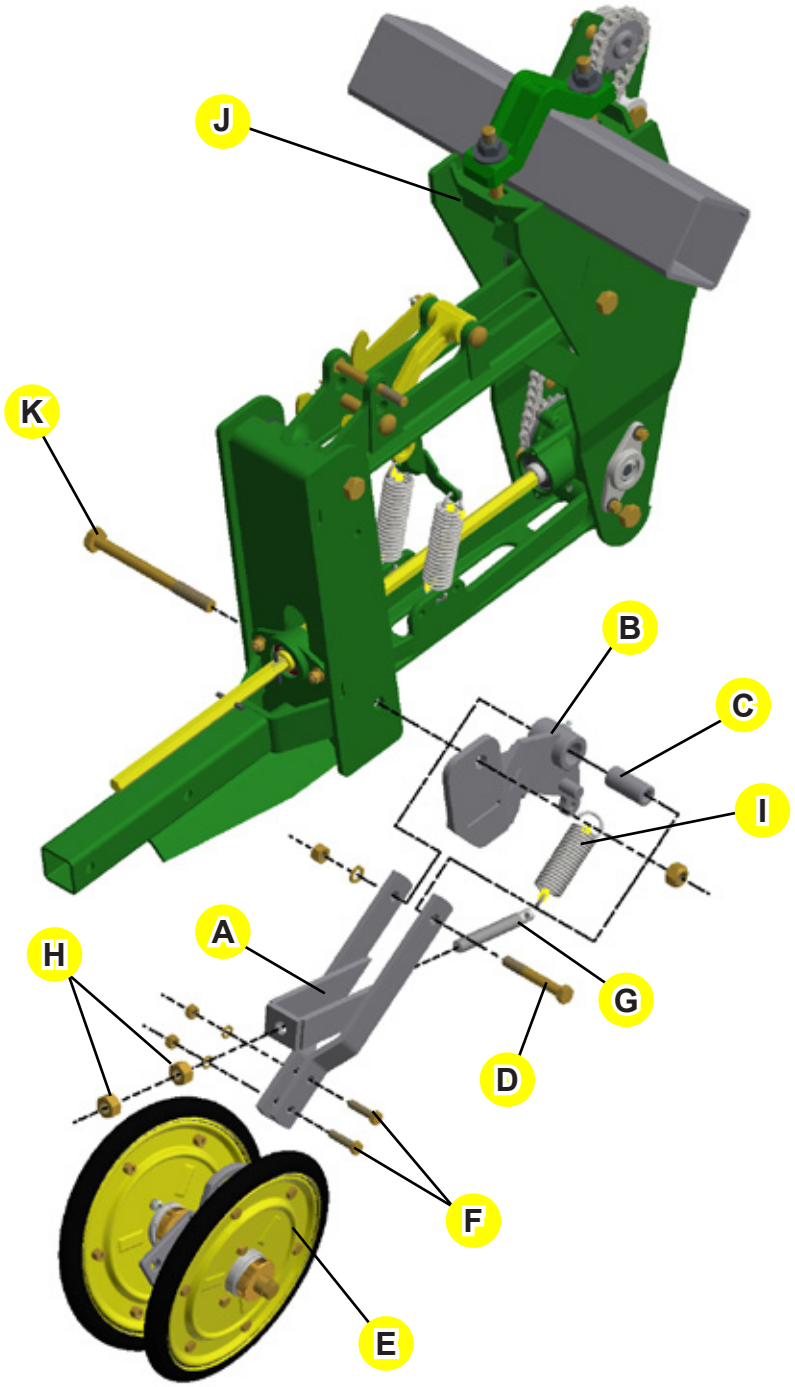


Wheels for fertilizer covering

• Assemble the arm (A) of the covering wheel for fertilizer in the support (B) using the bracket (C), bolt (D), spring washer and nut. Also assemble the covering wheel (E) to the arm (A) using a bolt (F), spring washer and nut.

• Then, assemble the spring tightener (G), locking with nuts (H). Fasten the spring (I) to the tightener and support (B).

• Lastly, fasten the covering wheel set to the parallelogram arm (J) using a bolt (K), spring washer, flat washer and nut.



NOTE The support (B) is right or left to release the tire from the planter.

Depth control wheel with angular adjustment

• Assemble the arm support (A) in the depth control post (B) using the fuse (C) and hexagonal rod (D).

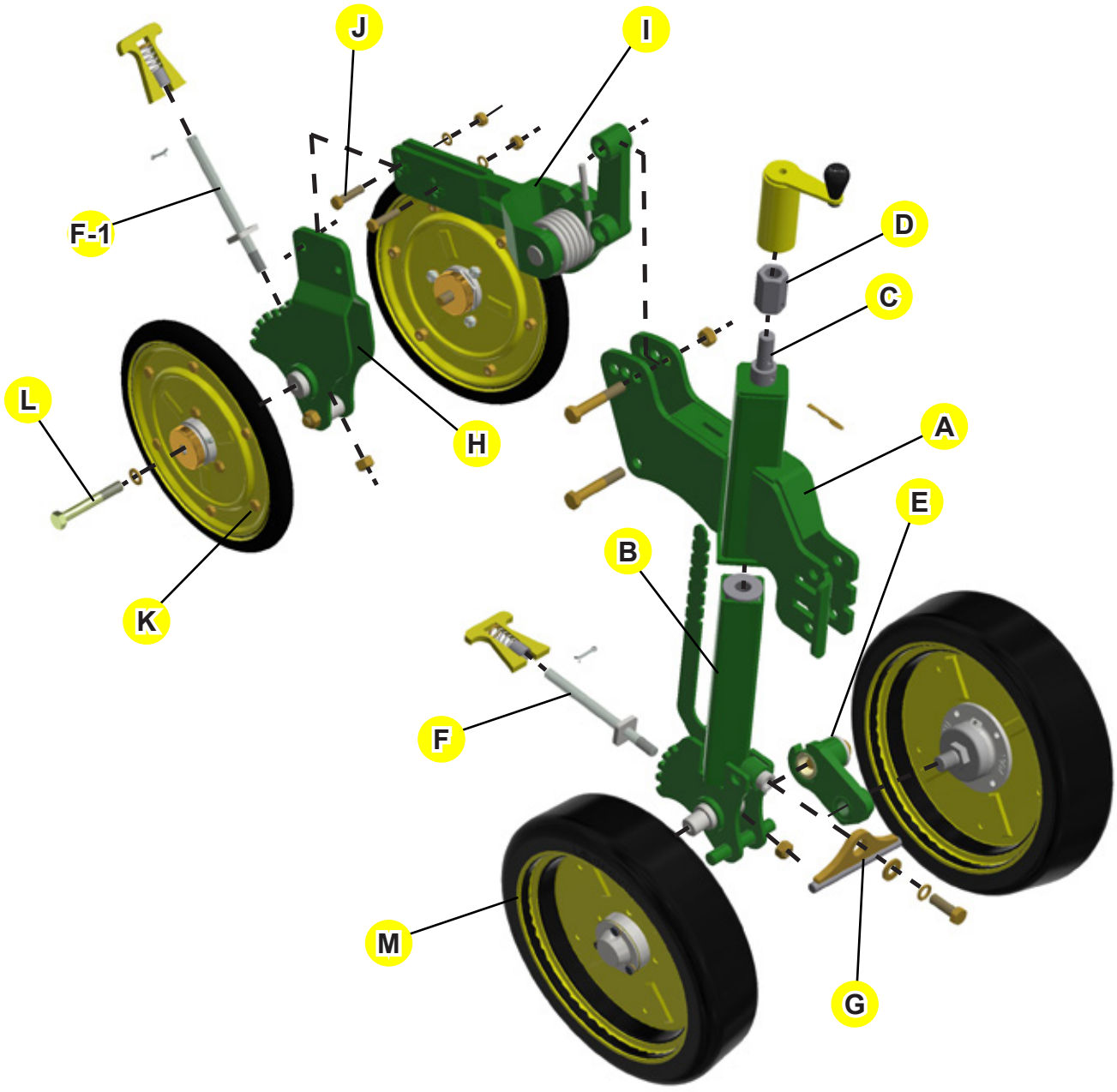
• Attach the covering wheel arm (E) to the inner post (B) using a bolt and spring washer.

• Assemble the adjusting lever (F) to the inner post (B) using a nut, adjusting lock, spring and cotter pin. Then, assemble the covering wheel bumper (G) using a bolt, spring washer and flat washer. Fasten the covering wheel (M) to the inner post (B).

• Assemble the press wheel adjuster (H) to the press wheel arm (I) using a bolt (J), spring washer and nut.

• Assemble the press wheels (K) to the adjuster (H) using a bolt (L) and spring washer. Assemble the lever (F-1) to the adjuster (H).

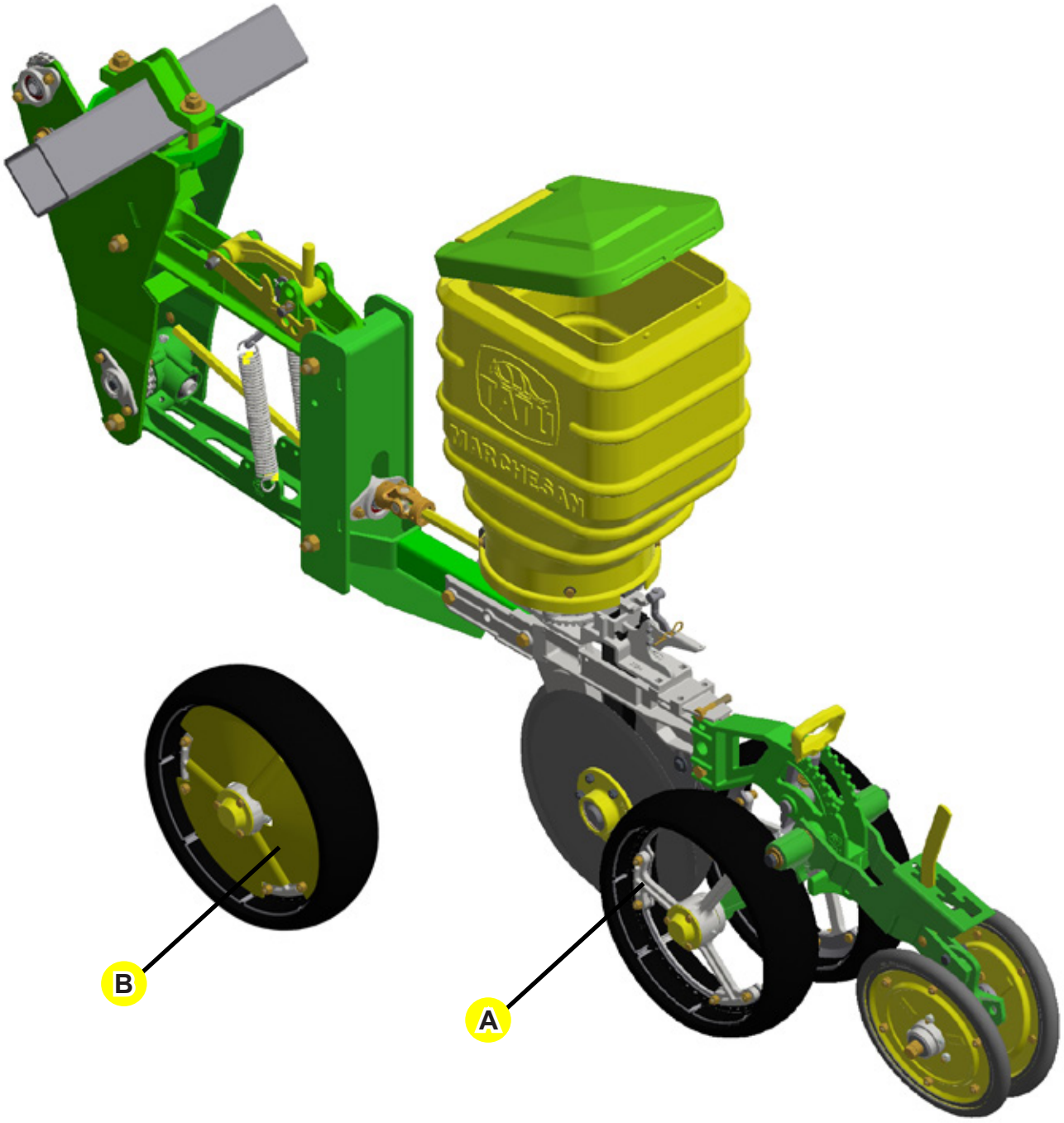
• Join the press wheel arm (I) to the arm support (A) using a bolt and nut.



Row unit with spoke wheel

Marchesan optionally supplies the spoke press wheels (A).

The row unit with spoke press wheel is delivered assembled with a wheel cover (B) that can be removed if necessary.

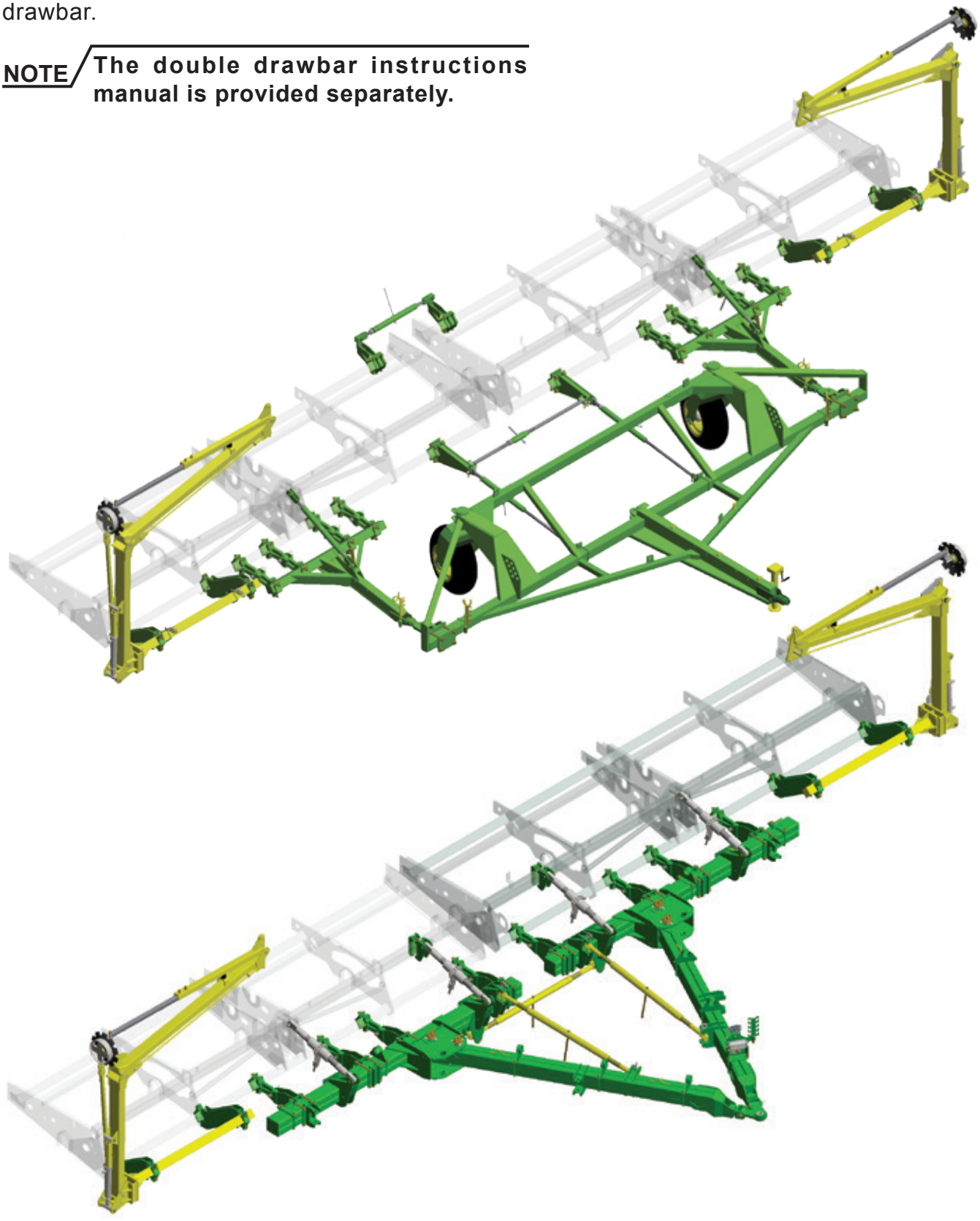


Double drawbar

For the plantation in vast areas and flat topography, the double drawbar is used to join two planters hitched to a single tractor.

We point that the two planters should be from the same model to use the double drawbar.

NOTE **The double drawbar instructions manual is provided separately.**

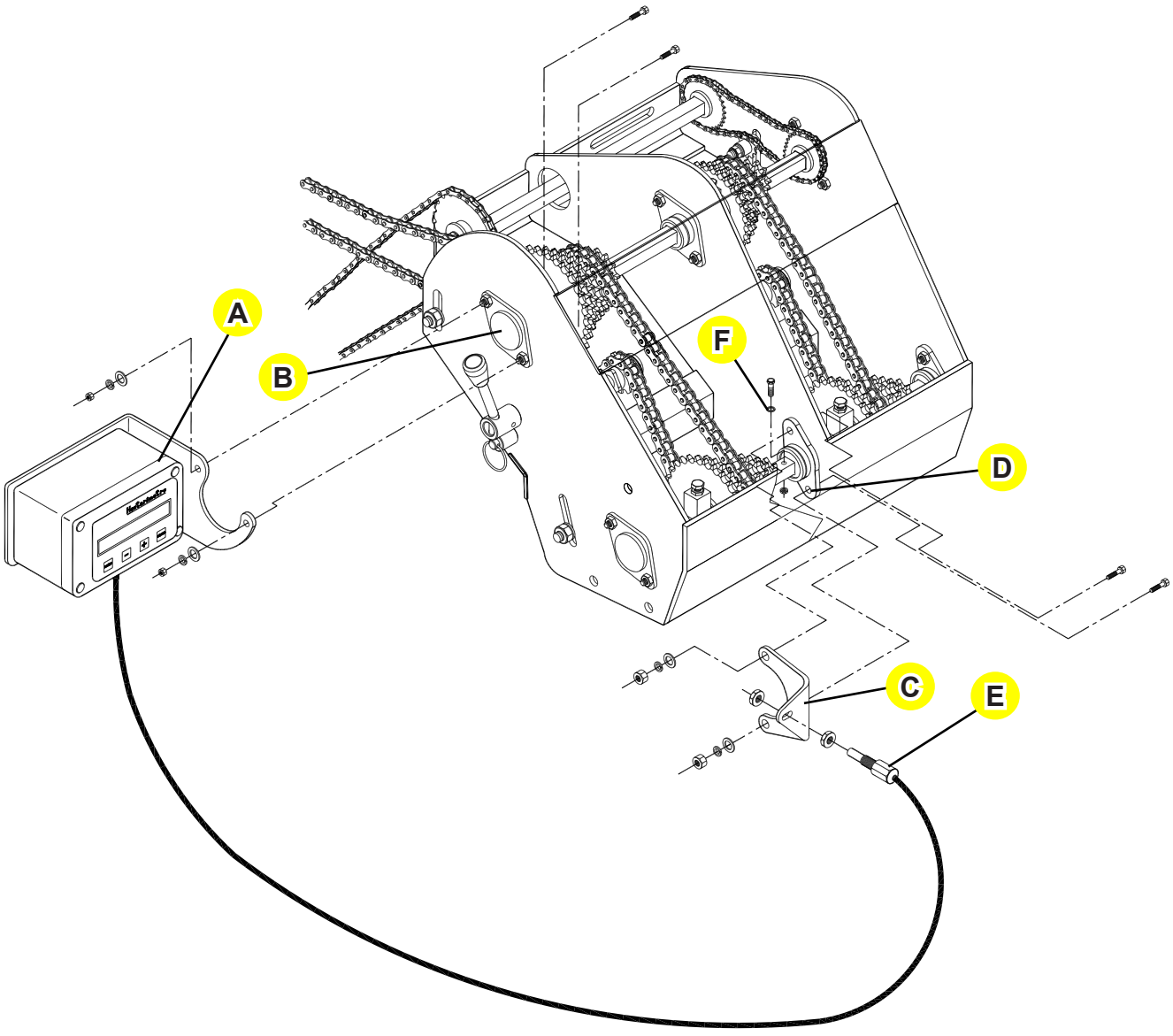


TATU electronic hectarimeter

The TATU electronic hectarimeter measures the area in hectares and brings technology to the agriculture. Use the hectarimeter to measure partial hectare, total hectare and number of turns of the transmission shaft.

See the assembly sequence and instructions below:

Attach the hectarimeter (A) to the iron support and fasten it using bolts to the TRA external part, which will be fasten to the transmission shaft bearing (B) using the bolts already found on the bearing itself. Then, assemble the support (C) to the lower shaft of the bearing, using the same bolts found on the bearing (D). Adjust the sensor (E) in a way that it stays aligned with the magnet (F) at a distance from 3 to 5 mm of the bolt shaft.



TATU electronic hectarimeter

How to operate to consult partial hectare and total hectare:

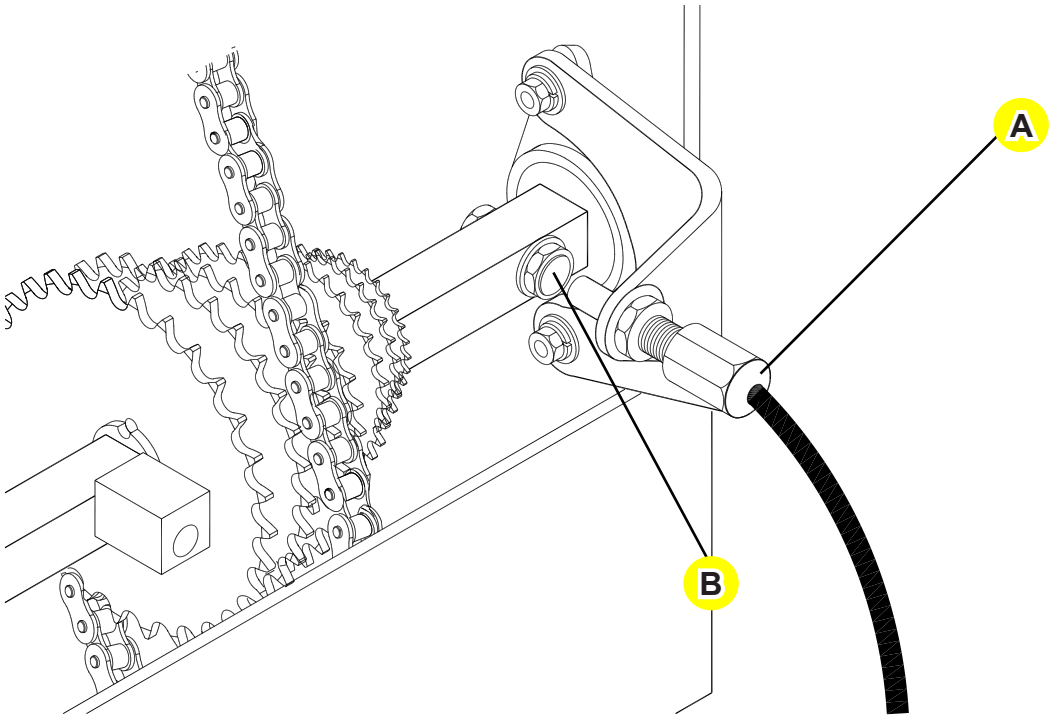
When pressing the MENU key the display will turn on, Marchesan and the battery status will be displayed for five (05) seconds. After this time, the display shows the **partial hectare**.

If the MENU key is pressed again, the display shows the **total hectare**. If no other key is pressed for thirty (30) seconds, the system returns automatically to sleep mode.

How to set the equipment:

Press the MENU key. The display will turn on, Marchesan and the battery status will be displayed for five (05) seconds. After this time the display will exhibit the **partial hectare**. To reset the partial hectare, press and hold the ENTER key for four (04) seconds. The reset options will be displayed, confirm by pressing the + key, otherwise press the - to cancel it.

By pressing the MENU key again the display will show the **total hectare**. Press and hold the - and + keys down simultaneously for five (05) seconds and the display will show the settings, as well as the number of turns. By pressing the MENU key, the display offers you the option to enter the number of rows using the + and - keys. After entering the number of rows, press the MENU key to adjust the spacing between the rows (in mm) using the - and + keys. After entering the data, wait for thirty (30) seconds so the system returns automatically to sleep mode, now adopting the entered values.

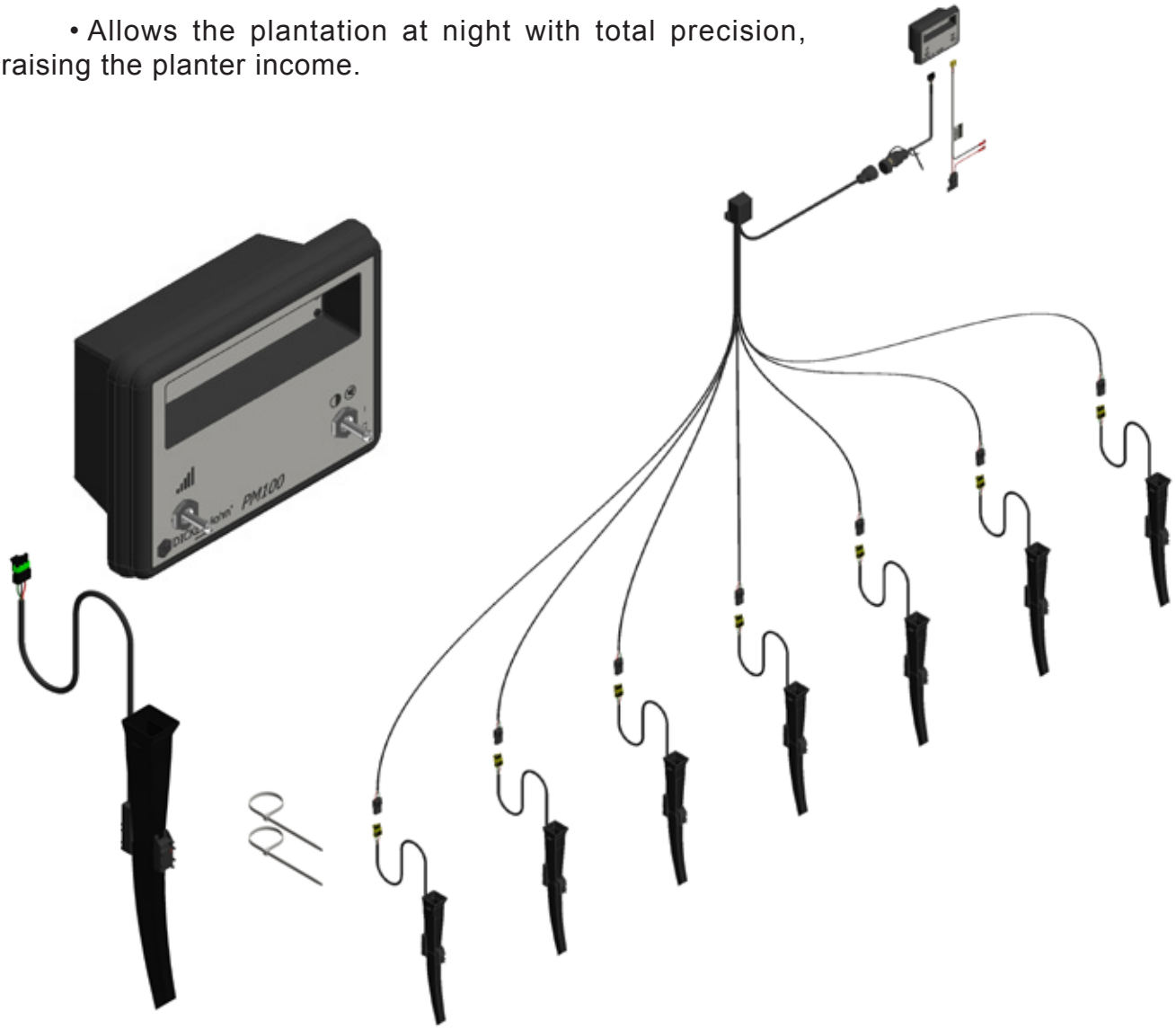


NOTE **After adjusting the amount of seeds, it is necessary to adjust the sensor (A) in a way that it aligns with the magnet (B) of the seed shaft, at a distance from 3 to 5 mm.**

TATU PM 100 monitor

The **TATU PM 100** monitor is designed to suit the needs of each user. It was developed by the world's best seller of planter monitors and offers the finest technology on the market. The TATU PM 100 track seeds in planters up to 16 row units and it is a TATU optional part when a planter is acquired.

- Track seeds - up to a 16-row unit planter;
- Easy and flexible settings - password protected;
- Display mode customizable by the user;
- Audible and visual alarm to indicate flaws in the row units;
- Keeps the information even when there is a lack of energy;
- Gives precise informations, such as: area to be planted, population, spacing between seeds, number of seeds per meter (average, minimum and maximum);
- Informs the plantation speed;
- Allows the plantation at night with total precision, raising the planter income.



NOTE **For more information, consult the PM 100 manual or search for a local representative.**

TATU PM 400 monitor

The **TATU PM 400** monitor is designed to suit the needs of each user. It was developed by the world's best seller of planter monitors and offers the finest technology on the market. The TATU PM 400 track seeds and fertilizer in planters up to 18 row units and it is a TATU optional part when a planter is acquired.

- Tracks seed and fertilizer - with 36 sensors, being 18 for fertilizer and 18 for seeds;
- Easy and flexible settings - password protected;
- Display mode customizable by the user;
- Audible and visual alarm to indicate flaws in the row units;
- Keeps the information even when there is a lack of energy;
- Gives precise informations, such as: area to be planted, population, spacing between seeds, number of seeds per meter (average, minimum and maximum);
- Informs the plantation speed;
- Allows the plantation at night with total precision, raising the planter income.

NOTE **For more information, consult the PM 400 manual or search for a local representative.**

TATU precision agriculture (APT)

The APT system was created with an electronic communication pattern that allows that products from different manufacturers communicate with one another. Thus, it is possible to control all equipments from a single terminal station.

The system will be operated from the tractor cab by a virtual terminal (VT) that can command every function.

Benefits:

• ISOBUS standard quick coupler connector for proper fitting and quick installation;

• ISOBUS communication, which allows a quick adaptation of tractor and equipments;

• Fullscreen alarms;

• Hydraulic control valves (PWM);

• Several monitoring and control systems in a single screen. More room in the cab and reduction in the amount of wires;

• Monitors up to 200 row units;

• Compatíble with level monitoring, pressure and rotation sensors;

• Keeps the information even when there is a lack of energy;

• Flat and floating rate application;

• Input reduction, productivity and profitability increasement;

Costs reduction:

• All the mechanical transmission system (clutches, clutches shafts, chain and wheelset tighteners, sprocket combinations, manual operations, seed and fertilizer tables) will be eliminated;

• Wheelset skidding that activates the transmission shafts;

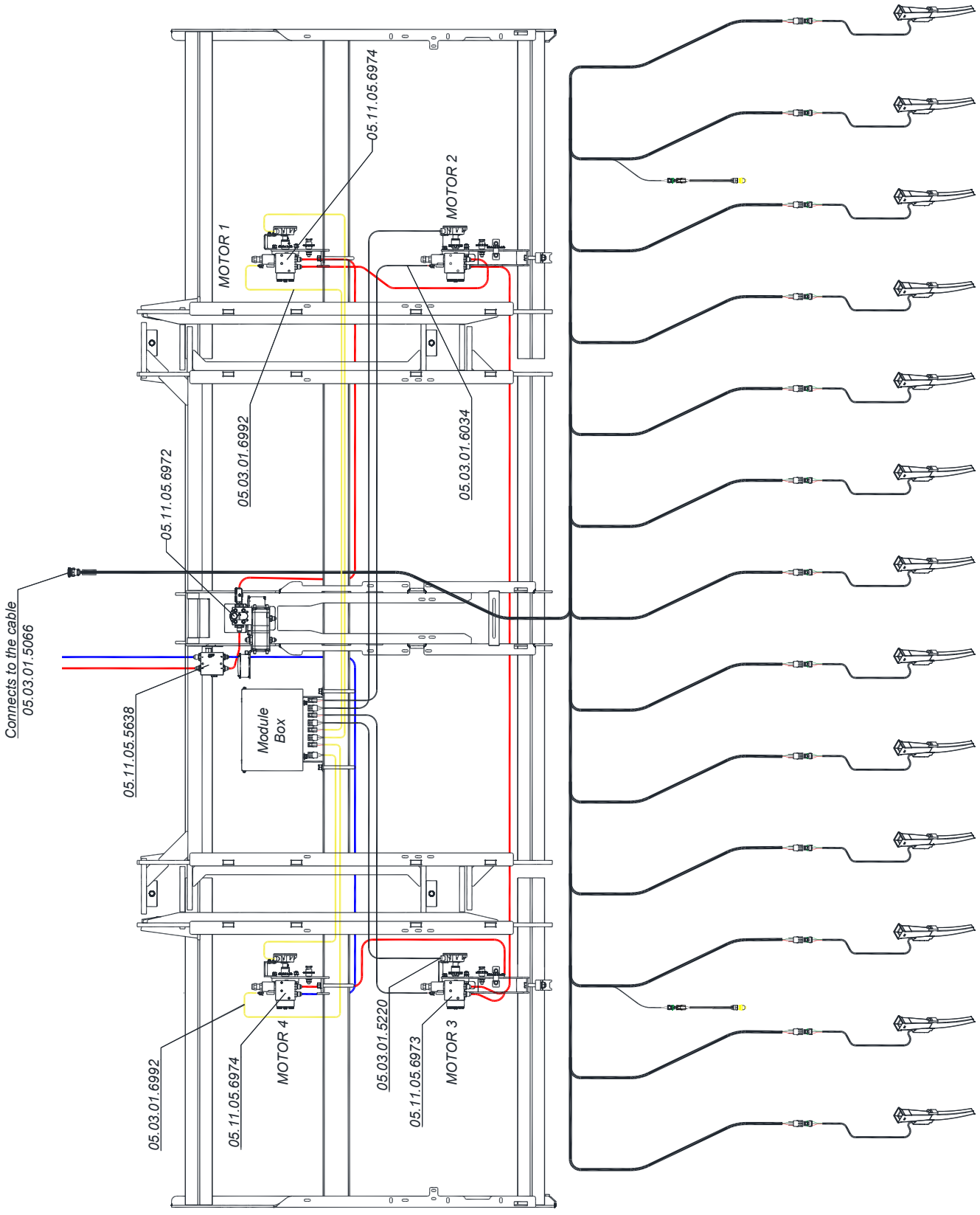
• Field tests and the subsequent adjustment fixes;

• Every planter model can receive the hydraulic / electronic system to replace the mechanical transmission.

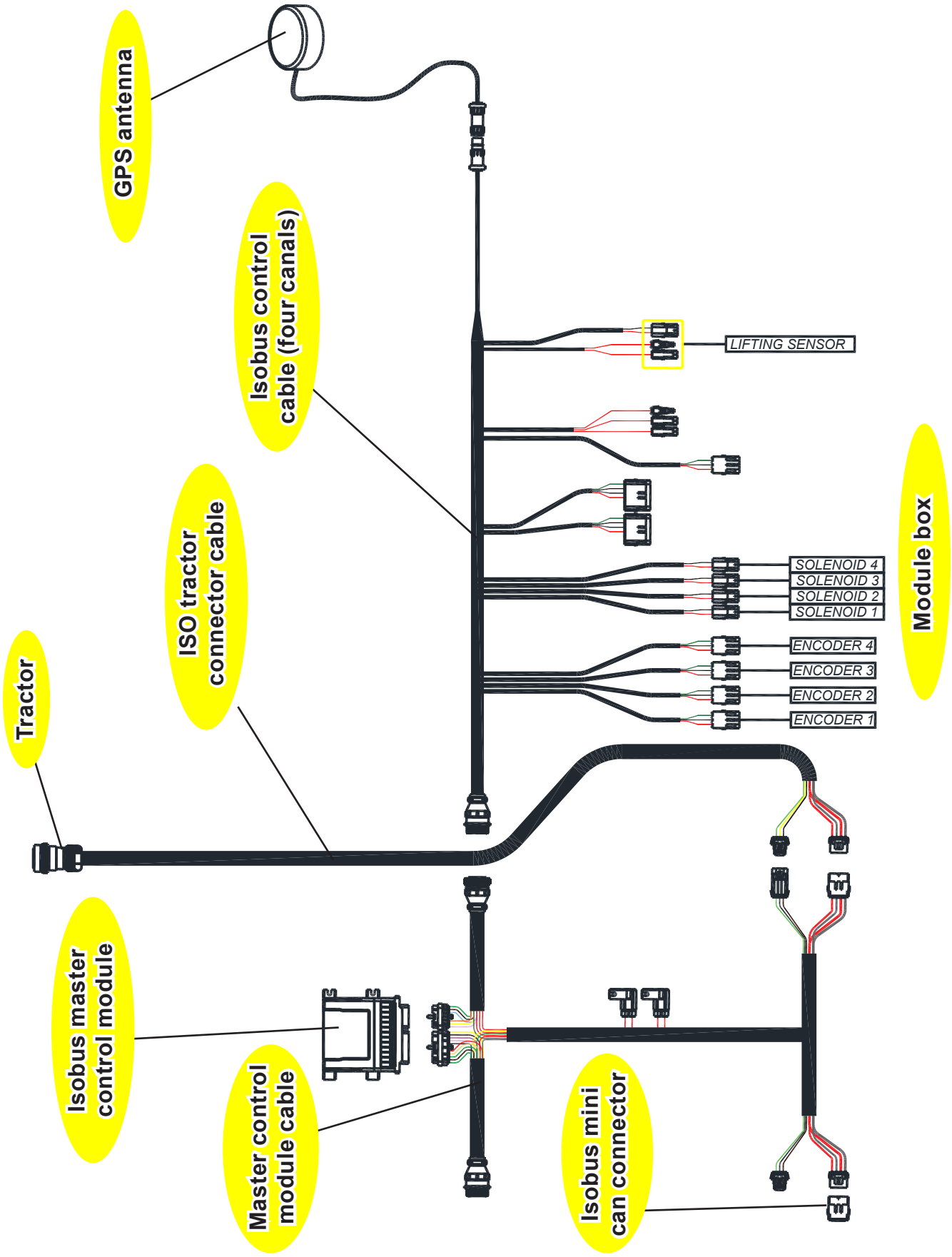
Easy maintenance:

• The color pattern of the cables and the diagnosis center in a single terminal station facilitates the discovery of possible problems.

TATU precision agriculture - Components connection



TATU precision agriculture - Module box

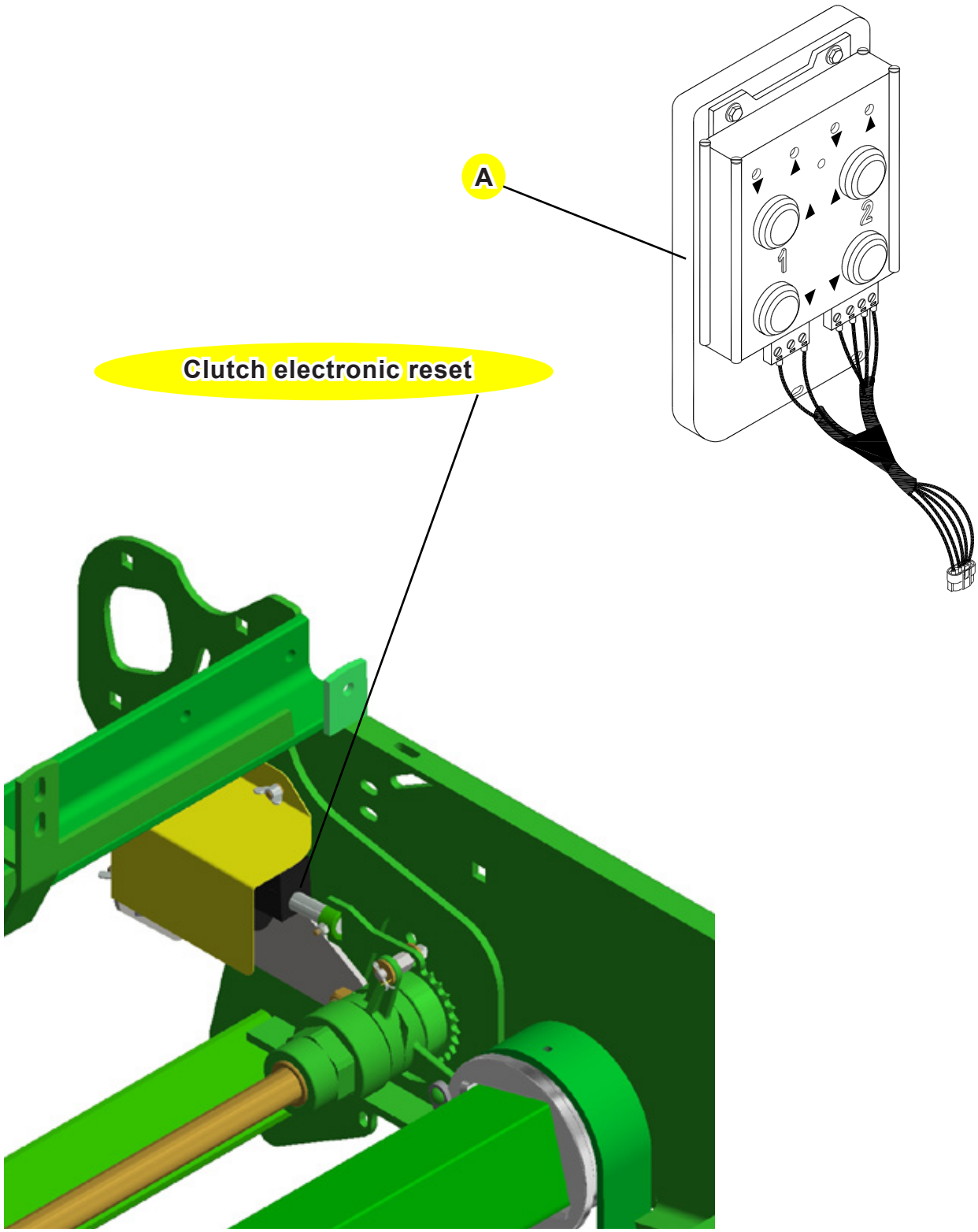


Clutch electronic reset

Marchesan optionally supplies an electronic reset for the clutch.

The command panel (A) should be installed in a place that is easy to access to the tractor conductor.

For a bigger commodity, we recommend installing the control panel (A) in the tractor cab, thus facilitating the clutch reset.



Single seed hopper

Marchesan optionally supplies a single seed hopper (A).

Lubrication

In order to reduce the wearing caused by the friction in the moving parts of the equipment, it is necessary to make a correct lubrication, as indicated below:

• Be certified about the lubricant quality, with relation to its efficiency and purity, avoiding the use of products contaminated by water, earth and others.

• Use medium consistency grease.

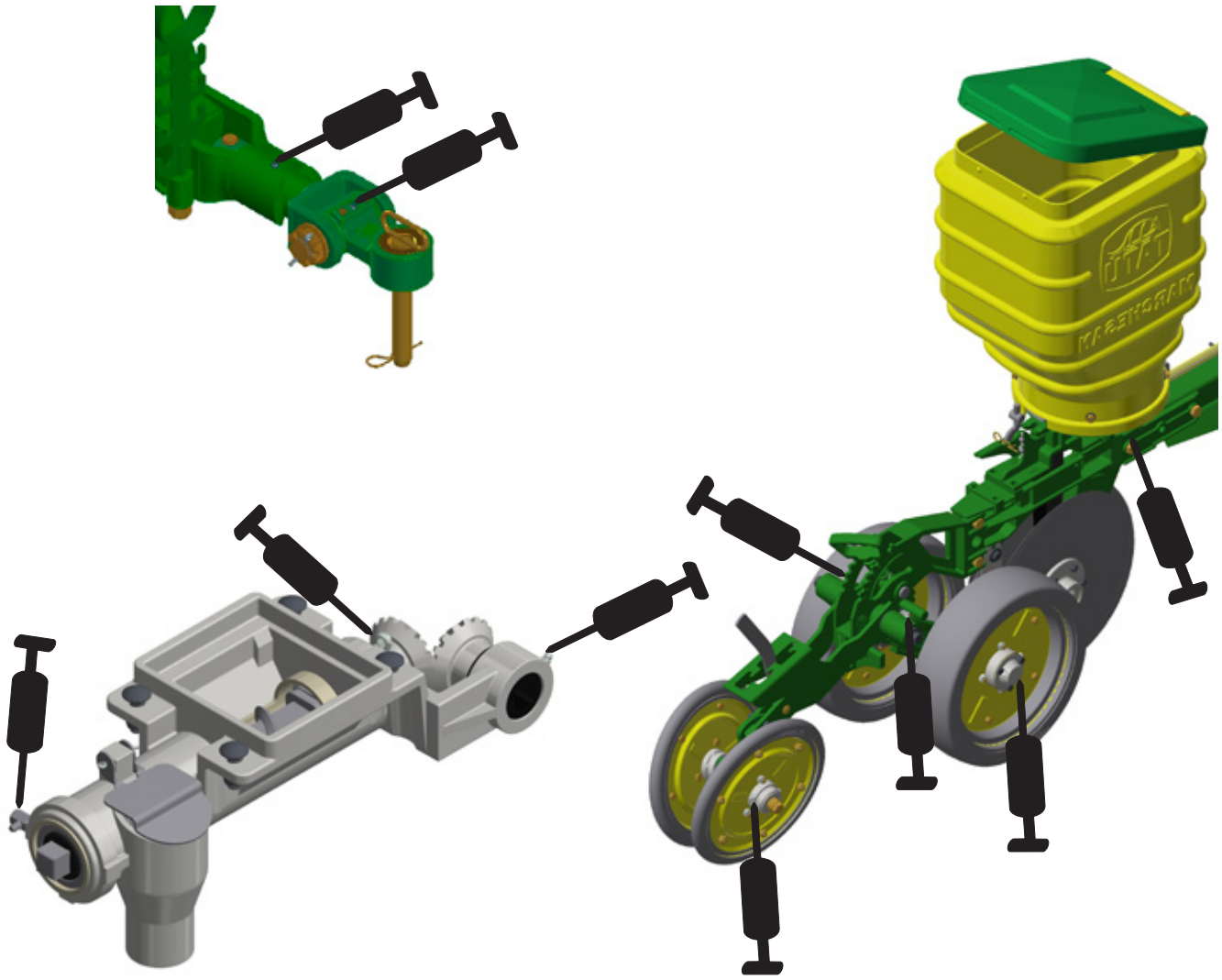
• Remove the remainder old grease around the articulations.

• Clean up all the grease fittings with a cloth before introducing the lubricant and substitute the defective ones.

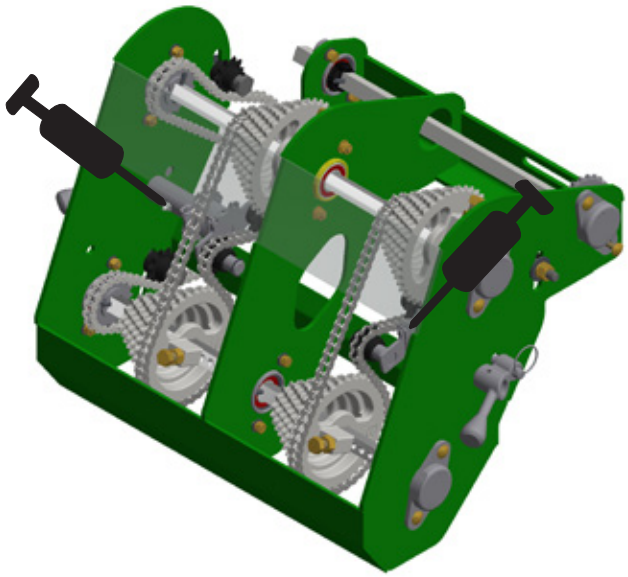
• Introduce an enough amount of new grease.

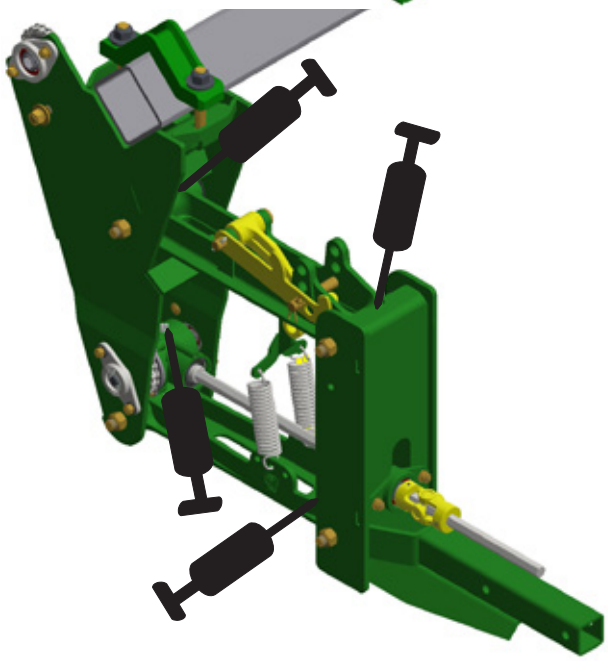
ATTENTION **Special attention should be given to the lubrication intervals on the different points of the planter.**

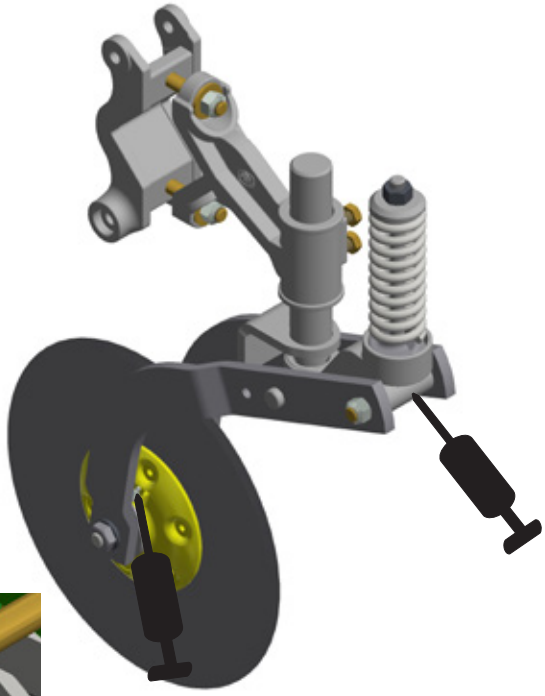
Lubricate every 10 hours of service

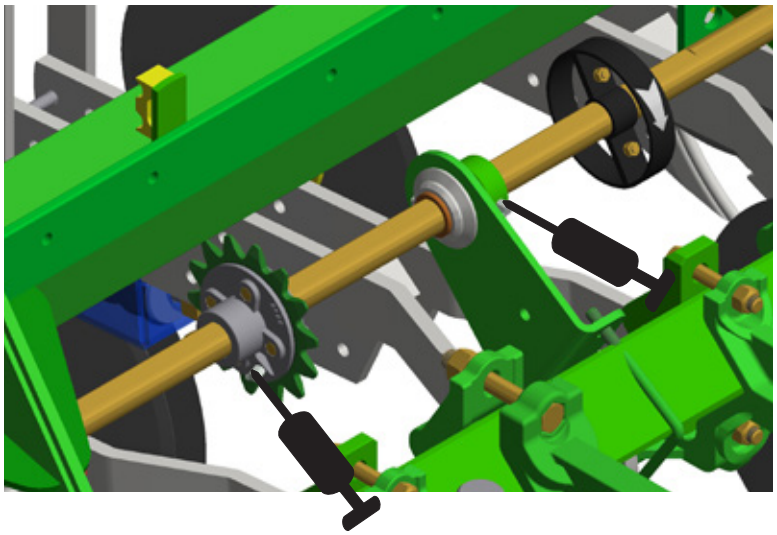


Lubricate every 10 hours of service

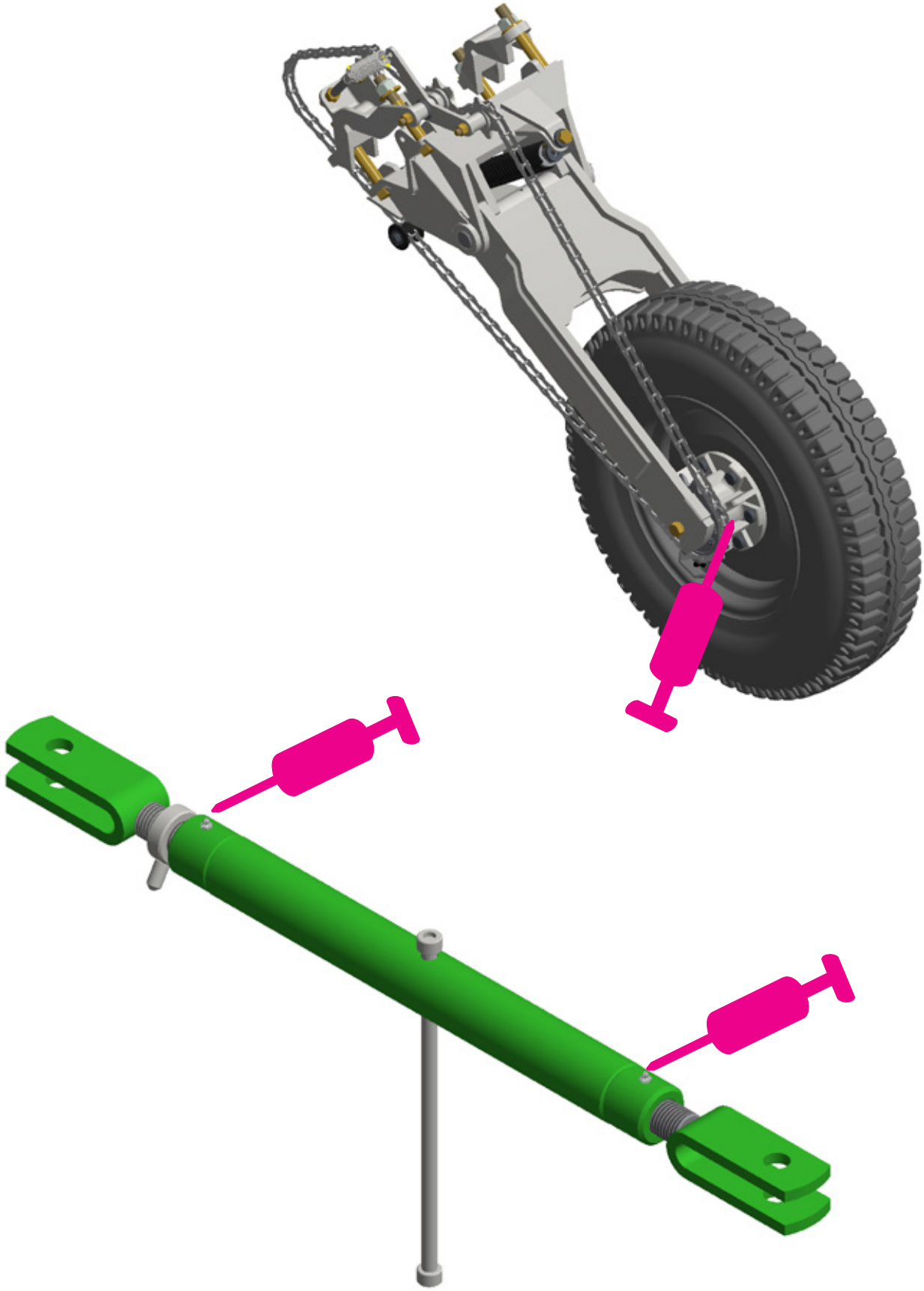








Lubricate every 50 hours of service



Fertilizer metering maintenance

For the correct fertilizer metering maintenance or to make any kind of repair in its internal part, proceed as follows:

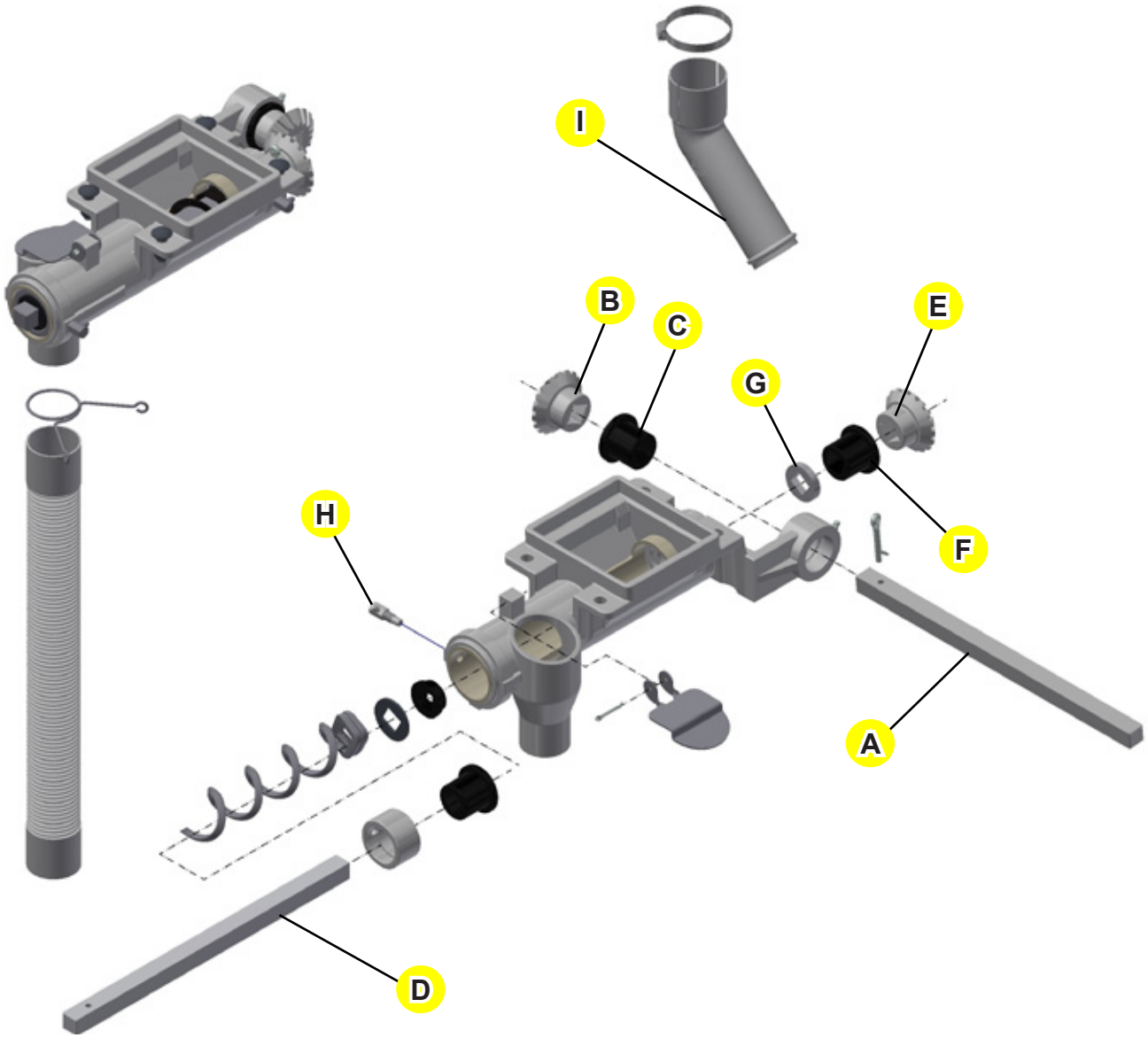
• Remove the squared shaft (A) with bevel gear (B) and the bearing (C).

• Remove the inner squared shaft (D), along with the bevel gear (E), bearing (F) and the fixation nut (G) by the frontal part of the metering.

• Remove the grease fitting (H) from the rear part of the metering to release the other parts as shown in the illustration and replace the defective ones.

• Assemble the metering system again observing the correct position of the right and left augers.

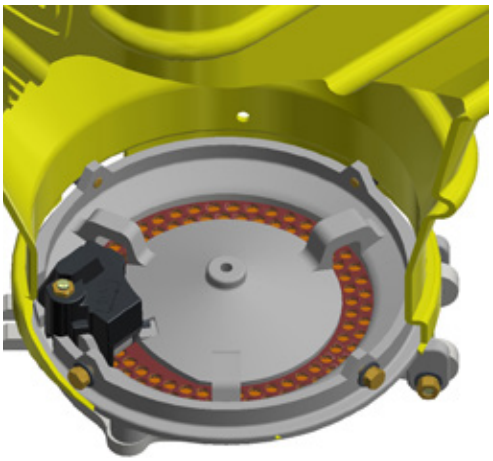
• Do not forget to lubricate the metering grease fittings daily as mentioned on the 'lubrication' page, avoiding future problems.



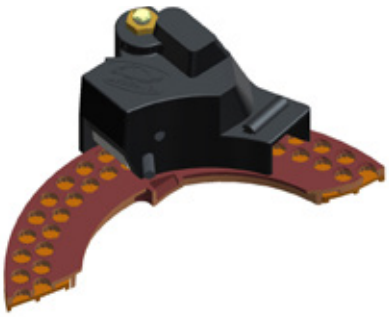
NOTE **To improve the fertilizer dropping, use the fertilizer tube (I) when necessary.**

Cleaning the seed metering

It is necessary to make a general cleaning in each seed metering daily. To do this, remove the seed plate and observe the metering mechanism operation. By doing so, the best planting will be assured.



NOTE **When using graphite powder with treated / inoculated seeds, it is necessary to clean the system twice a day.**



Maintenance of the row hubs

• When the existence of looseness is noticed, it is necessary to make the maintenance in the hubs of the coulter blades, unaligned double discs, gauge wheels and press wheels.

• Disassemble the hubs and remove the internal components.

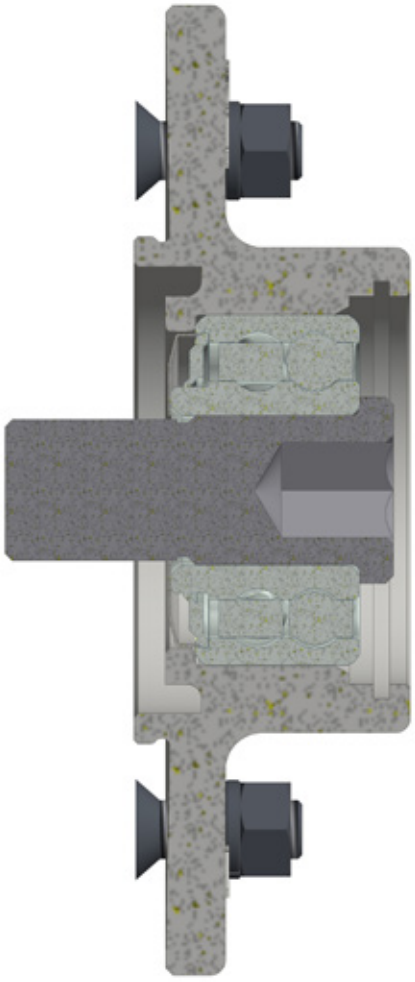
• Clean all parts with diesel oil.

• Verify the existence of looseness and the conditions of bearings, retainers and bushings. Replace the damaged components or with excessive wearing.

• The hubs without grease fittings should be reassembled with a good amount of lubricant.

• The hubs with grease fittings should be lubricated until the new grease is visible.

• The hubs with tapered roller bearings fastened by castle nut and cotter pin allow the adjustment of the inner clearance; excessive tightening should be avoided. The hubs should rotate with the hand applying a small effort.



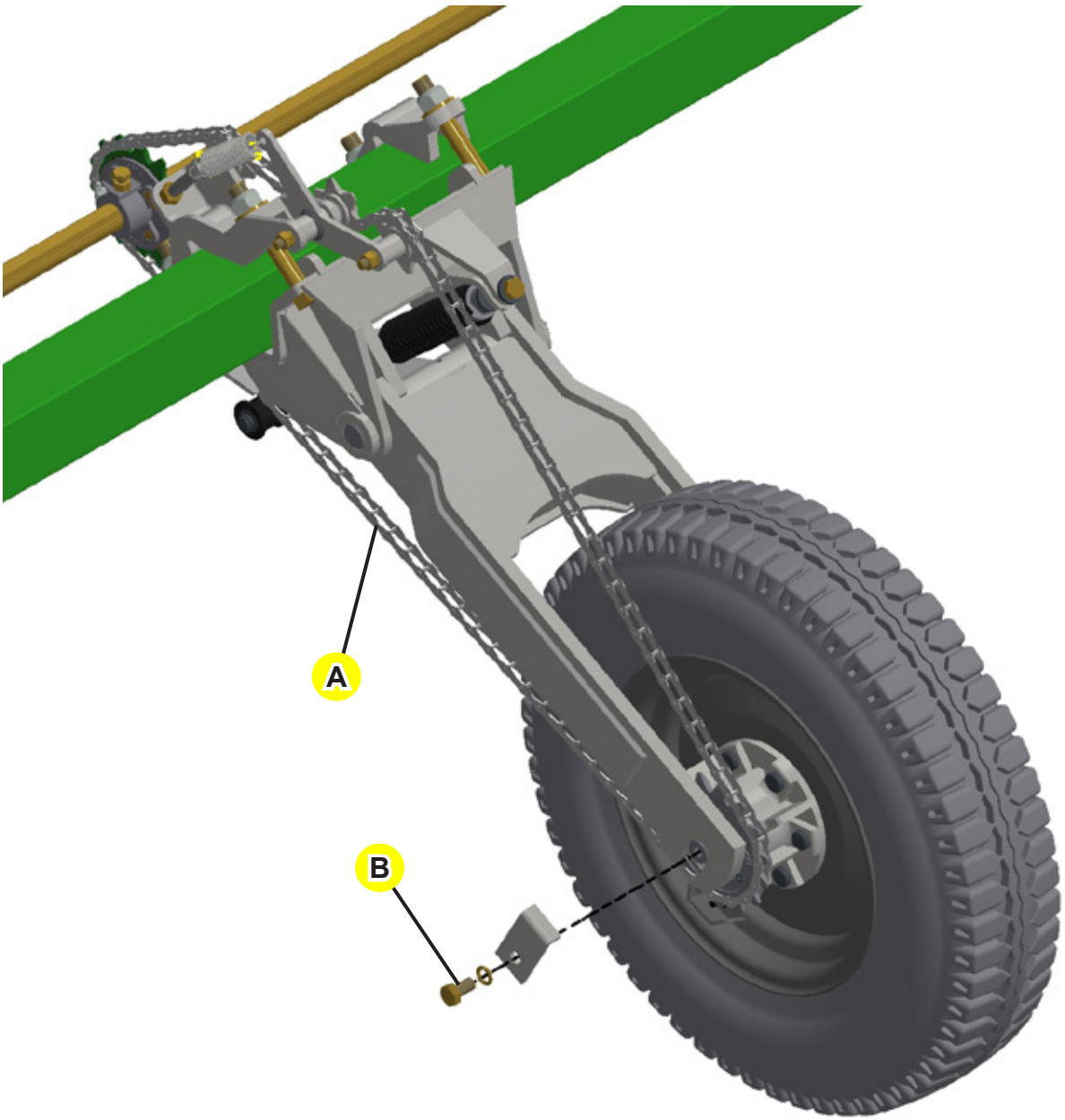
How to replace the tires

When the planter tires need repairs, proceed as follows:

• Support the equipment in the rear angle bracket using the stanchions and parking stands.

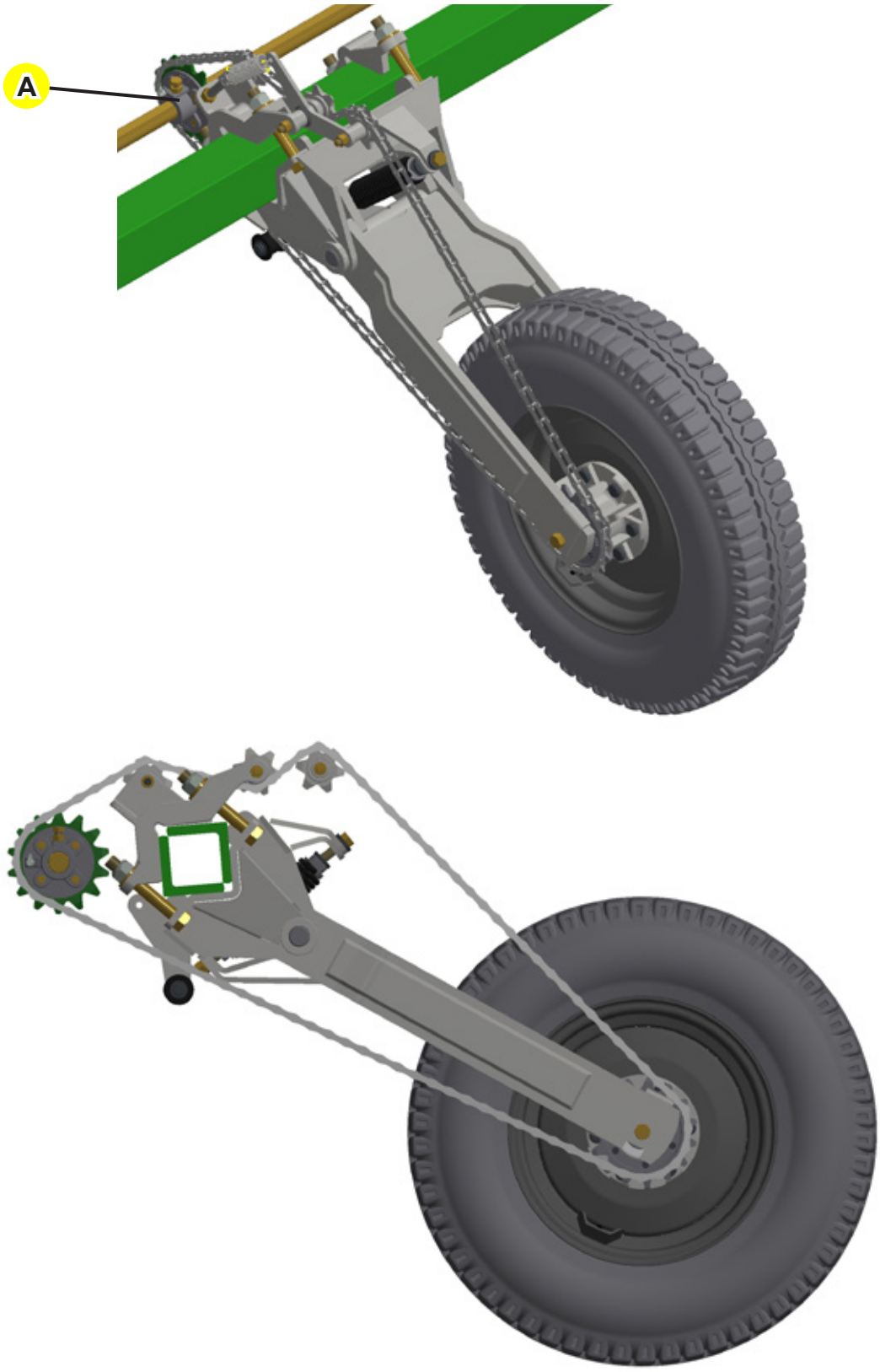
• Totally retreat the hydraulic cylinder to lift the tire from the soil.

• It is not necessary to release all the clutch set; just remove the chain (A), bolt (B) and lock.



Check if the planter is properly supported in order to avoid accidents.

• Carefully observe the correct position of the chain and wheelset tightener.

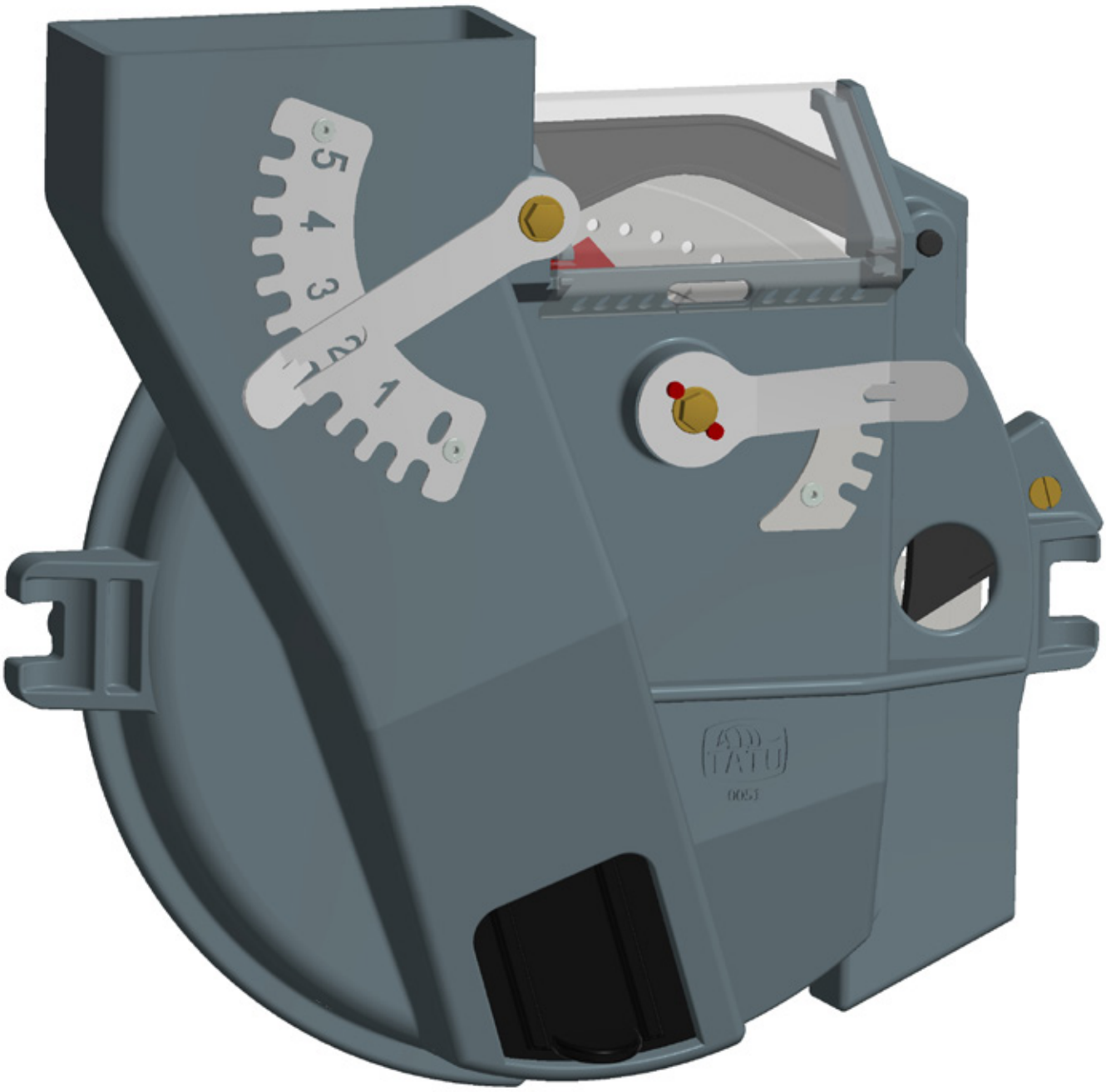


NOTE **If it is necessary to remove the free turn transmission activation (A), observe its proper assembly in the correct position according to the illustration.**

Planter maintenance

- Remove the fertilizer hoses and wash them immediately just with water and neutral soap.
- Wash the whole planter using only water.
- Wash carefully the fertilizer augers in order to remove adherences.
- Verify all the moving parts of the planter for wearing occurence. If necessary, replace some parts and leave the planter ready for the next planting season.
- Repair the paint failure.
- Spray the metallic parts with protective oil. Never spray used engine lubricant oil.
- The driving mechanism chains should be removed at the end of the planting season, cleaned and stored in a recipient with oil until the next planting season.
- Clean and lubricate all grease fittings.
- Replace the missing or damaged safety stickers. Marchesan provides these stickers upon request and indication of the respective serial number. The operator must know the need to keep these stickers in place and in good conditions. Also, the operator must be aware that an accident can occur if the instructions are not followed.
- After making all the repairs and maintenance cares, store the planter in an appropriate place (dry and covered).
- Remove the extensor, articulate the drawbar upwards and lock it.
- Keep the planter properly supported and avoid the direct contact of the discs and tires with the soil.

NOTE **Use TATU original parts only.**



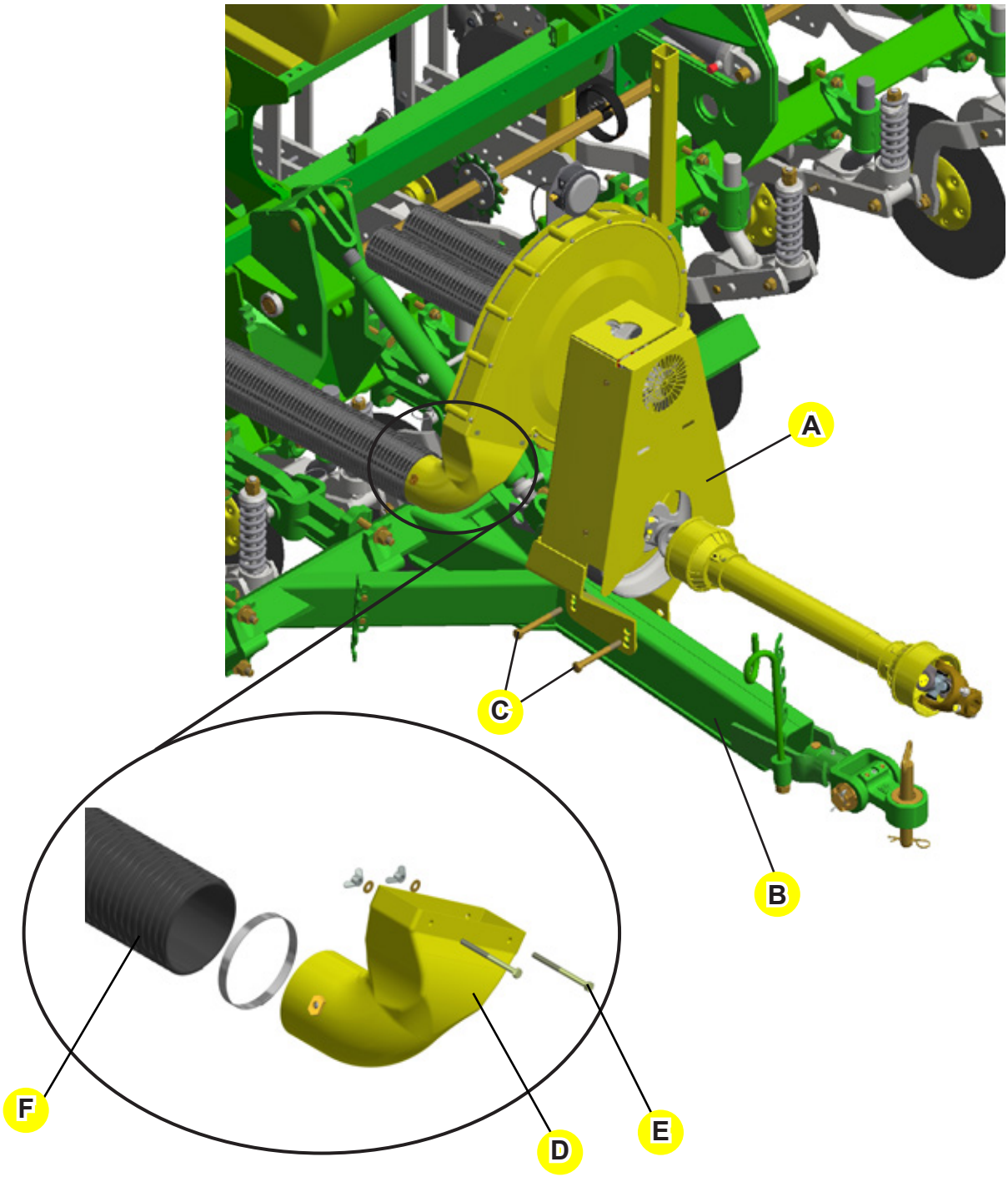
Vacuum seed metering

Assembly of the air ducts and blower with cardan shaft

• Assemble the blower (A) with cardan shaft to the drawbar (B), locking it with bolts (C), spring washers and nuts.

• Then, assemble the air outlet tube of the adjusting valve (D) using bolts (E), spring washer and wing nut.

• After that, couple the conductor hose (F) using the clamp, passing it over the wheelset shaft and going to the equipment rear.

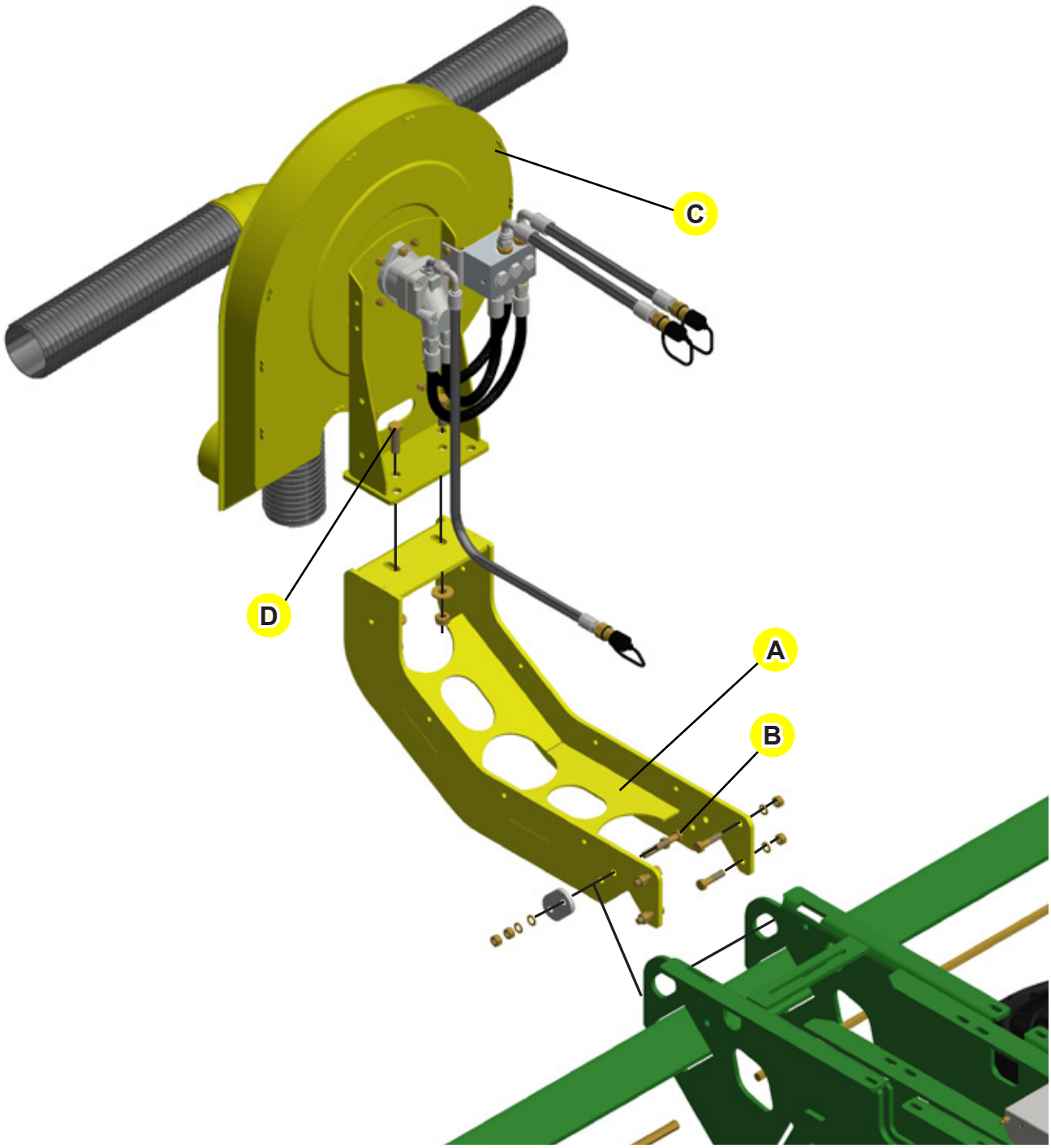


Carefully read the instructions found in the blower.

Hydraulic blower assembly

• Assemble the blower rear support (A) to the rear part of the frame, locking it with bolts (B), flat washer, blower support fastener, spring washer and nut.

• Then, assemble the blower (C) to the blower rear support (A), locking it with bolts (D), spring washer and nuts.

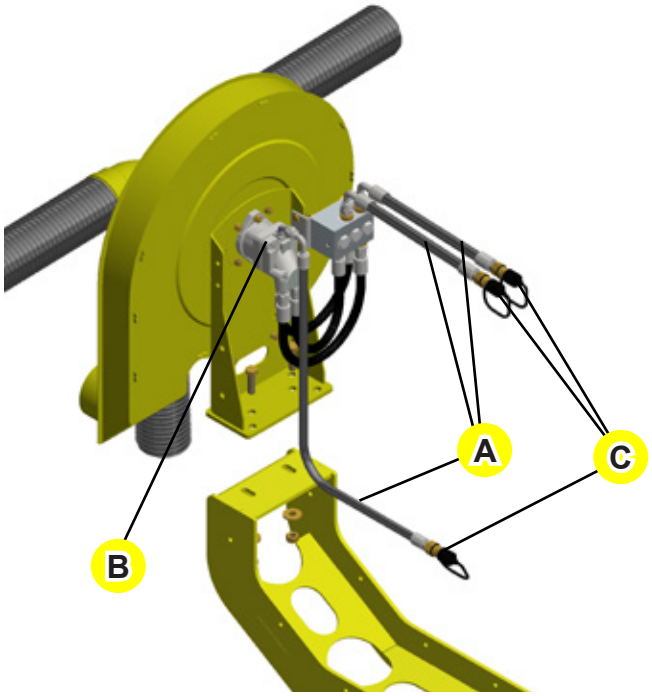


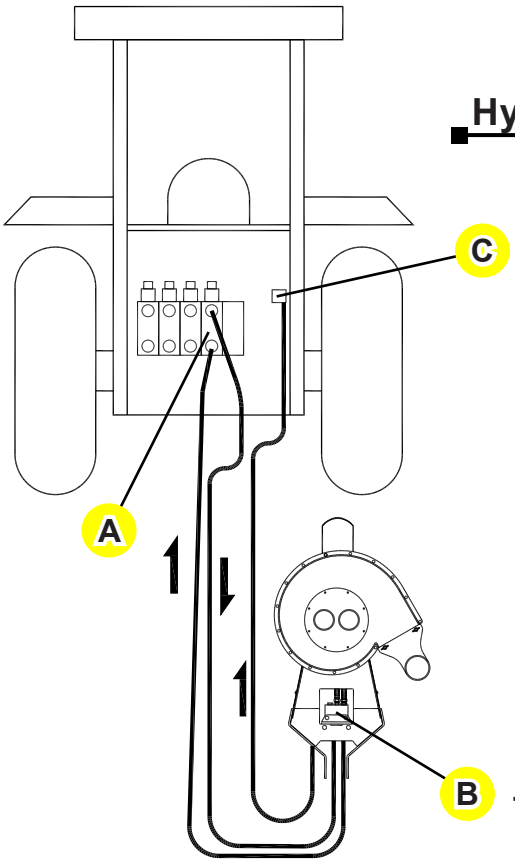
Blower with hydraulic motor

• Fasten the hoses (A) to the hydraulic motor (B). Observe if the terminals are clean and avoid that they touch the soil.

• Couple the male quick couplers (C) to the hoses, with proper tightening to avoid leaks.

NOTE **Use thread sealing tape to couple the hoses to the male quick couplers.**





Hydraulic activation

Tractors with hydraulic system. Priority control valve with variable flow.

This valve has the hydraulic system and tractor priority and works when the equipment is lifted or when the tractor steering wheel is used and avoids a slower rotation in the blower.

A - Priority valve with variable flow.

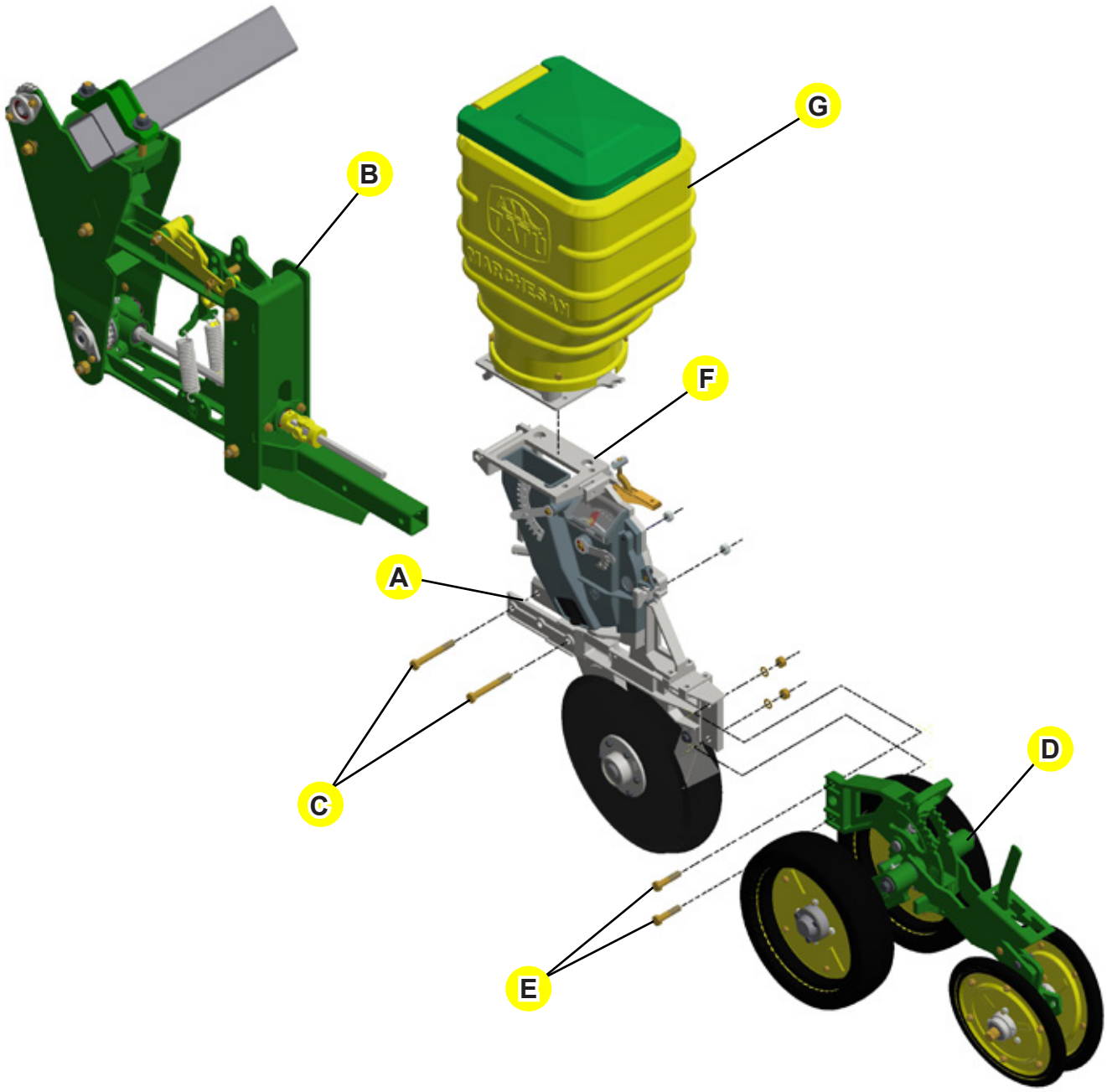
B - Blower with hydraulic motor.

C - Free return to the reservoir, which should not have pressure in order to not damage the motor.

NOTE **For tractors which not have a direct free return (C) to the reservoir, it is necessary to consult the resale to make the adaption.**

Assembly of the row unit (rear part)

Fasten the row (A) to the parallelogram (B) using bolts (C), spring washer and nuts. Then, lock the rear part of the row (D) using bolts (E), spring washers and nuts. Lastly, fasten the vacuum seed meter (F) and the seed hopper (G).

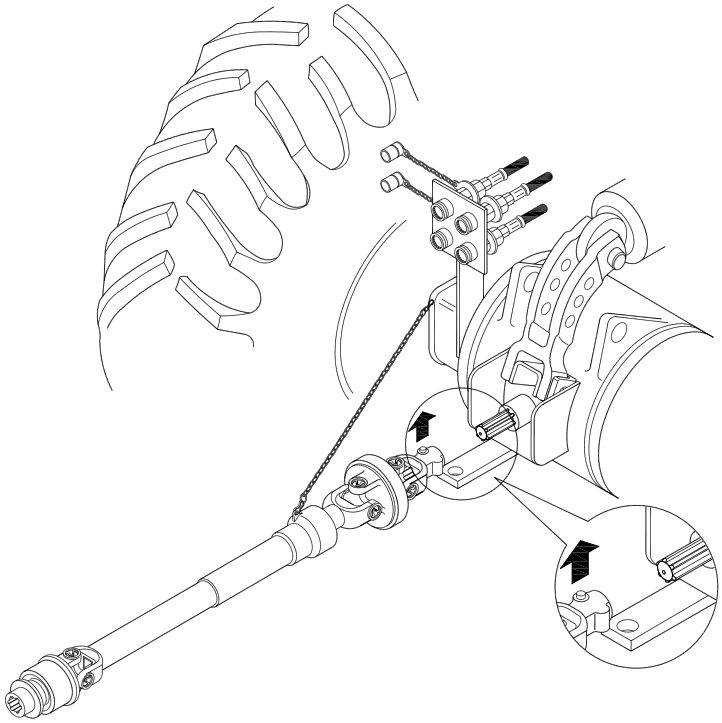


Blower activation

With telescopic cardan and constant-velocity joint.

• In this case, it is recommended to use a tractor with double clutch.

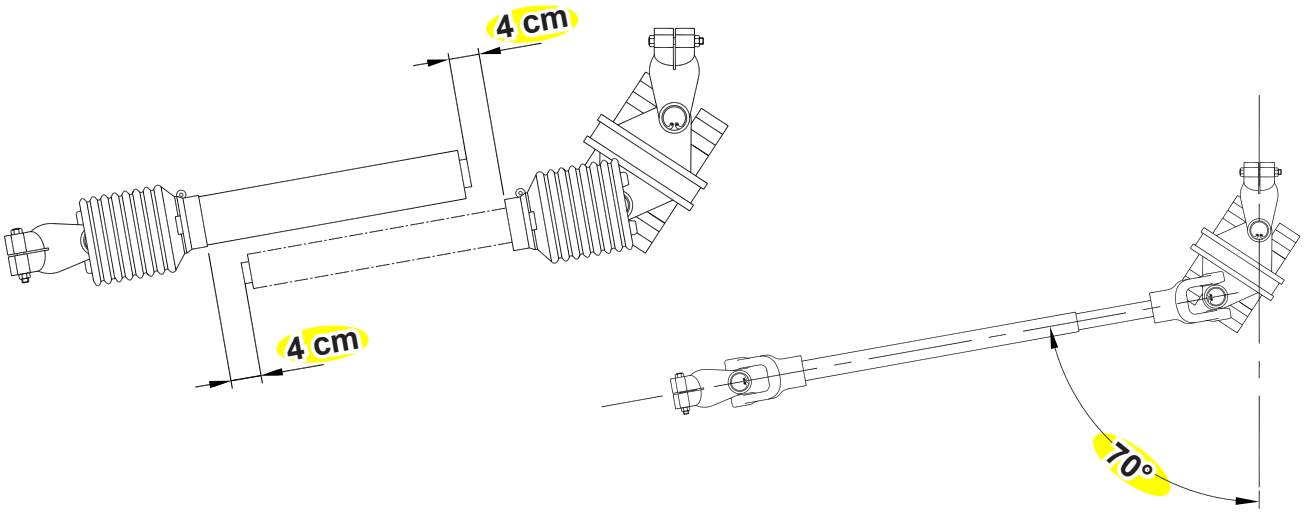
• Verify the length of the cardan shaft in the following way:



1) Separate the male bar from the female tube and couple it in the power take-off. For this, check the coupling lock device to the PTO shaft.

2) Steer the tractor wheel until it gets closer to the drawbar (approximately a 70 degree angle). With the cardan shaft bars placed side by side, verify the existence of a minimum free space of four centimeters, according to the illustration below.

3) The PTO can work only when the tractor is going forward. When backing up, the PTO should be turned off.



NOTE

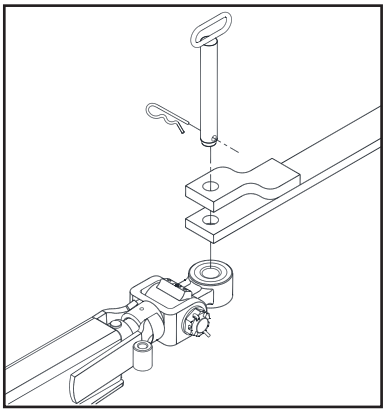
At this time, the adjustment range of the tractor drawbar can be used for shortening it or lengthening it.

Maneuvers in reverse gear are not allowed when the homocinetic cardan is stopped. This practice is extremely harmful to the terminals and universal joints.

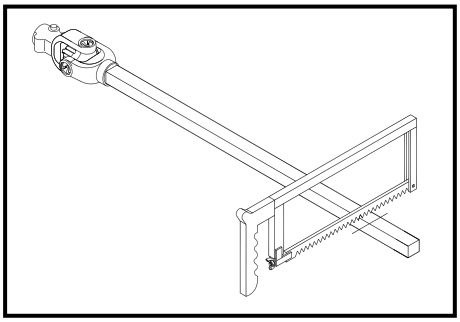
If it is necessary to perform a maneuver, make it while the homocinetic cardan is moving.

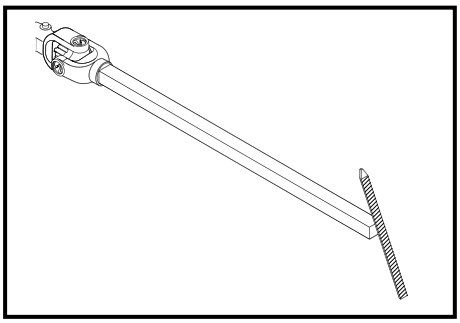
Reducing the cardan shaft length

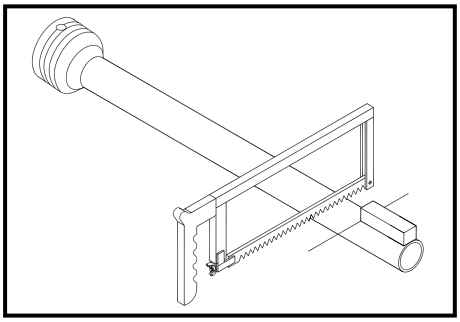
If it is necessary, cut similar parts of the male and female drive shaft as well as the protecting covers. But before cutting the shaft, verify all possibilities of usage without reducing its length. Check if the drawbar can be adjusted.



The length adjustment will be done when the distance between the equipment and the tractor do not allow coupling. Proceed as follows:







• First of all, disassemble the protecting covers.

• Cut the hub and the solid bar (male and female) in the desired measures. In order to do so, couple half of the cardan in the tractor and half in the equipment, placing the semi-cardans in parallel and in several operating positions. Then, determine the correct length and mark the cutting area.

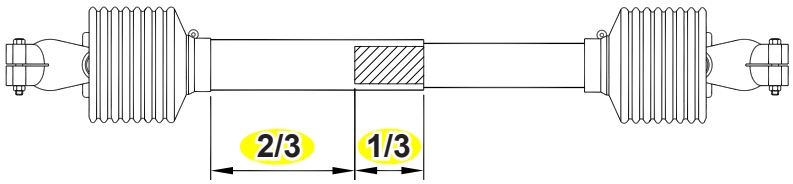
• It is important to give finish working in the cut parts. For this purpose, use a filer. Soon after, remove the filing and lubricate the 'male' with a fine layer of grease.

• Decrease the length of both protective covers, using the cut tubes as a measure and clean the cut residues.

• After that, assemble the cardan according to the assembly instructions on the following page.

• When using another tractor to work with the planter, verify the length of the cardan shaft again.

• The chains of the protective covers should be fastened in the planter and in the tractor, so that they will not get loose during maneuvers.

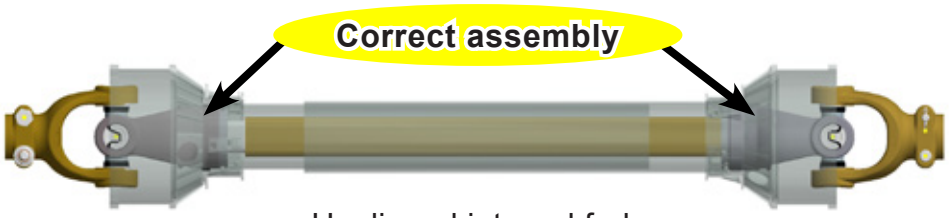


NOTE **The contact surface between the hub and the bar shall not be smaller than 1/3 of the total length.**

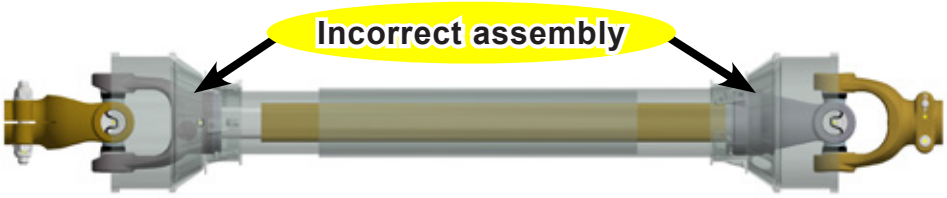
Cardan shaft assembly

When assembling the cardan shaft, it is necessary to be careful and leave the terminals on both ends aligned. The discrepancy of the terminals in 90° will cause vibrations and a greater wear on the universal joints, reducing the lifetime of the set.

Observe the internal forks alignment:

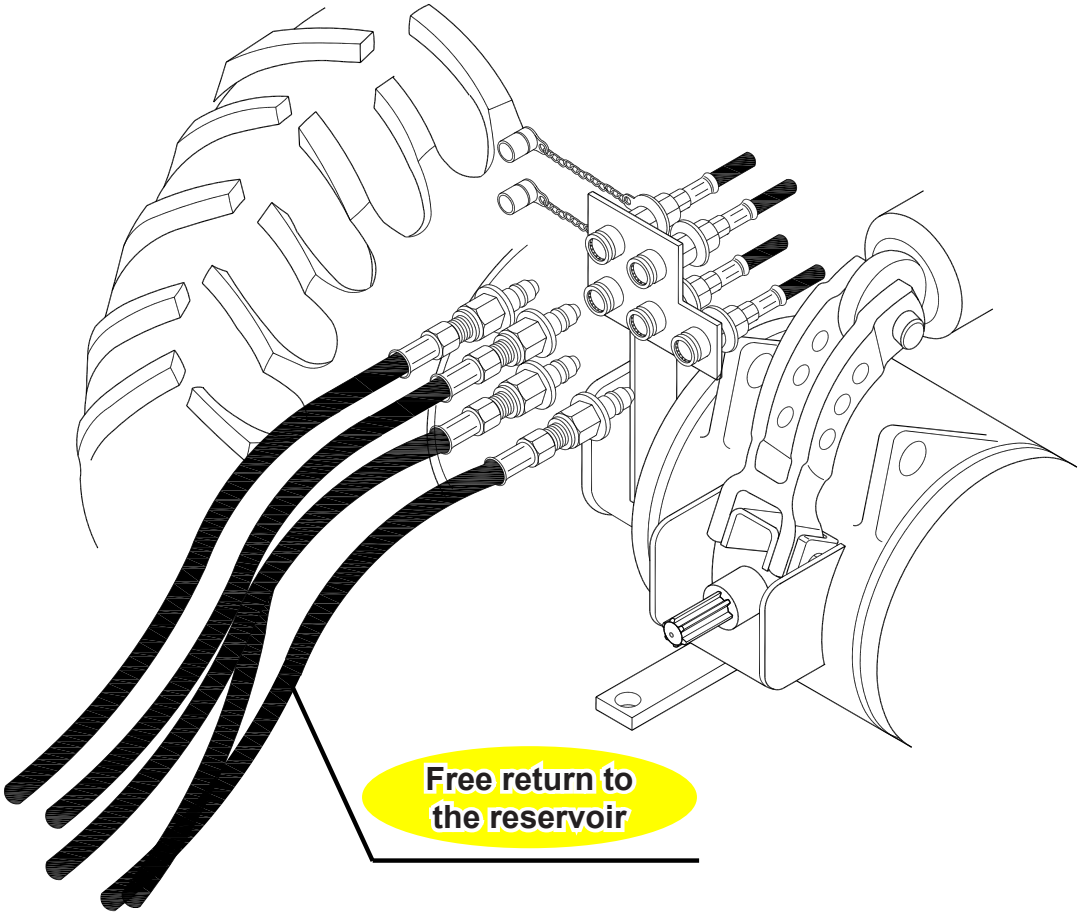


Unaligned internal forks:



Hydraulic motor blower activation

Couple the hydraulic motor and cylinder hoses to their respective hydraulic outputs in the tractor.



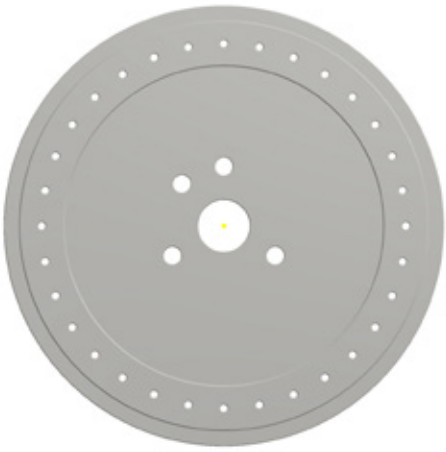
Standard seed plates - Ultra Flex Suprema

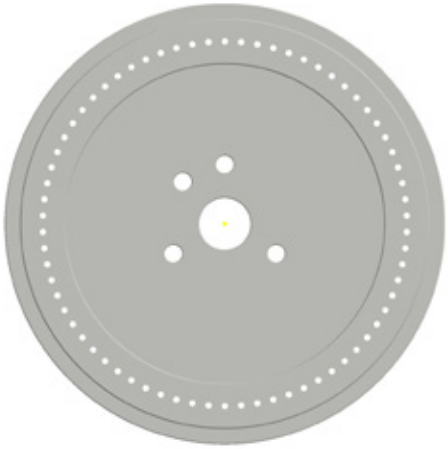
Seed plates	Amount of holes	Hole diameter
CORN	32 holes	Ø 4,5 mm
SOYBEAN	70 holes	Ø 4,0 mm

Optional seed plates - Ultra Flex Suprema

MARCHESAN optionally supplies these seed plates for several crops, according to the list below:

Seed plates	Amount of holes	Hole diameter
CORN	32 holes	Ø 4,0 mm
PEANUT	40 holes	Ø 7,0 mm
SORGHUM	50 holes	Ø 2,0 mm





Seeds distribution

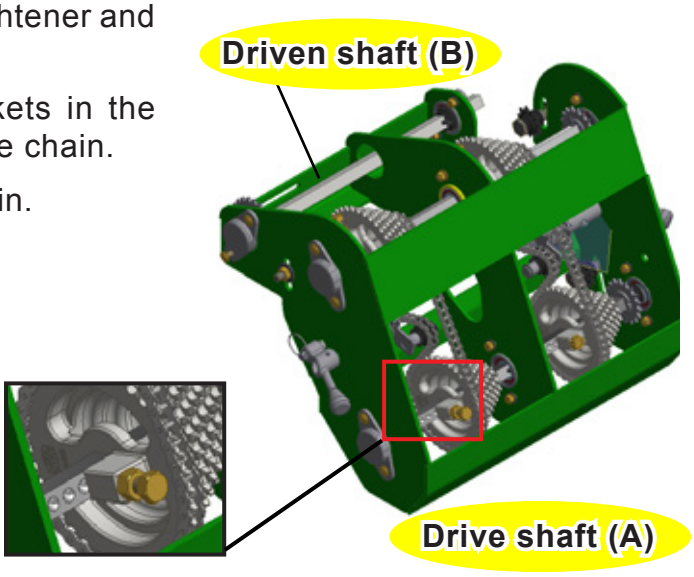
Adjust the seed rate per linear meter through the sprocket combinations of the Drive Shaft **{A}** (14, 18, 22, 26, 30, 34 and 38 teeth) and Driven Shaft **{B}** (14,18, 22, 26, 30, 34 and 38 teeth).

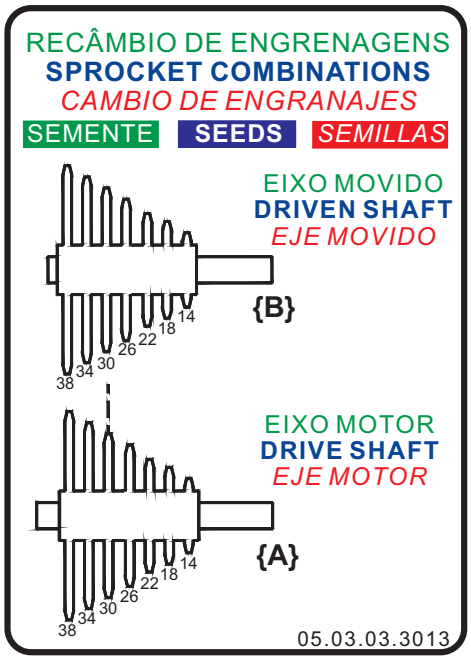
Procedures to change the sprocket

• Move the lever to relieve the chain tightener and lock it using a pin.

• Manually displace the set of sprockets in the shaft and align the chosen sprocket with the chain.

• Release the lever to loose the lock pin.





NOTE

The cone bolts on the sprockets handling "TRA" are pre-adjusted on the factory, allowing to change the sprockets without using any tool. In case of any sliding motion on the cone shaft, just release the counter nut and turn around the bolt to re-lock.

In order to avoid damage to the spring and shafts, never apply excessive torque when tightening.

IMPORTANT

The following pages show the different amounts of seeds distributed to many crops, according to the sprocket combinations.

The correct seed plate matching to the used seeds is very important.

Never combine seeds of different sizes.

The seed and fertilizer distribution tables in this manual must be used as a reference to start the planter adjustment. Factors such as the slippage index of the planter wheels (skidding), working speed, tire inflation, field conditions, seed type and others can make the values differ from the ones in the table. Therefore, it is always indispensable to make the practical distribution tests, as indicated on page 50.

Seed distribution table 05.03.03.2996

TABELA DE DISTRIBUIÇÃO DE SEMENTES
TABLE FOR DISTRIBUTION OF SEEDS
TABLA DE DISTRIBUCIÓN DE SEMILLAS

Número de Furos / **Number of Holes** / *Número de Agujeros*		12	16	20	24	32	48	58	64	75	84
Engrenagens / **Sprockets** / *Engranajes*											
Eixo Motor **Drive Shaft** *Eje Motor*	Eixo Movido **Driven Shaft** *Eje Movido*	Sementes em 1 Metro Linear / **Seeds in 1 Linear Meter** / *Semillas en 1 Metro Lineal*									
14	**38**	0,87	1,17	1,46	1,75	2,33	3,50	4,23	4,66	5,46	6,12
14	**34**	0,98	1,30	1,63	1,95	2,61	3,91	4,72	5,21	6,11	6,84
14	**30**	1,11	1,48	1,85	2,22	2,95	4,43	5,35	5,91	6,92	7,75
18	**38**	1,12	1,50	1,87	2,25	3,00	4,50	5,43	6,00	7,03	7,87
18	**34**	1,26	1,68	2,09	2,51	3,35	5,03	6,07	6,70	7,85	8,79
14	**26**	1,28	1,70	2,13	2,56	3,41	5,11	6,18	6,82	7,99	8,94
22	**38**	1,37	1,83	2,29	2,75	3,66	5,50	6,64	7,33	8,59	9,62
18	**30**	1,42	1,90	2,37	2,85	3,80	5,70	6,88	7,59	8,90	9,97
14	**22**	1,51	2,01	2,52	3,02	4,03	6,04	7,30	8,06	9,44	10,57
22	**34**	1,54	2,05	2,56	3,07	4,10	6,14	7,42	8,19	9,60	10,75
26	**38**	1,62	2,17	2,71	3,25	4,33	6,50	7,85	8,66	10,15	11,36
18	**26**	1,64	2,19	2,74	3,29	4,38	6,57	7,94	8,76	10,27	11,50
22	**30**	1,74	2,32	2,90	3,48	4,64	6,96	8,41	9,28	10,88	12,18
26	**34**	1,81	2,42	3,02	3,63	4,84	7,26	8,77	9,68	11,34	12,70
14	**18**	1,85	2,46	3,08	3,69	4,92	7,38	8,92	9,85	11,54	12,92
30	**38**	1,87	2,50	3,12	3,75	5,00	7,49	9,06	9,99	11,71	13,11
18	**22**	1,94	2,59	3,24	3,88	5,18	7,77	9,39	10,36	12,14	13,59
22	**26**	2,01	2,68	3,35	4,02	5,36	8,03	9,71	10,71	12,55	14,05
26	**30**	2,06	2,74	3,43	4,11	5,49	8,23	9,94	10,97	12,86	14,40
30	**34**	2,09	2,79	3,49	4,19	5,58	8,38	10,12	11,17	13,09	14,66
34	**38**	2,12	2,83	3,54	4,25	5,66	8,49	10,26	11,33	13,27	14,86
22	**22**	2,37	3,16	3,96	4,75	6,33	9,49	11,47	12,66	14,83	16,61
38	**34**	2,65	3,54	4,42	5,31	7,07	10,61	12,82	14,15	16,58	18,56
34	**30**	2,69	3,59	4,48	5,38	7,17	10,76	13,00	14,35	16,81	18,82
30	**26**	2,74	3,65	4,56	5,48	7,30	10,95	13,24	14,61	17,12	19,17
26	**22**	2,80	3,74	4,67	5,61	7,48	11,22	13,56	14,96	17,53	19,63
22	**18**	2,90	3,87	4,83	5,80	7,74	11,60	14,02	15,47	18,13	20,30
38	**30**	3,01	4,01	5,01	6,01	8,02	12,03	14,53	16,03	18,79	21,04
18	**14**	3,05	4,07	5,09	6,10	8,14	12,21	14,75	16,27	19,07	21,36
34	**26**	3,10	4,14	5,17	6,21	8,28	12,41	15,00	16,55	19,40	21,72
30	**22**	3,24	4,32	5,39	6,47	8,63	12,95	15,64	17,26	20,23	22,65
26	**18**	3,43	4,57	5,71	6,86	9,14	13,71	16,57	18,28	21,43	23,99
38	**26**	3,47	4,63	5,78	6,94	9,25	13,88	16,77	18,50	21,68	24,28
34	**22**	3,67	4,89	6,11	7,34	9,78	14,67	17,73	19,56	22,92	25,67
22	**14**	3,73	4,97	6,22	7,46	9,95	14,92	18,03	19,89	23,31	26,10
30	**18**	3,96	5,27	6,59	7,91	10,55	15,82	19,12	21,10	24,72	27,68
38	**22**	4,10	5,47	6,83	8,20	10,93	16,40	19,81	21,86	25,62	28,69
26	**14**	4,41	5,88	7,35	8,82	11,75	17,63	21,30	23,51	27,55	30,85
34	**18**	4,48	5,98	7,47	8,97	11,95	17,93	21,67	23,91	28,02	31,37
38	**18**	5,01	6,68	8,35	10,02	13,36	20,04	24,22	26,72	31,32	35,07
30	**14**	5,09	6,78	8,48	10,17	13,56	20,34	24,58	27,12	31,79	35,59
34	**14**	5,76	7,69	9,61	11,53	15,37	23,06	27,86	30,74	36,02	40,34
38	**14**	6,44	8,59	10,74	12,88	17,18	25,77	31,14	34,36	40,26	45,08

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Calculation of seeds/meter according to the different number of holes in the seed plates

When using a seed plate that has a number of holes that is not included in the table, it is possible to find the amount of seeds/meter it will distribute by doing the calculation below:

In the table from the previous page, for a seed plate that has **12** holes (**26 x 38** combination), the amount of seeds per meter equals **1.62**.

Example:

Using the same transmission combination **(26 x 38)** but now using a seed plate with **80 holes**, use the calculation below.

Formula:

Multiply the amount of seed per meter (table = **1.62**) by the amount of holes (new seed plate = **80**) and divide by the amount of holes (seed plate on the table = **12**).

Calculation:

$$\frac{1.62 \times 80}{12} = \frac{129.6}{12} = \mathbf{10.8}$$ seeds per linear meter.

Answer:

Using a seed plate with 80 holes, 10.8 seeds per linear meter will be distributed (26x38 combination).

IMPORTANT

- **Seed plates with larger diameter holes should be used for larger seeds.**
- **Use dry seeds only.**
- **Constant working speed of the planter:**

  Corn / Sunflower = 5 to 6 km/h;

  Bean / Sorghum / Delinted cotton = 6 km/h;

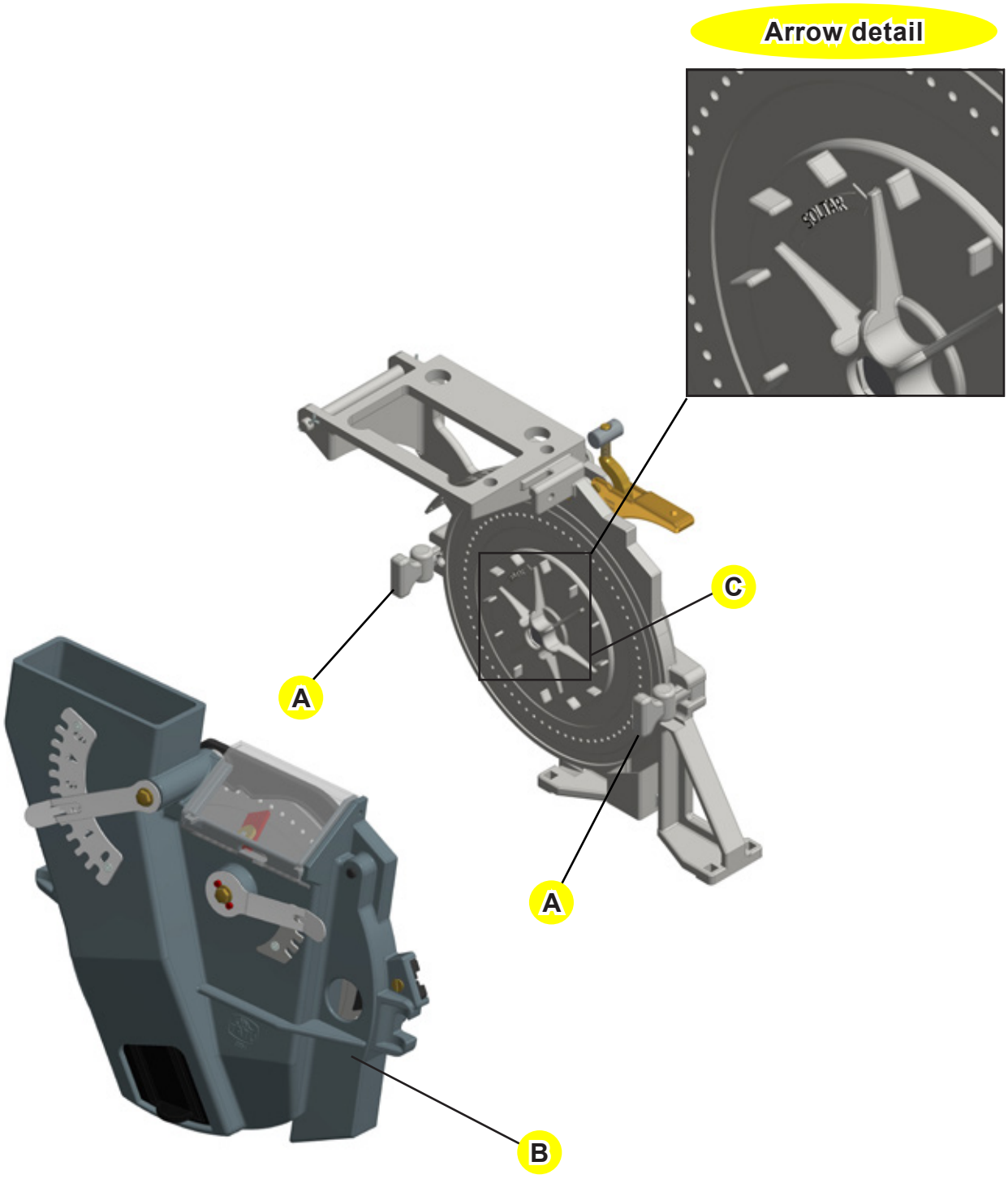
  Soybean = 7 km/h.

Changing the seed plates

To change the seed plates, proceed as follows:

• Pull the lid fasteners (A), removing the carcass (B).

• Applying a small hand effort, turn the fastener (C) following the arrow direction (left hand thread), releasing it.

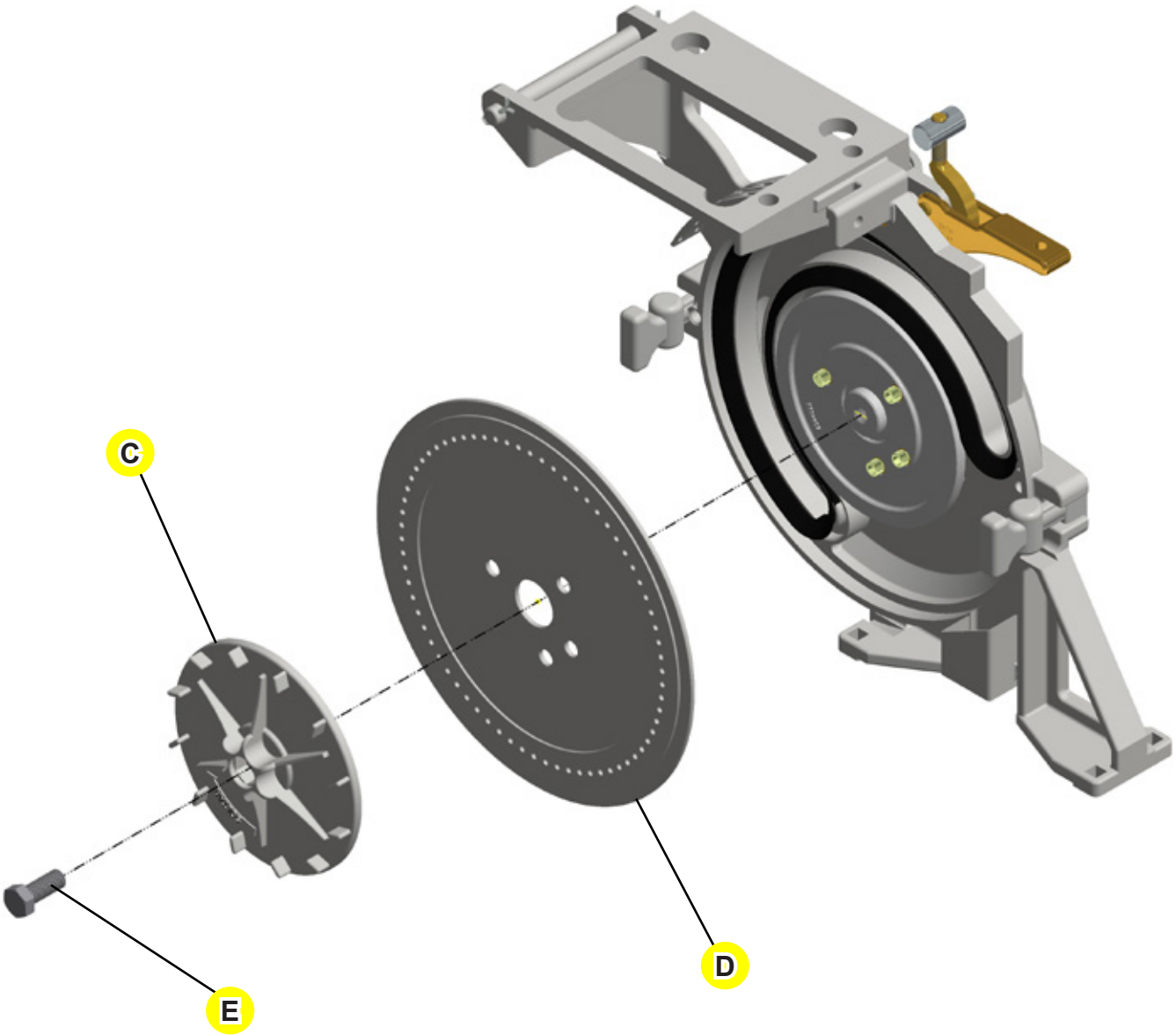


• After removing the fastener (C), remove the seed plate (D) and change it.

• To assemble the vacuum seed meter again, do the procedures in reverse order.

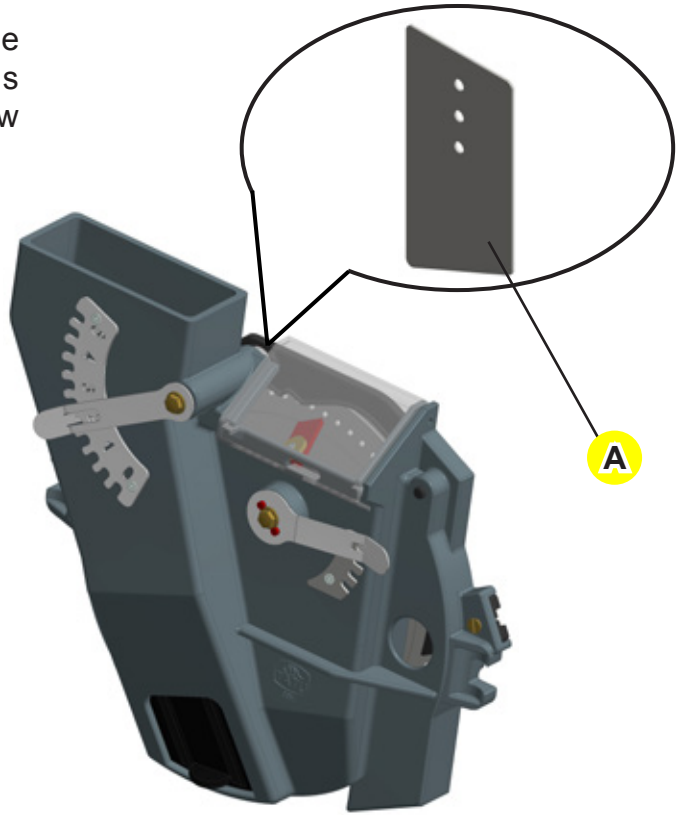
• After placing the seed plate (D), position the fastener (C), hold the bolt (E) and turn it in the opposite way of the arrow.

• Lock the carcass (B) with the lid fasteners (A).



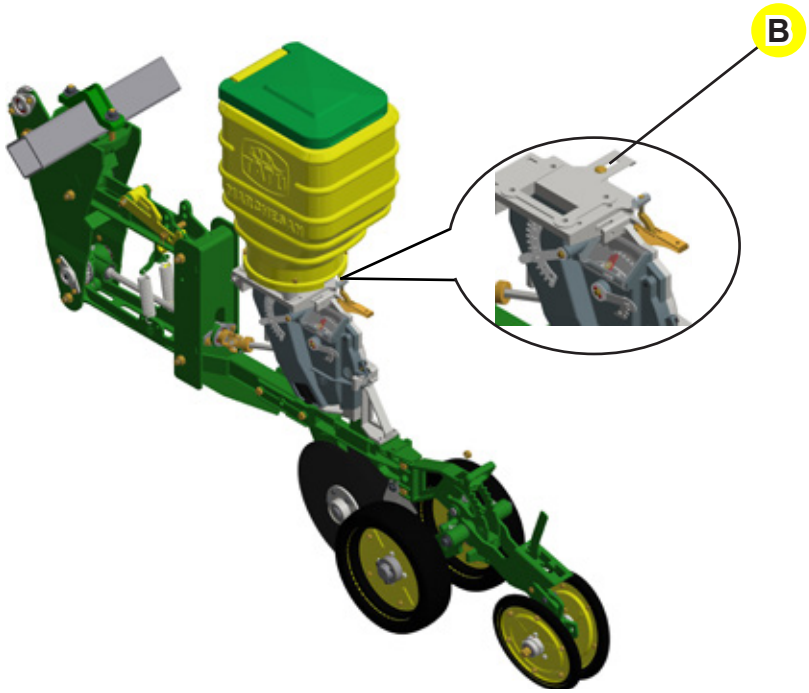
Deflector plate adjustment

The metering possesses the deflector plate (A), which features adjustments to set the seed flow entrance in the mechanism.



Stopping the seed flow

To change the seed plates or for any internal inspection in the metering, use the interrupters (B) and release the wing nut to isolate the amount of seeds in the hoppers.



NOTE **After the inspection, tight the wing nut properly so it will not get loose during operation.**

Appropriate suction

The appropriate suction is obtained after driving some meters with the planter, when the seeds are already housed in all the holes of the plate.

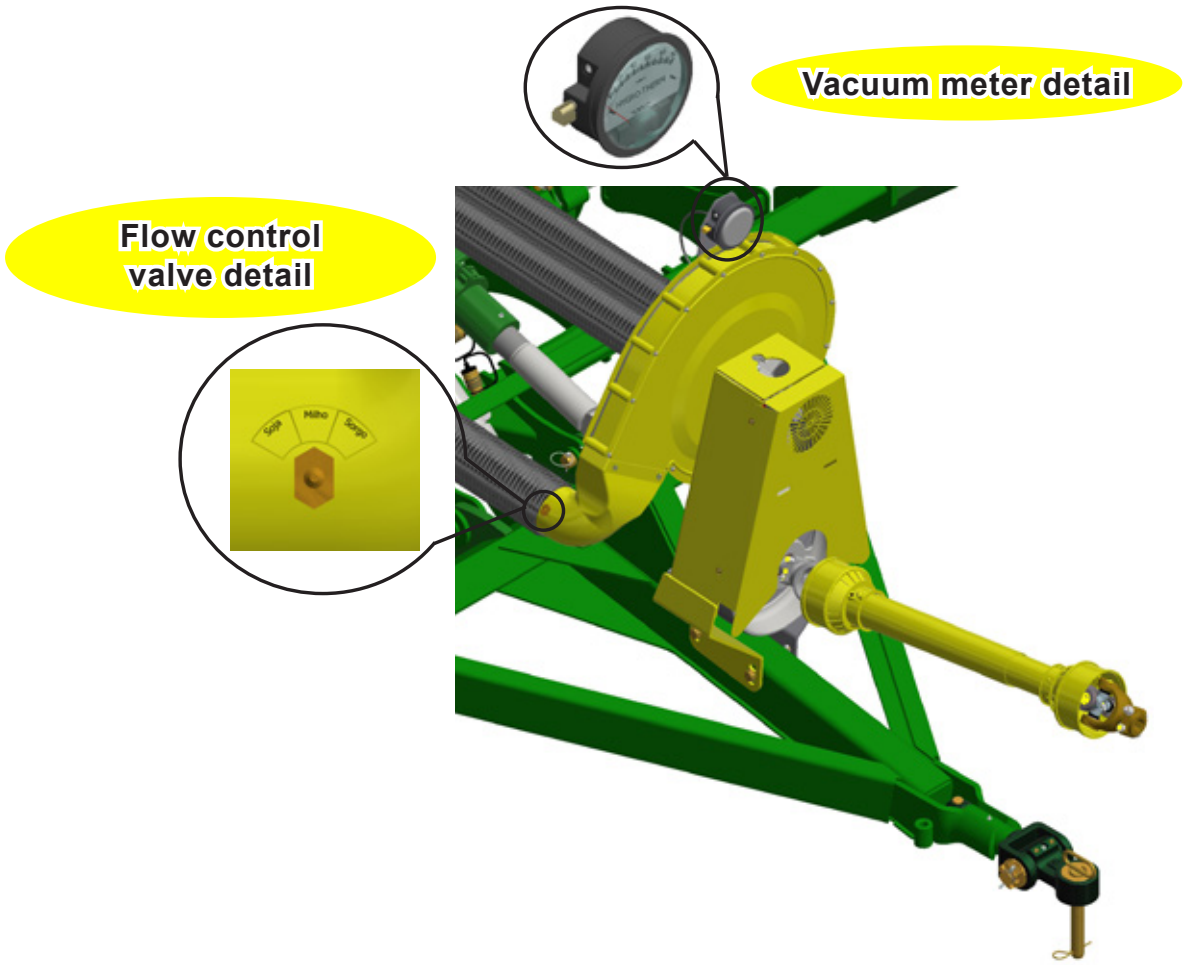
The PTO drive shaft should operate at 540 rpm constantly.

The activation by the hydraulic motor should keep the command lever in a constant activation, in a way that it keeps sending oil in the whole plantation process without interruption.

The proper adjustment of the flow control valve depends on the amount of row units of the planter and type of seeds.

Vacuum meter suction verification

The values between 40 and 90 millibars of vacuum are adequate for most light, medium and heavy seeds.



NOTE **Whenever adjusting the valve, it is necessary to make a verification in the seed plate performance.**

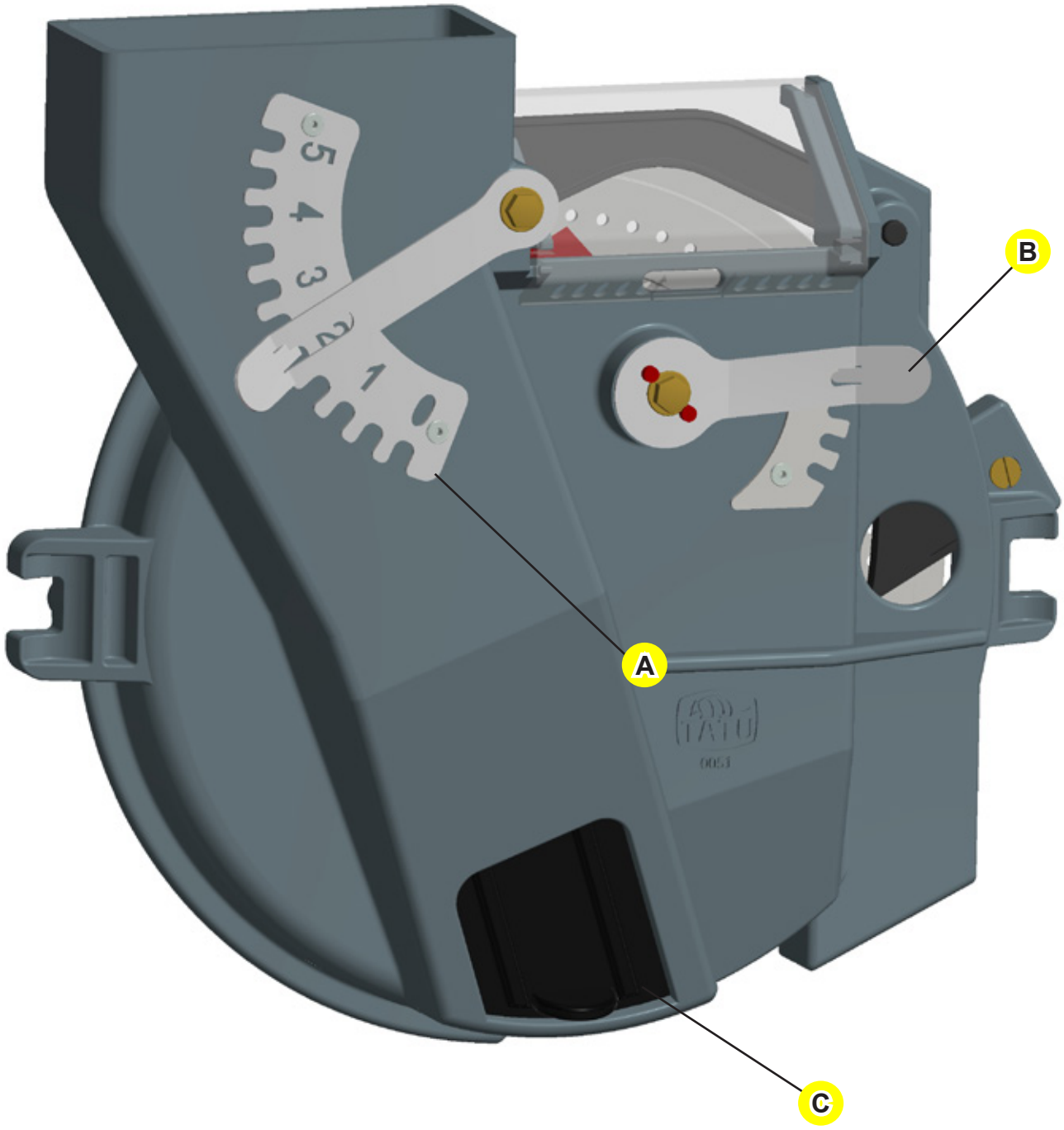
Adjusting the selectors

In order to make the plate transports only 01 (one) seed per hole, it is necessary to adjust the selectors precisely to avoid seeds in duplicate. The superior selector (A) offer several adjustments in the scale, depending on the type and shape of the seeds.

The inferior selector (B) constitutes the second fine control and it carefully removes the seeds in excess. It can be regulated in several positions.

These adjustments should be made individually in all row units.

Remove the cover (C) periodically to clean the residues.



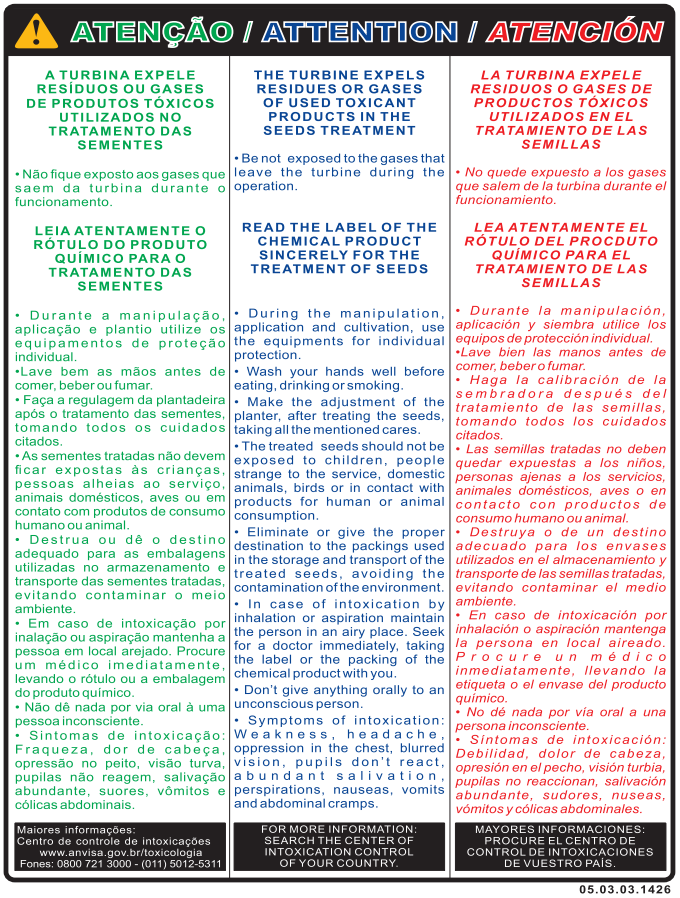
Adjustments and quick inspections

PROBLEMS	CAUSES	POSSIBLE SOLUTIONS
Seed failures	• Low suction	• Ideal PTO rotation speed; • Check the air hoses
	• Improper selectors adjustment	• Adjust the selectors properly
	• Very small diameter of the seed plate holes	• Use a seed plate with suitable holes to the seeds.
	• Excessive working speed	• Ideal working speed: 5 to 7 km/h.
	• Odd material	• Use seeds with pre-cleaning at least
	• Lack of seeds in the metering	• Check the deflector plate opening; • Interrupters are closed or semi-closed
	• Worn-out selectors	• Replace the selectors
	• Dirty selectors	• Clean with water, detergent and steel wool
	• Obstructed holes	• Clean with compressed air
Duplicate seeds	• Improper selectors adjustment	• Adjust the selectors properly
	• Very big diameter of the seed plate holes	• Use a seed plate with suitable holes to the seeds
	• High seed level in the metering	• Adjust the deflector plate
Seeds over the ground	• Seed excess in the metering/ too high level	• Check the opening of the deflector plate/ adequate to the seed size
Irregular plantation	• Totally disajusted seed plate	• Adjust the hole diameter according to the seed
	• Disajusted selectors	• Adjust the selectors properly
	• Low suction	• Check the PTO rotation speed; • Check the oil flow rate; • Check the hoses
	• Worn-out tires	• Replace for original ones
	• Tires with different inflation	• Inflate properly (75 PSI)
	• Tires with different design	• Use tires with the same design
	• Seed density not observed	• Check the drive and driven shaft on both sides
	• Skidding excess	• Ballast the tires with water and apply pressure in the wheelset springs
Damaged seeds	• Very big seed plate holes	• Use a seed plate with an appropriate hole in accordance to the seed
	• Worn-out rubber switch	• Replace it
Interruptions in the fertilizer metering	• Odd material in the fertilizer or cobbled fertilizer	• Check the fertilizer quality
	• Deformed fertilizer tube	• Replace the tube

Safety stickers

The safety stickers warn about the equipment points that require more attention and they should be kept in good repair. If the safety stickers become damaged or illegible, replace them. Marchesan provides these stickers, upon request and indication of the respective serial numbers.

05.03.03.1427



05.03.03.1426

Adhesive label

Model	Serial number	Serial number	Serial number
ULTRA FLEX SUPREMA	05.03.03.3853 Small logo	05.03.03.3854 Big logo	**05.03.03.3909** ULTRA FLEX SUPREMA logo

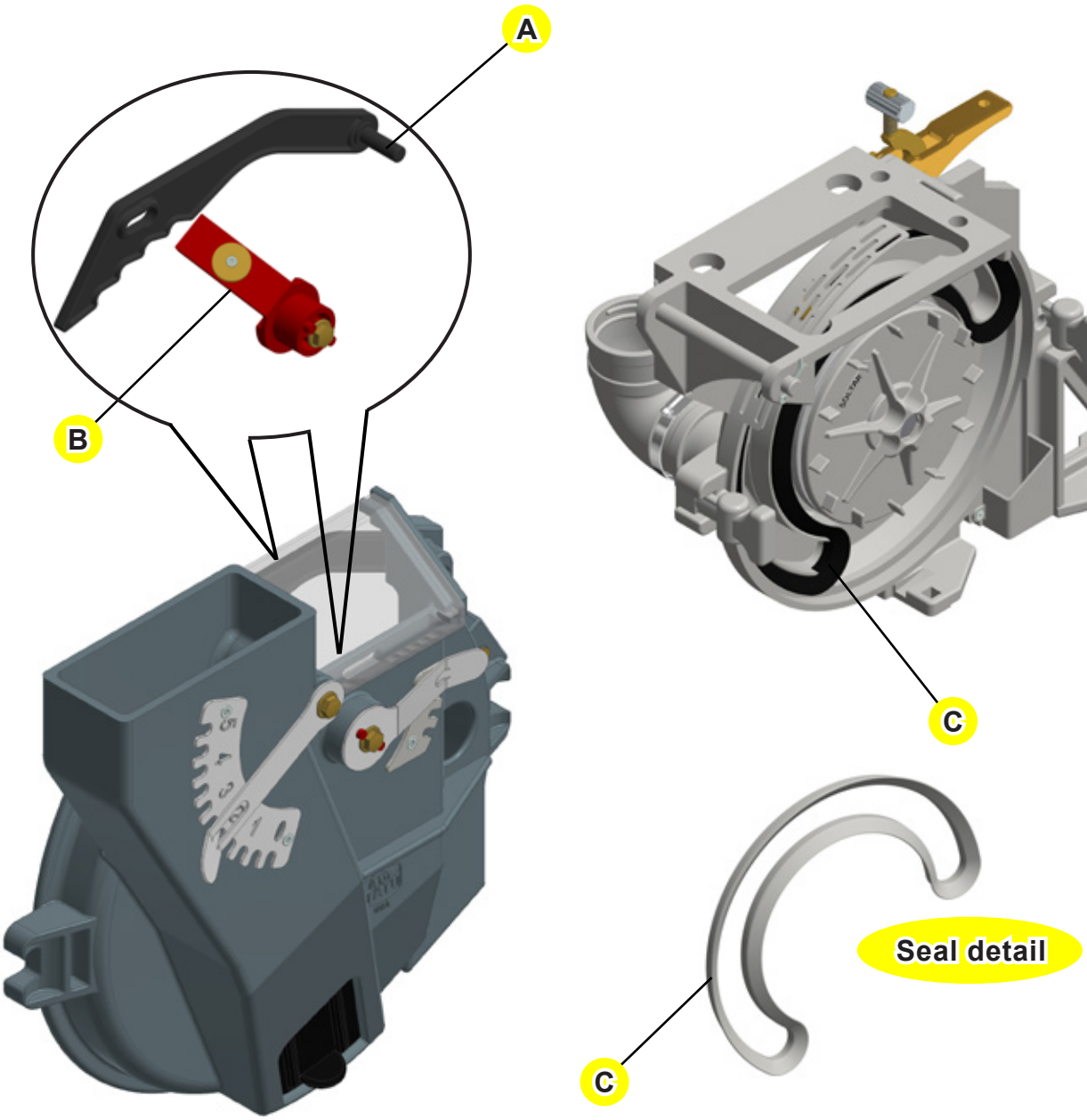
Seed metering maintenance

In the interval of each planting season, disassemble all the seed metering and verify the following steps:

• Wearing of the seed selectors (A and B);

• Vacuum switch (C): This device assures that the vacuum is directioned where the suction only works in the seed hopper, when there is no vacuum in the clearance area.

Soon after, use compressed air for cleaning all the seed meterings.



NOTE

- **Use graphite powder in the vacuum switch (C).**
- **Never use sharp or metallic objects to scrape the seed plates.**

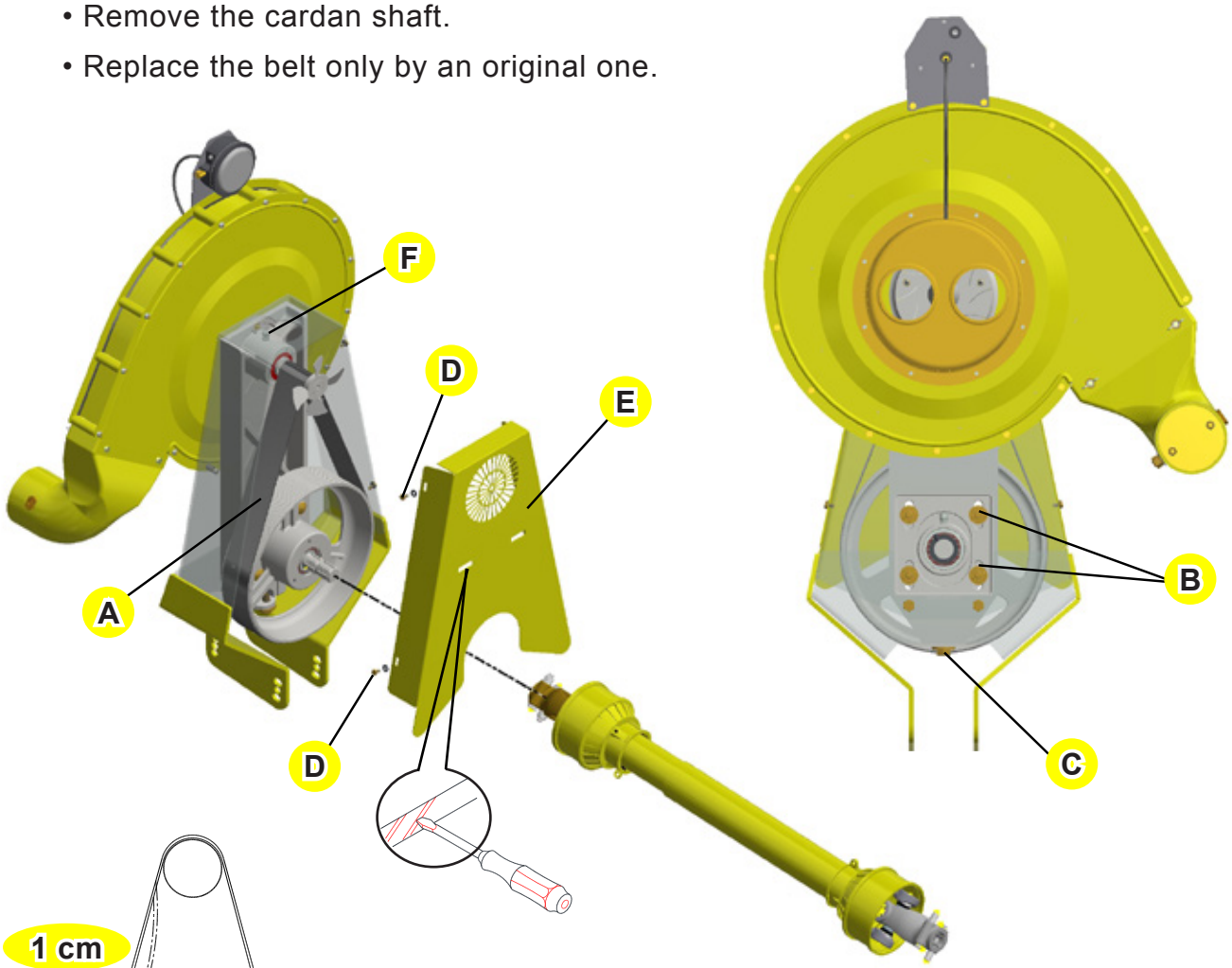
Blower maintenance

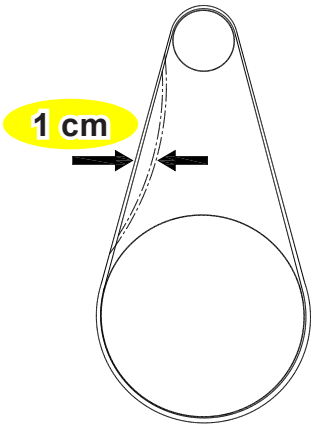
Periodically verify the tension of the blower belt through the ventilation tears, according to the detail (A).

If necessary, use the tightener by releasing the bolts (B) and adjusting it through the bolt (C), flat washer and cotter pin.

To replace the belt, do it on the following way:

- Loosen the tightener by releasing the bolts (B).
- Remove the bolts (D) and the cover (E).
- Remove the cardan shaft.
- Replace the belt only by an original one.

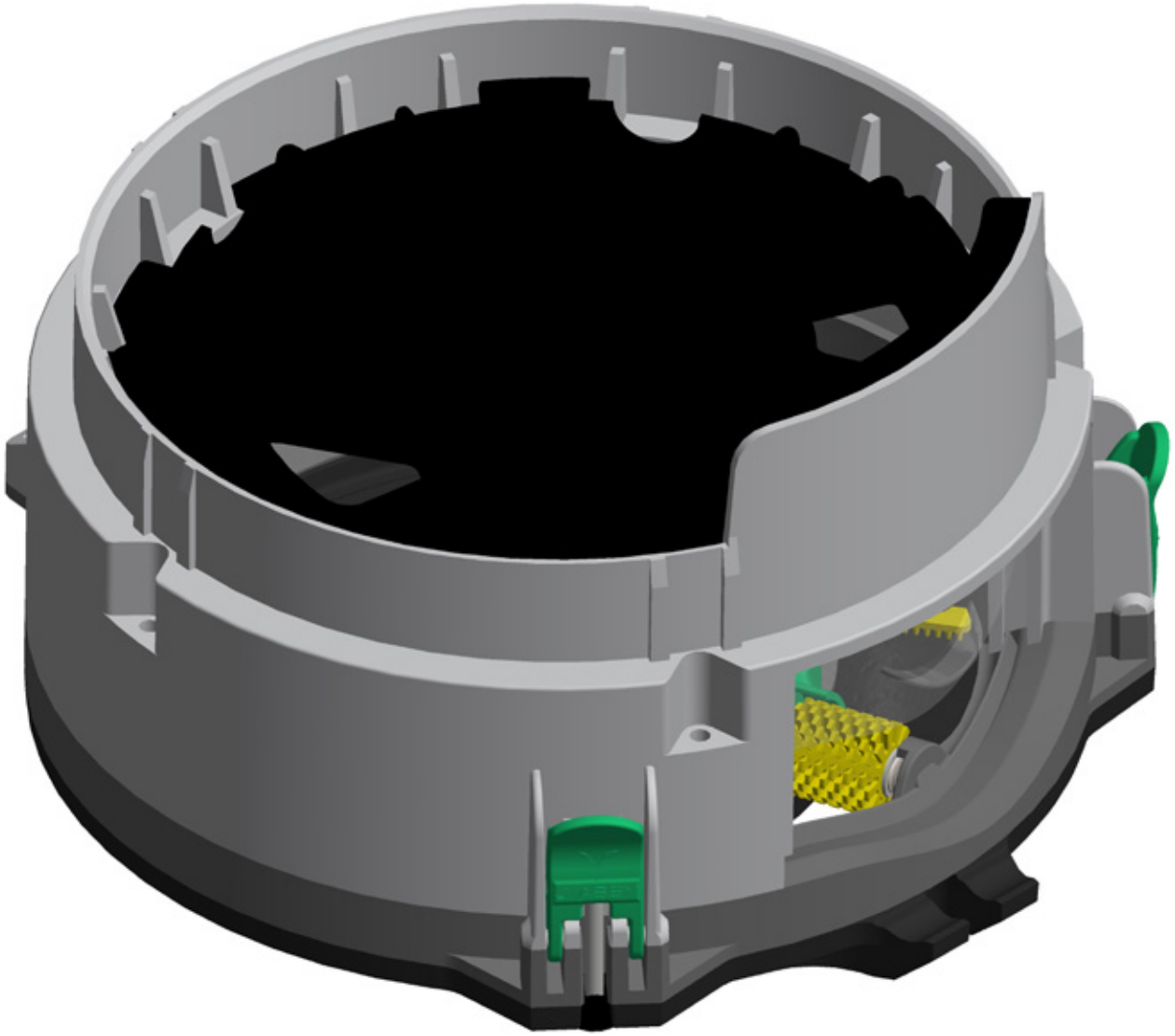




The tension distance should not be bigger than 1 cm.

NOTE **Use Shell Stamina RL 2 or equivalent grease on the bearing (F) fan.**

Titanium Apollo

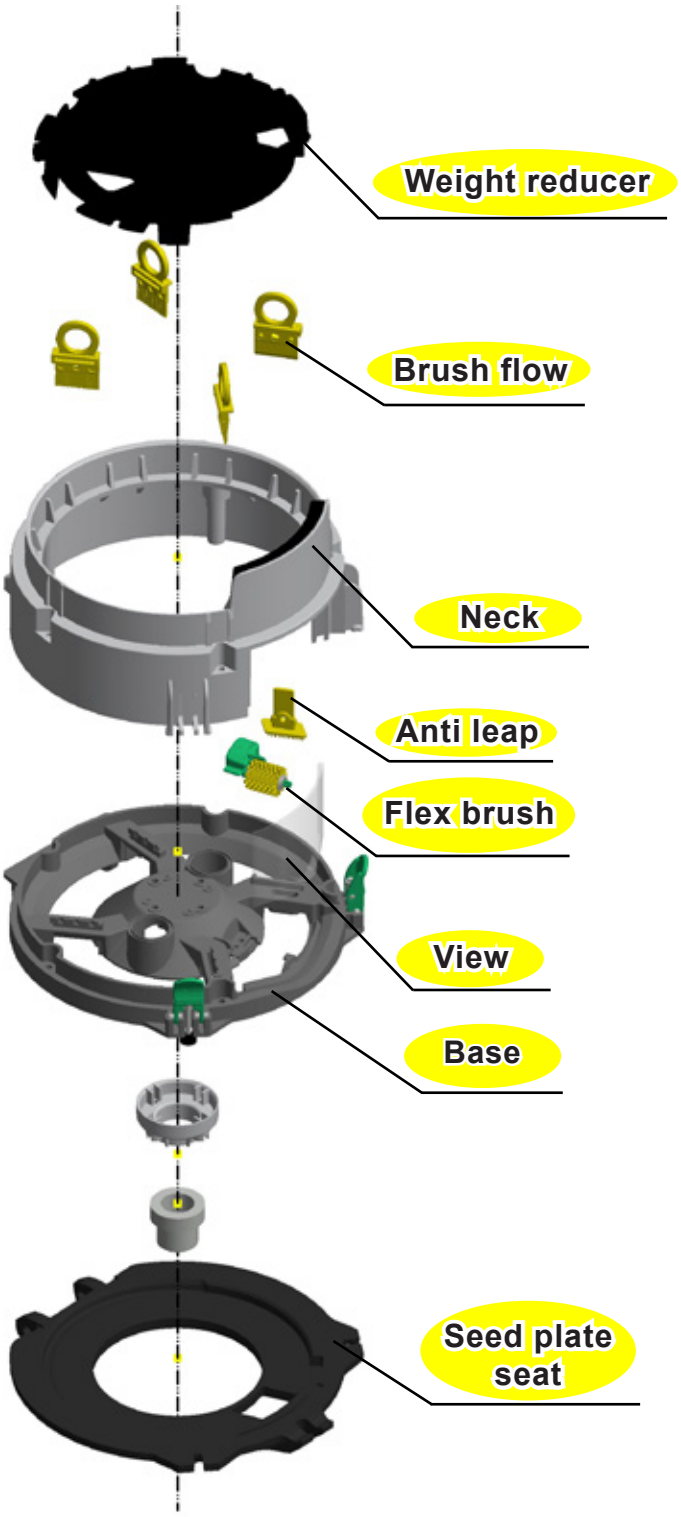


Seed dosing system for mechanical machines

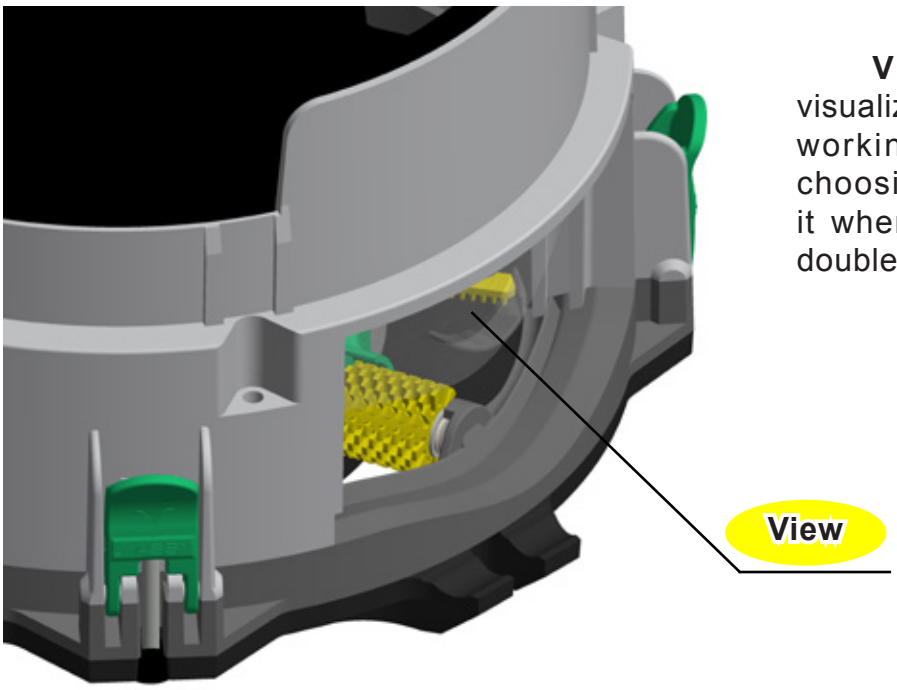
• **Titanium** is a mechanical distribution seed system. It provides an easy maintenance to the farmer.

• An easy-to-use equipment because it works as a seed plate. It features several technologies in order to provide a greater security and an excellent planting to the farmer.

Components and assembly

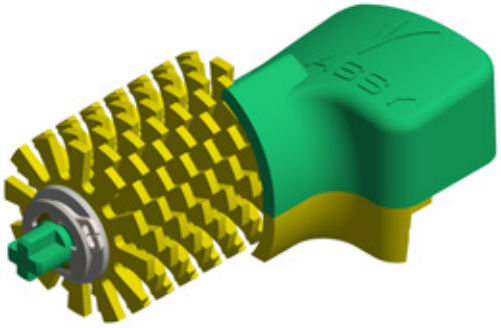


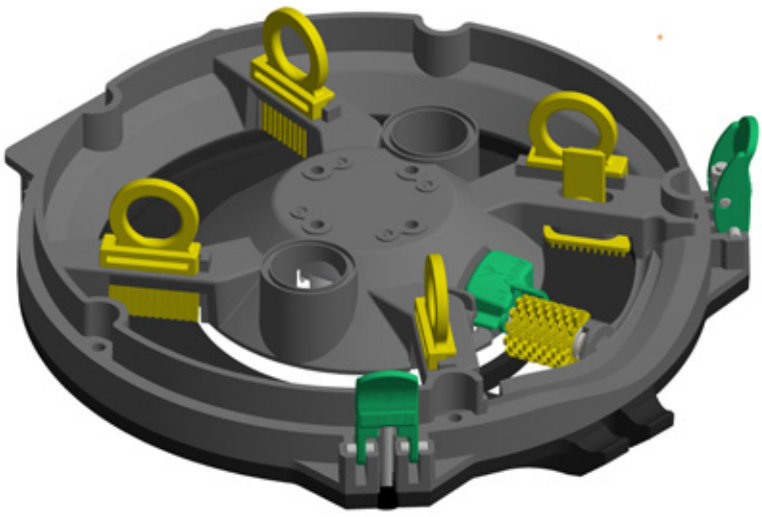
Main technologies



View: Allows a real time visualization of the seed plate while working, what is practical when choosing the plate and to adjust it when planting incorrectly (skip/ double seeds).

Flex brush: Remove the seeds that did not fall off by gravity. Its contact with the seeds provides less friction and less damage to them. It is possible to plant 05 (five) cultures without changing it, just being necessary to change the seed plate and rings.





Brush flow (Organizers): There are four organizers inside the box, designed in polyurethane. This system drastically reduce the possibility of mechanical damages (breaks, cracks and others) in the seeds and also raise the chances of the seeds to remain organized in the seed plate holes.

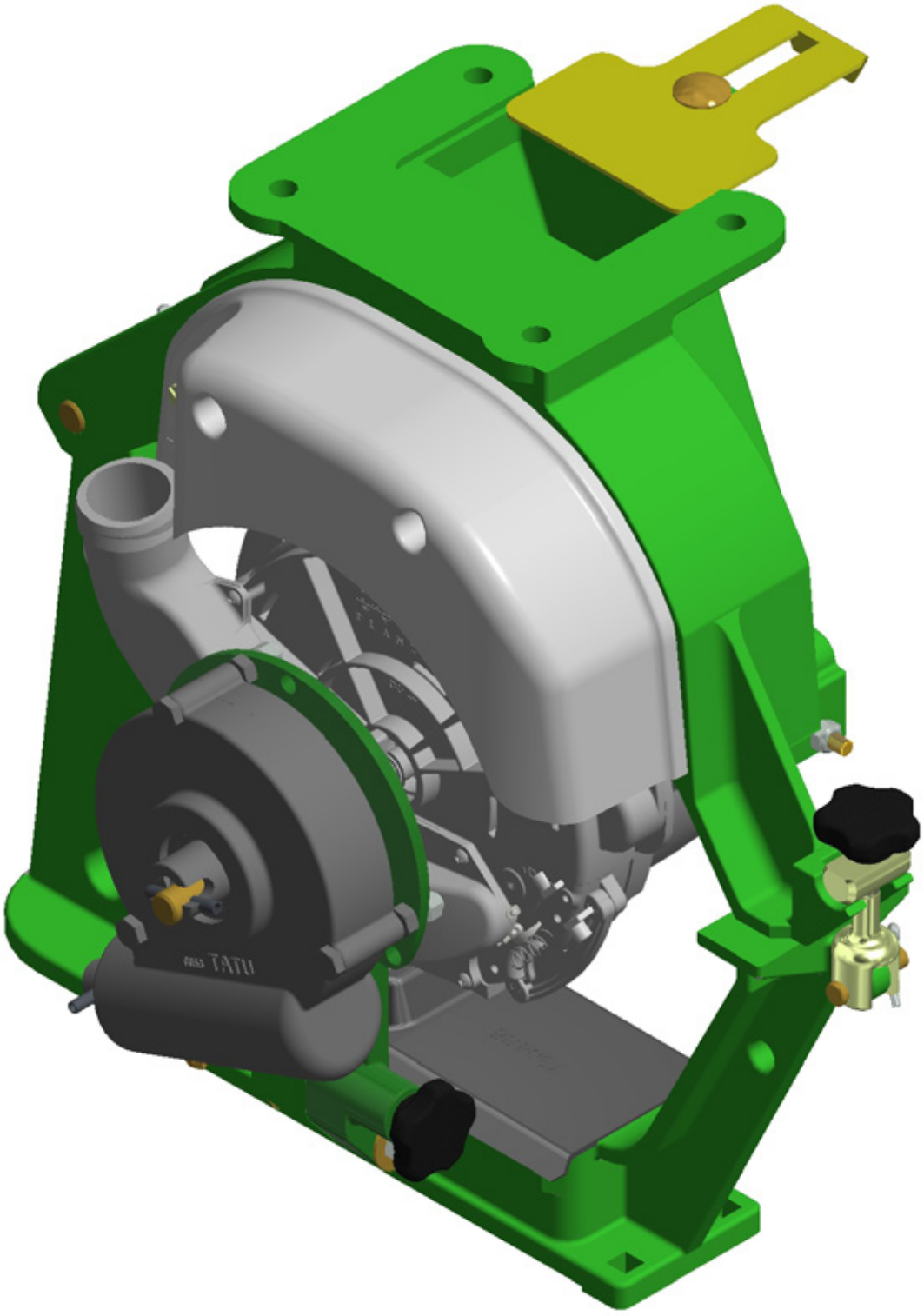
Standard seed plates - TITANIUM

Seed plates	Amount of holes	Serial number
CORN	28 holes	05.03.01.6204
SOYBEAN	90 holes	05.03.01.6217
SOYBEAN	90 holes	05.03.01.6218

Optional seed plates - TITANIUM

Optionally, MARCHESAN supplies seed plates for several crops, according to the list below:

Seed plates	Amount of holes	Serial number
CORN	27 holes	05.03.01.8481
CORN	27 holes	05.03.01.8482
BEAN (MEDIUM)	70 holes	05.03.01.8468
SOYBEAN	80 holes	05.03.01.8483
BEET / ONION	32 holes	05.03.01.8496
SORGHUM	32 holes	05.03.01.8159
PEANUT	32 holes	05.03.01.8497
CANOLA	80 holes	05.03.01.8498



Precision Planting vacuum seed meter

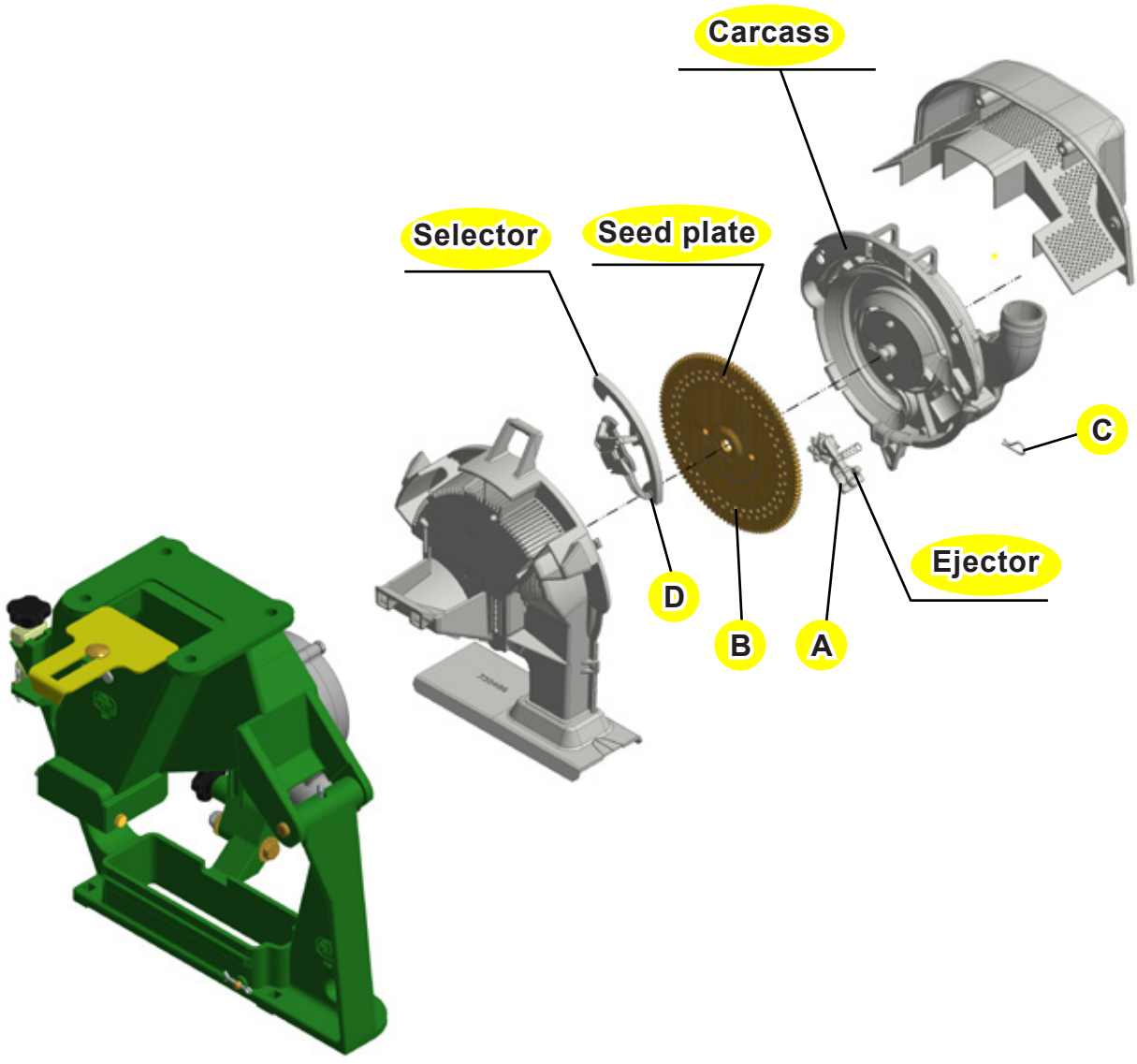
Changing the metering set

The metering set is composed by a seed plate, selector and ejector.

To change or fix the metering set, proceed as follows:

Place the ejector set (A) in the carcass; then place the seed plate (B) and lock using the pin (C). Lastly, place the selector (D).

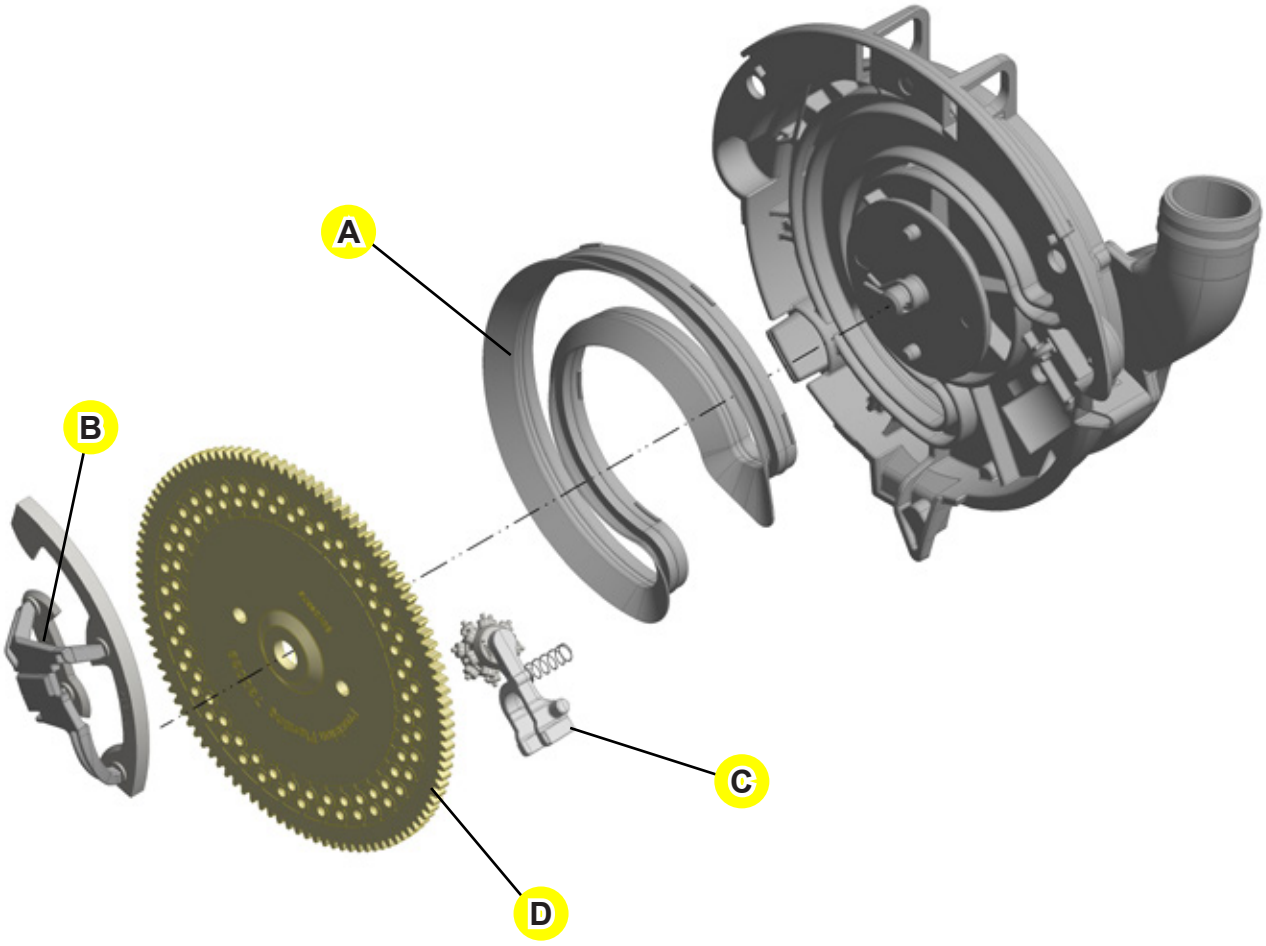
To remove the parts, do the reverse operation.



NOTE **Special attention should be given when placing the seed plate. Be sure to not curl or smash the seal. If there is any damage such as cracks or mends in the seal, replace it immediately.**

Pneumatic sealing

The pneumatic sealing (A) is a device that assures the vacuum directioning, where the suction only acts in the seed hoppers with no vacuum in the area of release. The seeds are released in the center of the conductor.



Seed metering maintenance - Precision Planting

During the planting recess, disassemble every seed metering and check the following points:

- Wearing of the seed selectors (B) and ejector (C).
- Pneumatic sealing (A) - check if there is no crack or wearing.
- Seed plates (D) - replace them if the holes get deformed or if the seeds are going to the vacuum side.

Then, use compressed air to clean every metering mechanism.

In disuse period disassemble every metering system, remove all the components of the metering set and store in a clean place.

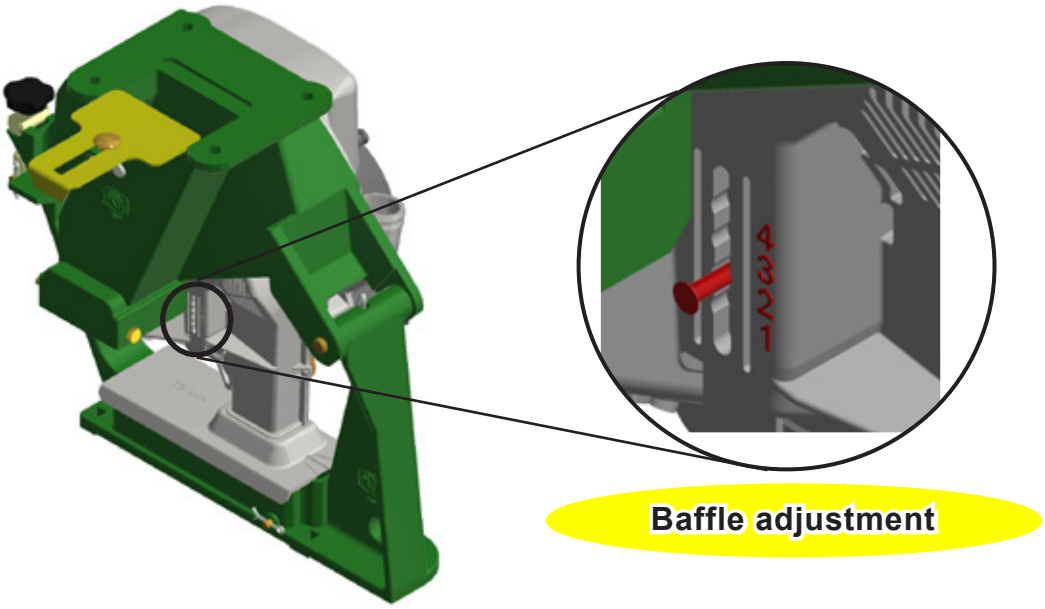
NOTE

- **Spray powder graphite in the pneumatic sealing (A).**
- **Never use sharp or metallic objects to scrape the seed plates.**

Baffle position

Precision planting has an adjustment to input the seeds situated in the metering with 4 (four) adjustment levels, which the operator can adjust according to the seed size.

For a better performance in the plantation, the operator should follow the tables from the previous pages.



Standard seed plates - ULTRA FLEX PRECISION PLANTING

Culture		Corn	Sunflower	Soybean	Bean (small)
Size (Seed / Kg)		2200 - 6200	4400 - 8800	4400 - 10000	> 4400
Vacuum (millibar)		50	30 - 32	50	45 - 55
Baffle position		2	4	4	2
Seed plate	Number of holes	27		80	
	Hole diameter	4.47		3.93	
Part number		05.03.06.2417		05.03.06.2407	

NOTE

- **For correct WaveVision operation, the smallest diameter of any seed in any direction must be .150" or greater.**
- **Milo screens needed for Central fill planters only.**
- **For optimal performance with large, long seeds, the singulator may need to be removed.**
- **For some seed sizes it may be necessary to remove the baffle completely to prevent bridging of large seeds.**
- **In some planting situations the owner should only replace the singulator, ejector or seed plate.**

Optional seed plates - PRECISION PLANTING

Optionally, MARCHESAN supplies seed plates for several crops, according to the list below:

Culture		Sorghum / Milo / Beet	Cotton	Bean (medium)	Bean (large)	Canola	Peanut
Size (Seed / Kg)		26K - 42K	9300 - 14000	2860 - 4400	< 2860	166K - 400K	445 - 3111
Vacuum (Millibar)		25 - 40	60	45 - 60	45 - 65	55 - 65	50 - 70
Baffle position		1	2	3	4	4	4
Seed plate	Number of holes	32	32	70	32	80	32
	Hole diameter	2.18	2.92	4.32	5.33	1.19	5.84
Part number		05.03.06.2471	05.03.06.2586	05.03.06.2564	05.03.06.2573	05.03.06.2575	05.03.06.2576

Optional seed plates - PRECISION PLANTING

Culture		Sweet corn			
Size (Qualitative)		Small	Medium	Large	Extra large
Size (Seed / Kg)		4400 - 10200			
Vacuum (Millibar)		45 - 50			
Baffle position		4			
Seed plate	Number of holes	27	27	27	27
	Hole diameter	3.175	3.43	3.68	3.94
Part number		05.03.01.8491	05.03.01.8492	05.03.01.8493	05.03.01.8494
Singulator					
Part number		05.03.06.2472*	05.03.06.2472*	05.03.06.2472*	05.03.06.2472*
Ejector					
Part number		05.03.06.2570	05.03.06.2570	05.03.06.2570	05.03.06.2570

NOTE *** Standard part.**

Culture		Popcorn			Pumpkin
Size (Qualitative)		Small	Medium	Large	Del Monte / Libby
Size (Seed / Kg)		3300 - 10650			-
Vacuum (Millibar)		60			27 - 30
Baffle position		2			3
Seed plate	Number of holes	27	27	27	27
	Hole diameter	2.92	2.92	3.175	3.175
Part number		05.03.01.8482	05.03.01.8482	05.03.01.8491	05.03.01.8491
Singulator					
Part number		05.03.06.2472*	05.03.06.2472*	05.03.06.2472*	05.03.06.2472*
Ejector					
Part number		05.03.06.2570	05.03.06.2570	05.03.06.2570	05.03.06.2570

NOTE *** Standard part.**

Optional seed plates - ULTRA FLEX PRECISION PLANTING

Culture		Sunflower			
Size (Qualitative)		#1	#2	#3	#4
Size (Seed / Kg)		6,6K - 10K			
Vacuum (Millibar)		27 - 30	27 - 30	27 - 30	15 - 17
Baffle position		4	4	3	2
Seed plate	Number of holes	27	27	27	27
	Hole diameter	3,94	3,43	2,92	2,92
Part number		05.03.01.8494	05.03.01.8492	05.03.01.8482	05.03.01.8482
Singulator					
Part number		05.03.06.2472*	05.03.06.2472*	05.03.06.2472*	05.03.06.2472*
Ejector					
Part number		05.03.06.2570	05.03.06.2570	05.03.06.2570	05.03.06.2570

NOTE *** Standard part.**

vDrive components maintenance

• When finishing and restarting the planting season, clean the harness connection that were exposed to the environment.

• When using a pressure washer, do not direct water jet to the electronic modules (SRM, Power Module, PDM, Smart Connector, RUM, vDrive and others), seed meterings and harness connections.

• When disconnecting a connection during the planting season for maintenance or disassemble purposes, the exposed connectors must be protected from the environment.

Adjustments and quick inspections

PROBLEMS	CAUSES	POSSIBLE SOLUTIONS
Seed metering	• Row unit without seeds	• Check the clutch; • Check the vacuum
	• Damaged security pin	• Replace the security pin
	• Seed obstruction	• Set the deflector in a higher position
	• Seed milling	• Check the seed plate chock
	• Small hole diameter	• Use an appropriate hole to the seed,
	• Obstructed holes	• Clean using compressed air
	• Locked metering	• Check the metering system to discover the reason to be locked
	• Excessive work speed	• Ideal working speed: 5 to 7 Km/h
Too many skips	• Fragments in the metering system	• Be sure that there is no fragment in the seed plate holes
	• Singulator flaw	• Check the correct installation and the proper adjustments of the singulator in the seed plate surface
	• Debris in the metering system	• Check the exit chute and the seed tube
	• Lack of pressure in the vacuum system	• Check if there is any leak in the vacuum system
Bad spacing	• Seed deviation	• Check the exit chute from the metering system and seed tube
	• Failing to activate the metering systems	• Check the system and make sure that the belt is in good condition and properly lubricated
	• Noise in the metering system	• Remove the seed plate and remove debris that may cause the noise
	• Seed fragments between the seed plates gear teeth	• Clean and add chocks
	• Seed in contact with the seed tube and exit chute	• Be sure that the seed hopper is positioned in a way that the metering system release the seeds in the center of the seed tube
	• Lack of graphite	• Be sure that the graphite is being used and mixed in the seed hopper
Wrong population	• Using hydraulic motors	• Check the calibration and motor settings twice • Check if the rotation of seeds setting is correct

Important

ATTENTION

MARCHESAN S/A reserves the right at any time to make improvements in the design, material or specifications of machinery, equipment or parts without thereby becoming liable to make similar changes in machinery, equipment or parts previously sold.

Images are for illustration purposes only.

Some illustrations in this manual appear without the safety devices, removed to allow a better view and detailed instructions. Never operate the equipment without these safety devices.

TECHNICAL PUBLICATION DIVISION

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Notes