GAPCR 360

OPERATOR'S MANUAL

TATU MARCHESAN

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

The GAPCR 360 disk harrow is indicated for deep plowing jobs over soils that were already cultivated. This harrow incorporates sugar cane hedges and grains, and also performs the recovery of pastures, providing a high yield due to its great cutting width and its capacity of penetrating on the soil.

Reinforced wheels with high flotation tires 400/60 and cylinder for activation.

Notched disc blades manufactured with strict standards feature high resistance to wear and impacts.

Equipped with permanent oil bath roller bearings. They have a protection cover on the lower part to protect the bearing body for when it is frictioning against the soil.

This operator's manual contains the necessary information for the best performance of this harrow. 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 your dealer and the Technical Support department of the factory. They can ensure the fully functioning of your TATU disk harrow.

TATU
MARCHESAN

Table of contents

To the owner

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

• Warranty certificate;

• Operator's 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.

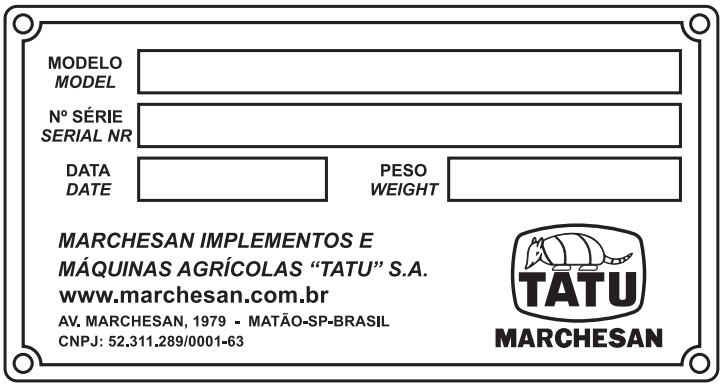
Important

- **Only people who own a full knowledge of the tractor and equipment must transport, operate and carry out any maintenance on 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.



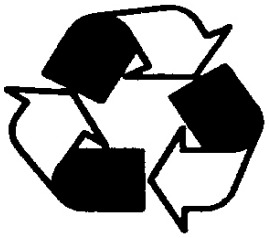
NOTE **The warranty shall not be applied to any equipment, or any parts thereof, which has been altered elsewhere than at the place of manufacture or which the original purchaser thereof, at retail, has used or allowed to be used parts, not made or supplied by Marchesan S/A.**

To the operator

Be careful with the environment

Dear operator!

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 can be spilt over the soil and penetrate the underground layers, thus 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 to prevent accidents.**
- **The instructions under this symbol refers to the safety of the operator, mechanician or third parties, therefore they should be carefully read and observed. When the safety instructions are not being followed, a serious accident or even death may occur.**

The GAPCR 360 disk harrow is simple 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 harrowing, transportation, maintenance and storage.

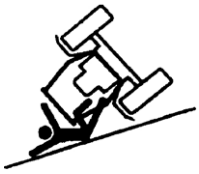
Read and understand the information before making any adjustment or maintenance.

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 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 or 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 carry out any maintenance or to transport the equipment.

To the operator

- Only trained and qualified personnel are 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 or to get over the equipment, while it is operating, during transportation or storage.
- When setting the disk harrow to transport position, check if there are no people or animals close or under it.
- 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.
- Wear protective gloves to work near the cutting parts.
- Never operate the equipment without its **protective devices**.
- 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.
- Carefully check the transport width on narrow locations.
- Be careful while hitching the equipment to the tractor.
- Only pull the equipment using a tractor with appropriate power.
- Do not drive the equipment under the influence of alcohol or any soothing/ stimulating medicine, as it may result in a serious accident.
- In case of a fire outbreak or any possible hazard, the operator must leave the area as fast as possible and look for a safe place. Always have emergency numbers at hands.
- In case of emergency, know how to stop the tractor and disk harrow quickly.
- Always shut down the engine, remove the key and use the handbrake before leaving the tractor seat.
- Never attempt to change the adjustments, clean or lubricate the equipment while it is moving.
- Whenever you unhitch the equipment, either in the field or shed, do it on a flat and firm surface and use jacks. Make sure the equipment is properly supported.
- We suggest that you carefully read the manual, as it will be a guide for periodic verifications that need to be done and will allow that you assure the maintenance of your equipment.
- If there is any doubt after reading it, ask your dealer. For more complicated operations, there will be the right person to help you there.
- Please check the general safety instructions on the back cover of this manual.

Transportation over truck or trailer

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 other 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 appropriately.

- Use chock blocks and safety chains to secure the equipment to the truck or trailer during the transport.

- Make sure the SMV (Slow Moving Vehicle) sign, and all the lights and reflectors that are required by the local highway and transport autorithies are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

- 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 to the truck or trailer. If necessary use banners, lights and other devices in order to give adequate warning to the other drivers.

Working safety standards

It is important to have knowledge not only about the functioning, operation of the equipment and its technology, but also the working legal aspects when using the equipment, such as: safety standards, operator's manual and working safety.

The equipment and tools used on the rural area must be properly handled, otherwise health and safety of involved personnel may be compromised.

The operator must be capable and authorized to operate the tractor, meaning that that person must comprehend the functioning instructions of the tractor and know about the safety standards regarding the job that will be performed.

The Ministry of Labor and Employment created safety standards that aim to decrease the risk of accidents that may occur to the rural worker. Related to the subject of agicultural machines and equipments, we specifically cited the **NR 06**, **NR 12** and **NR 31** standards.

Regulatory Standard - **NR 06**:

• For purposes of applying this Regulatory Standard, Personal Protective Equipment (PPE) is considered any device or product that is worn by an individual worker for protection against risks that could threaten safety and health at work.

Regulatory Standard - **NR 12**:

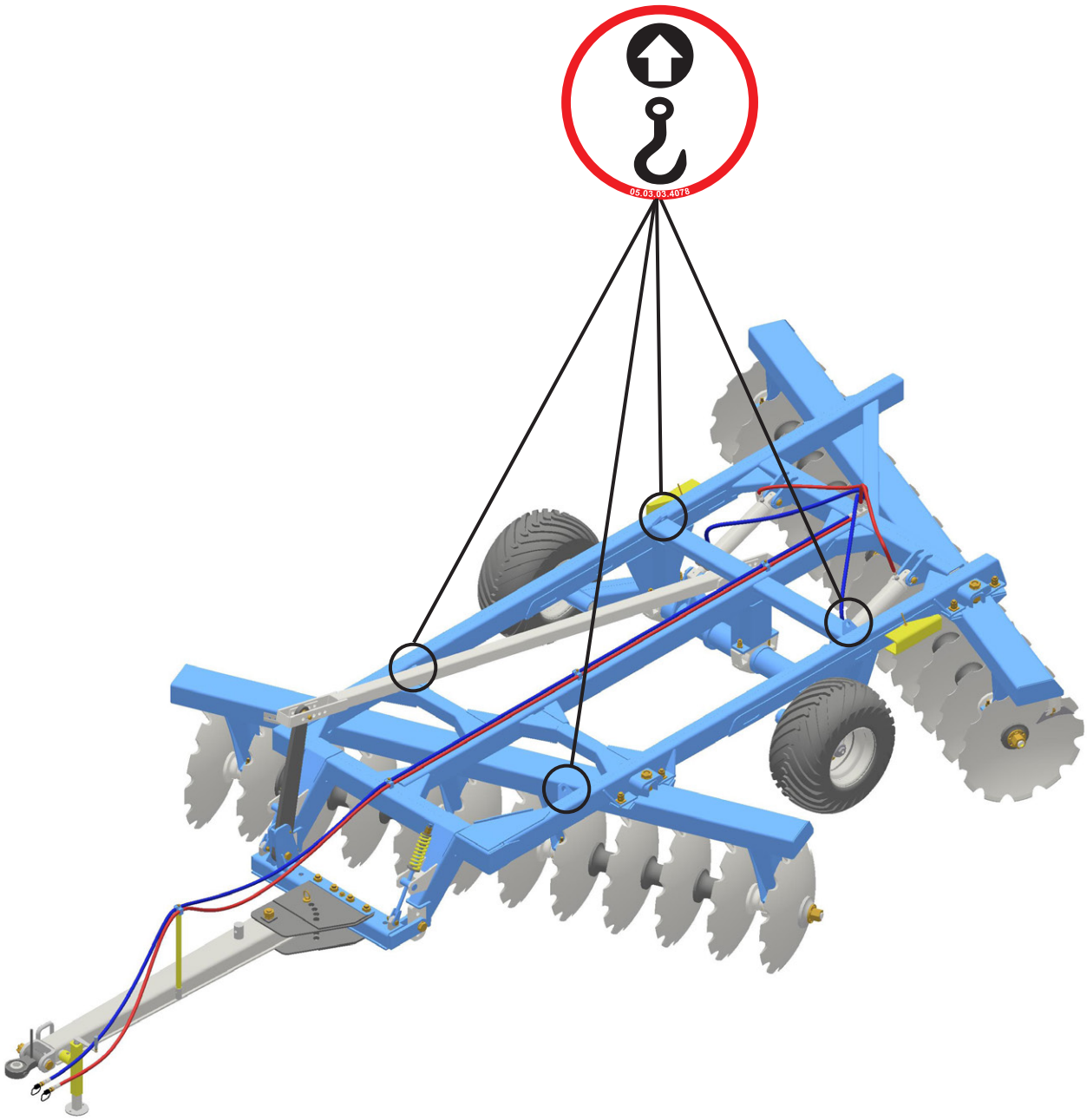
• This Regulatory Standard and its annexes provide technical references, basic principles and protective measures to ensure the health and physical integrity of workers and establishes minimum requirements for the prevention of accidents and occupational diseases in the design stages and use of machinery and equipment of all kinds, and also to its manufacture, importation, trading, exhibition and cession in any way. It is understood as using phase the construction, transportation, assembly, installation, adjustment, operation, cleaning, maintenance, inspection, disabling and dismantling of machinery or equipment.

Regulatory Standard - **NR 31**:

• This Regulatory Standard has the purpose to establish the precept to be applied on the organization and on the working environment, in order to make compatible the planning and development of agriculture, livestock, forestry, forest exploration and aquaculture with safety on the working environment.

Lifting points

This equipment has adequate lifting points located on the frame. When lifting the equipment with a hoist, it is essential to hitch the cables to all points.



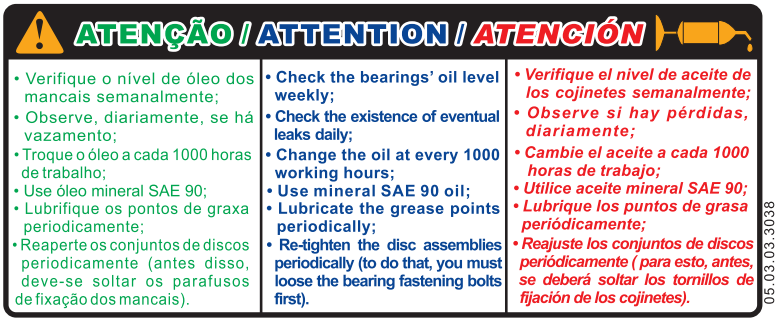
Use chains, of at least 3 meters long, to lift the equipment safely.

Use the adequate points for lifting and be sure that the equipment is safe. Avoid accidents.

Always keep a safe distance from the equipment.

Safety decals

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



Decal set

Qty.	Model	Serial number
2	GAPCR 360 decal	**05.03.06.1972**
1	Read the manual decal	**05.03.03.1428**
1	Danger decal	**05.03.03.1739**
1	Lubricate and retighten daily decal	**05.03.03.1827**
1	Danger decal	**05.03.03.3038**
4	Lifting points decal	**05.03.03.4078**
1	Warning decal	**05.03.03.1738**

Data sheet

Type: ..... Wheel Type Offset Disk Harrow

Model: ..... **GAPCR 360**

Number of disc blades: 12, 14, 16, 18, 20, 22, 24, 28

Spacing between disc blades: .....360 mm

Disc blades dimension: .....Ø 32"x 9 mm, Ø 34" x 9 mm and Ø 34" x 12 mm

Disc blade type: ..... Concave notched

Bearings - Length: .....352 mm

- Type: ..... Conical roller bearing

Spacer spools - Length: .....352 mm

- Type: ..... Cast

Axle diameter: .....Ø 50.80 mm (2")

Hitching type: ..... Drawbar

Tires (12 - 18 disc blades): ..... 11L 15 - 12 ply

Tires (12 - 28 disc blades): ..... 400/60 - 14 ply

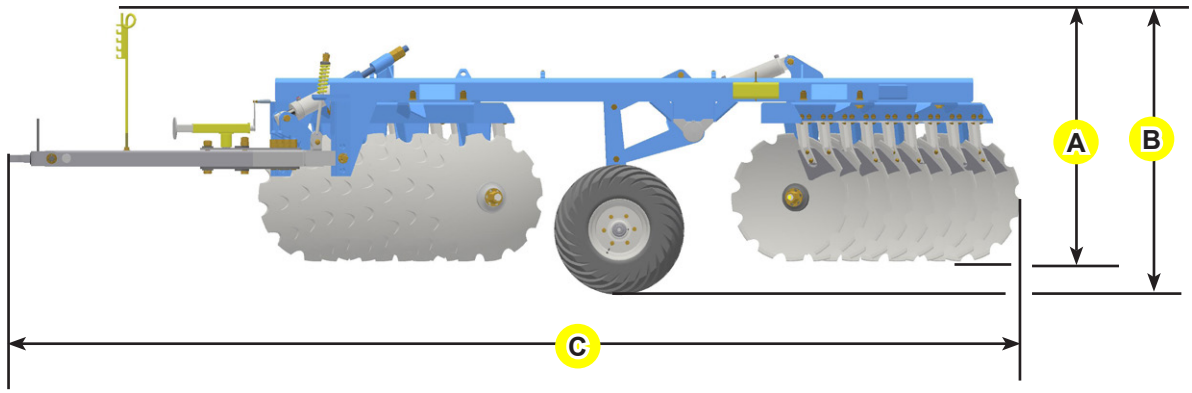
Working speed: .....5 to 7 km/h

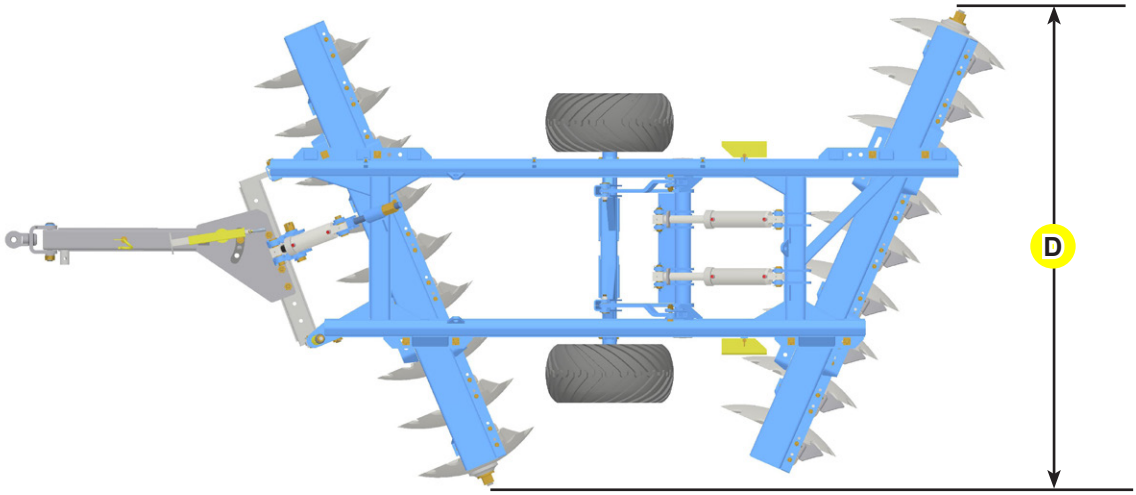
Model	Number of disc blades	Cutting width (mm)	Disc blades		Total weight (Kg)	Tractor required (cv)
			Dimensions	Spacing		Wheels
GAPCR 360	12	1980	32" x 9 mm 34" x 9 mm or 34" x 12 mm	360 mm	2848	130 - 150
	14	2340			3323	150 - 170
	16	2700			3854	170 - 190
	18	3060			3995	190 - 210
	20	3420			4717	230 - 250
	22	3780			4924	250 - 270
	24	4140			5210	270 - 290
	28	4715			6380	310 - 350

NOTE

- **The weights above were obtained using Ø 34" x 9 mm disc blades.**
- **For other adjustments, consult the factory.**

Dimensions for transportation and storage





Model	Number of disc blades	A	B	C	D
GAPCR 360	12	1650	1870	4790	2200
	14	1650	1870	5470	2560
	16	1650	1870	6150	2900
	18	1650	1870	6830	3240
	20	1823	2000	7510	3580
	22	1823	2000	8190	3920
	24	1823	2000	9100	4350
	28	1823	2000	9780	4690

NOTE Measures in millimeters.

GAPCR 360 (12 to 18 disc blades) - with stabilizer bar

01 - Frame

02 - Front disc gang

03 - Rear disc gang

04 - Wheelset

05 - Hose support

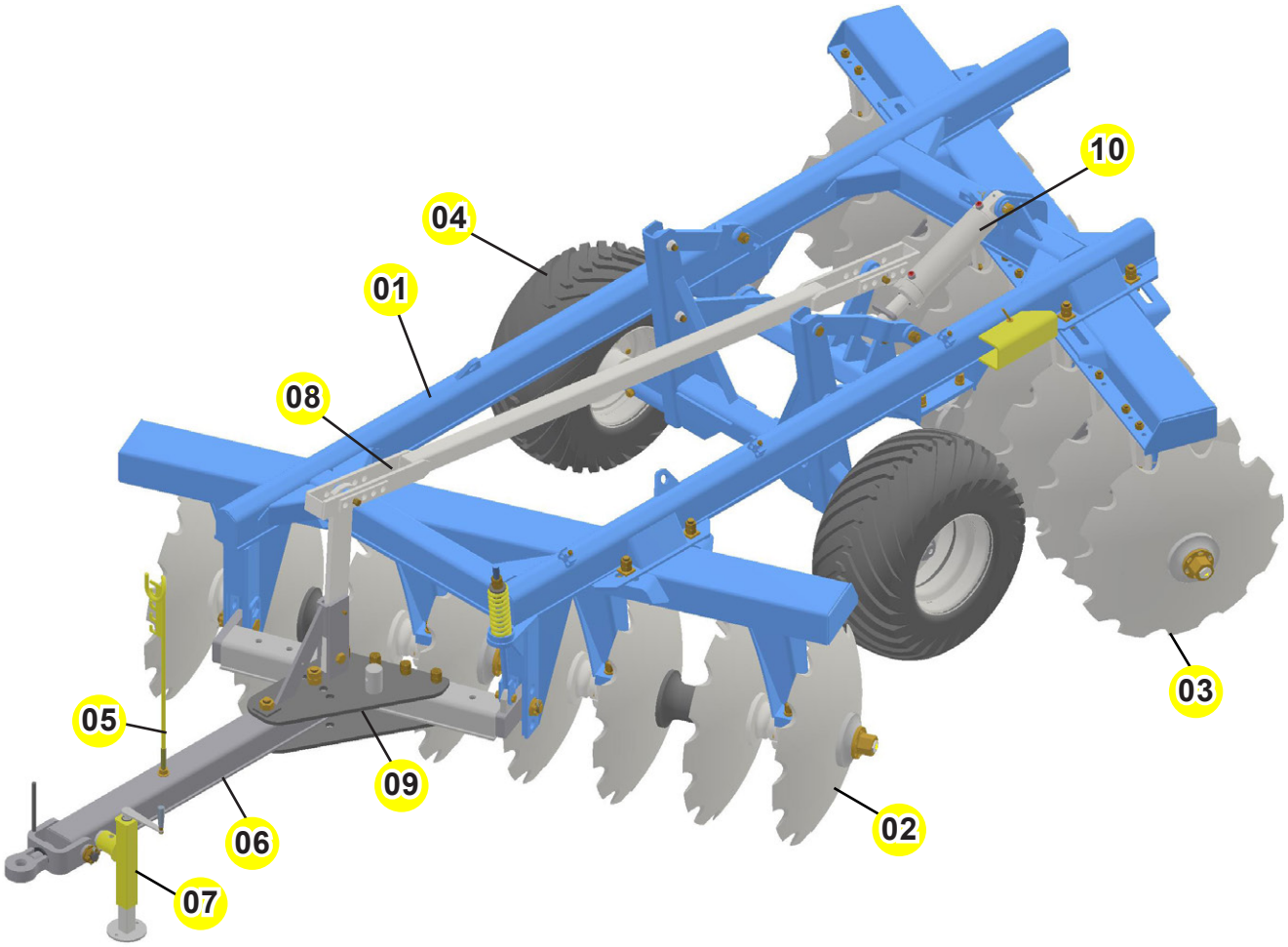
06 - Drawbar

07 - Jack

08 - Stabilizer bar

09 - Hitch bar

10 - Hydraulic cylinder



GAPCR 360 (12 - 18 disc blades) - with cylinder on drawbar for leveling

01 - Frame

02 - Front disc gang

03 - Rear disc gang

04 - Wheelset

05 - Hose support

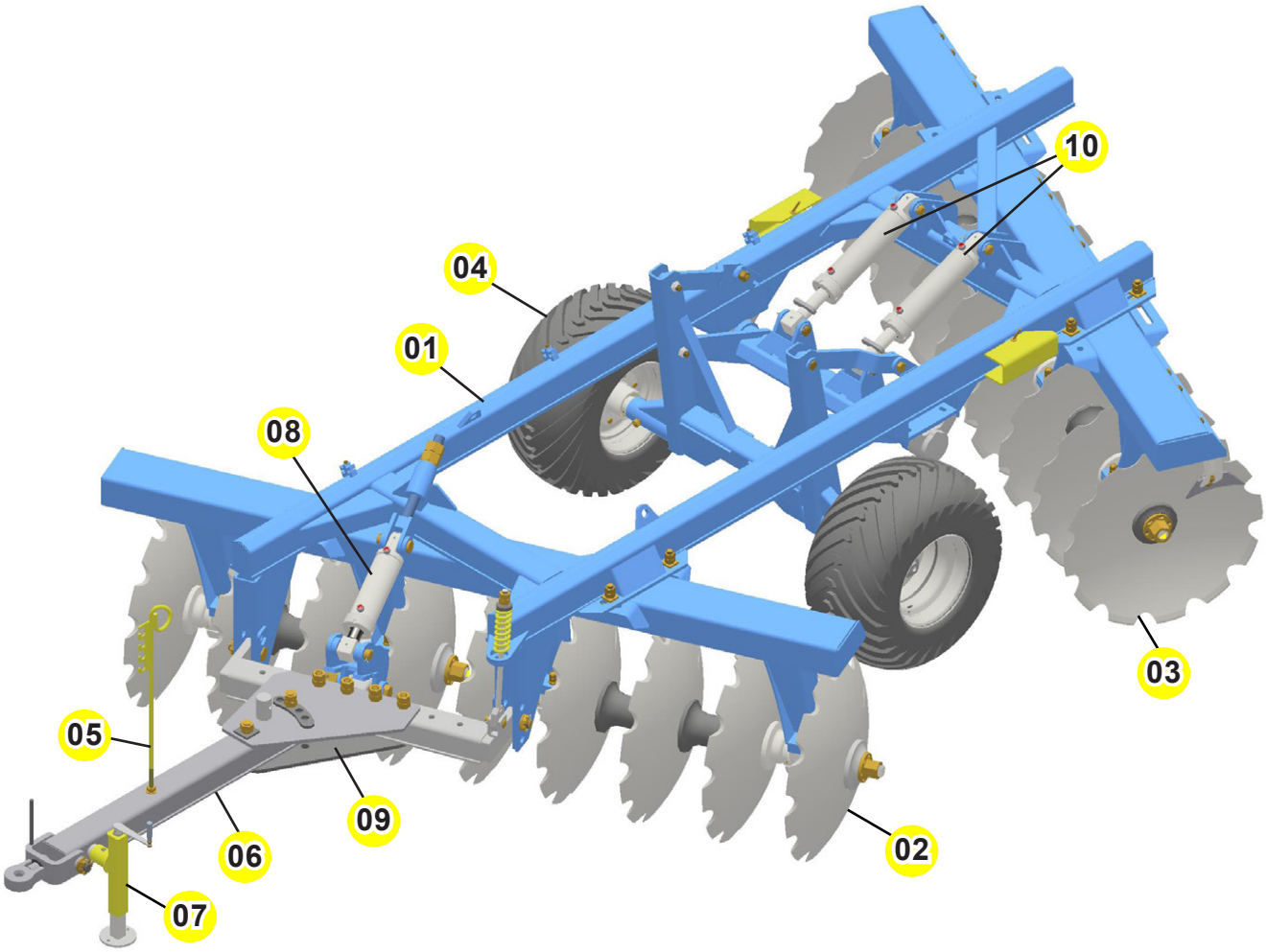
06 - Drawbar

07 - Jack

08 - Drawbar articulation

09 - Hitch bar

10 - Hydraulic cylinder



GAPCR 360 (20 to 28 disc blades) - with stabilizer bar

01 - Frame

02 - Front disc gang

03 - Rear disc gang

04 - Wheelset

05 - Hose support

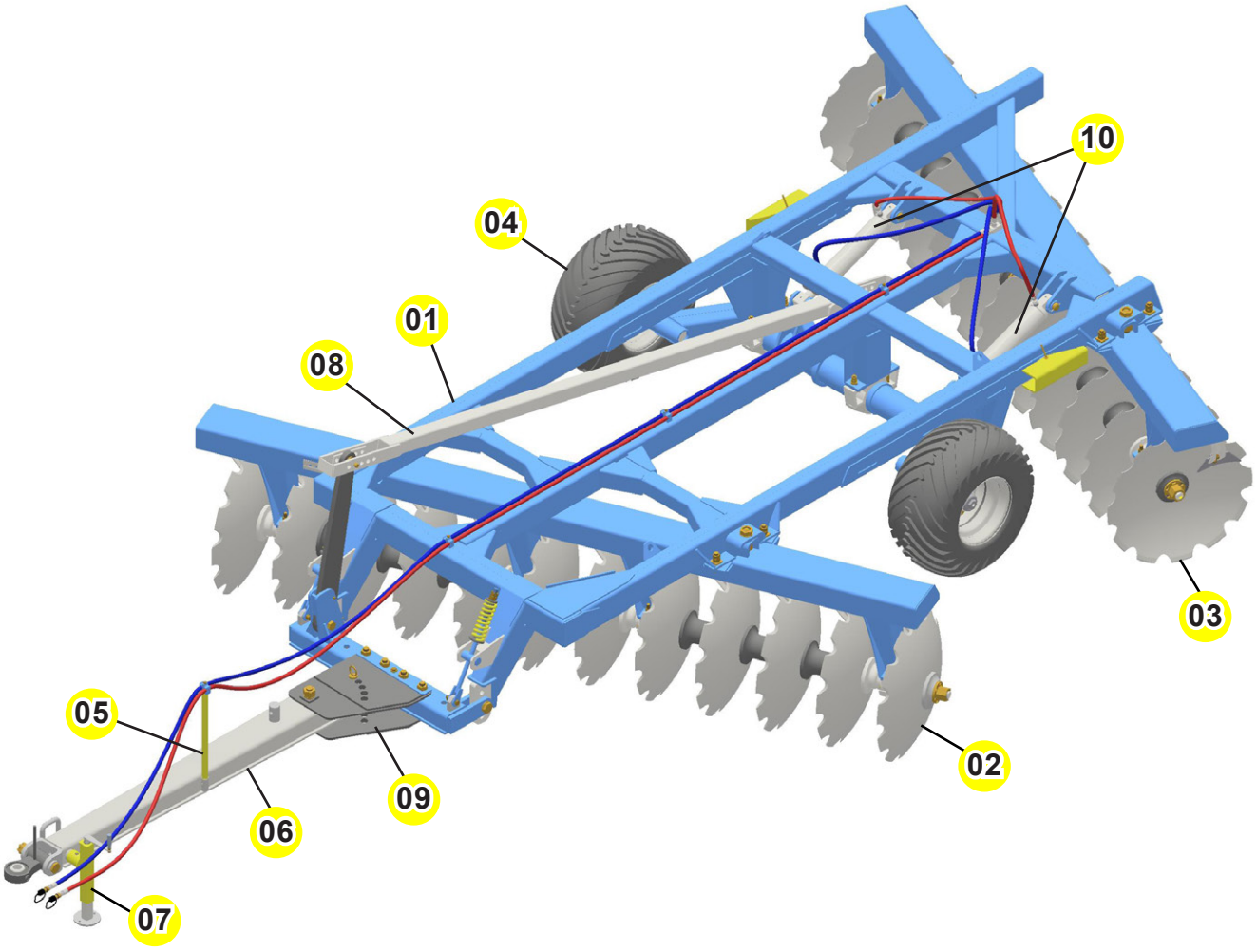
06 - Drawbar

07 - Jack

08 - Stabilizer bar

09 - Hitch bar

10 - Hydraulic cylinder



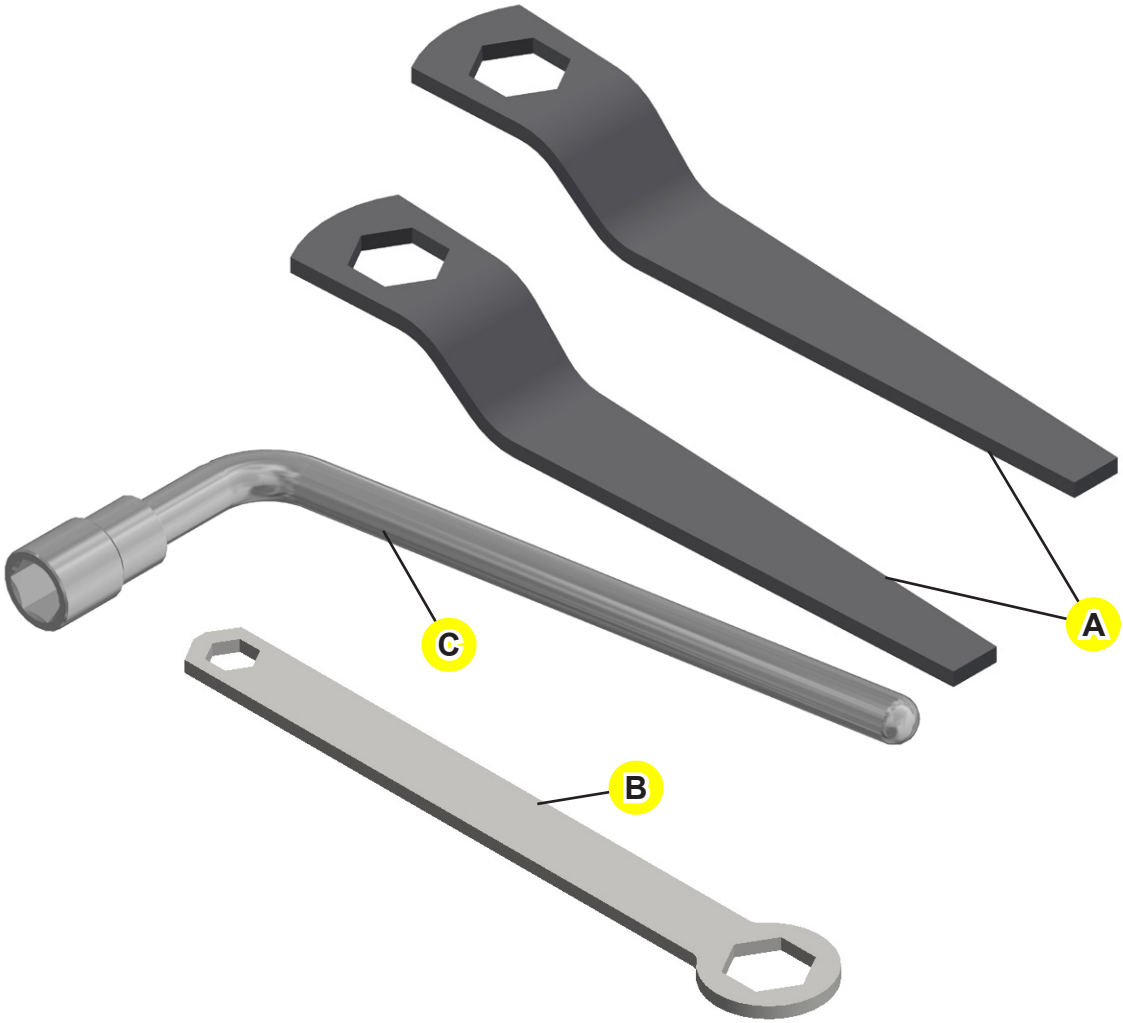
First of all, put the parts in a clean place to identify them easier. Check the parts using the list that comes inside the packing box.

Using the set of wrenches

• Use two box end wrenches (A) to tighten the nuts of the disc gang, being one to hold the axle nut on one side while the other tighten the nut to the other end, thereby preventing the axle from rotating.

• The box end wrench (B) is used to tighten the nuts on the traction set.

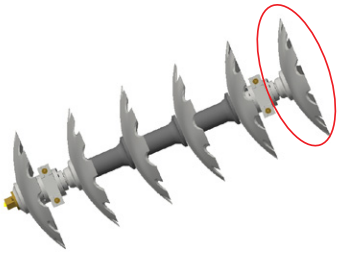
• The box end wrench (C) is used to tighten the nuts of the bearing bolts.



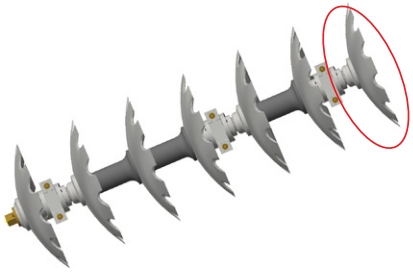
NOTE **We recommend wearing gloves, especially while assembling the disc gangs.**

Assembly of bearings and spacer spools

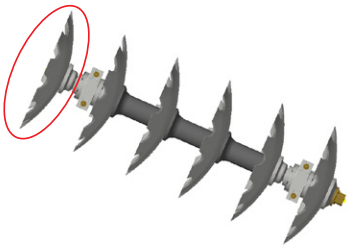
Before starting to assemble the disc gangs, check the correct position of the bearings and spacer spools, according to the following pages.

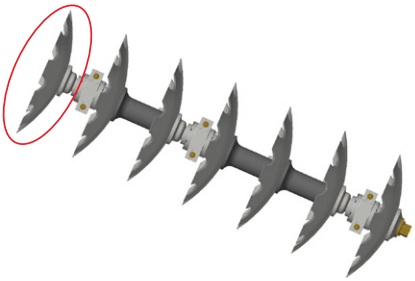


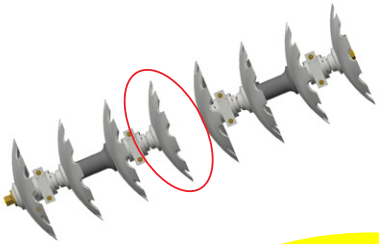
12 disc blades
04 bearings
06 spacer spools



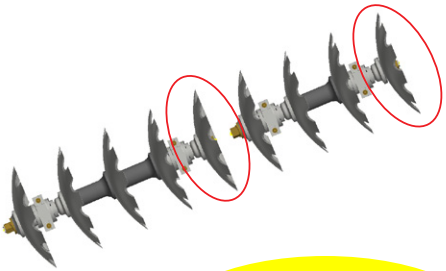
14 disc blades
06 bearings
06 spacer spools



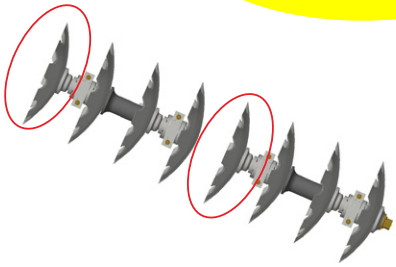


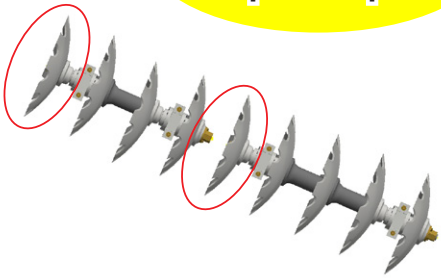


16 disc blades
08 bearings
04 spacer spools



18 disc blades
08 bearings
06 spacer spools



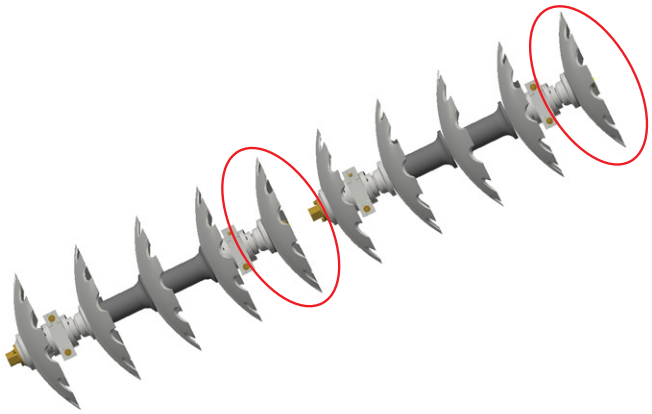


Bearing

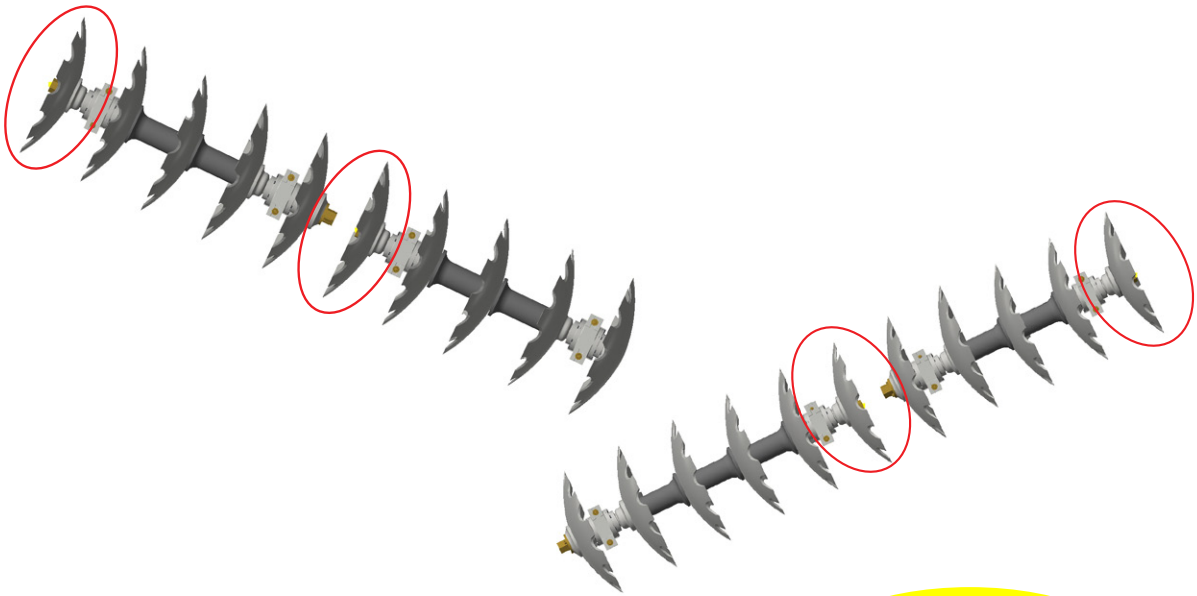
Spacer spool

Shim

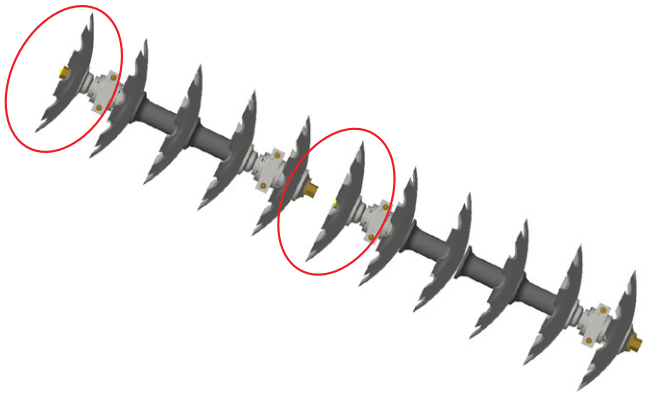
Assembly of bearings and spacer spools



20 disc blades
08 bearings
08 spacer spools

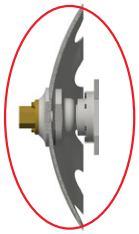


22 disc blades
08 bearings
10 spacer spools



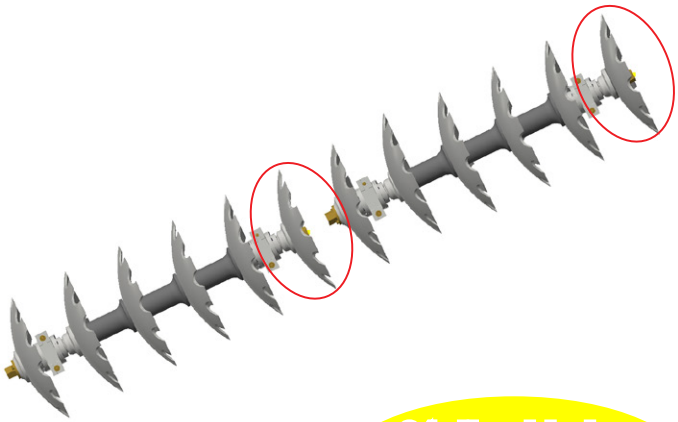
Spacer spool

Bearing

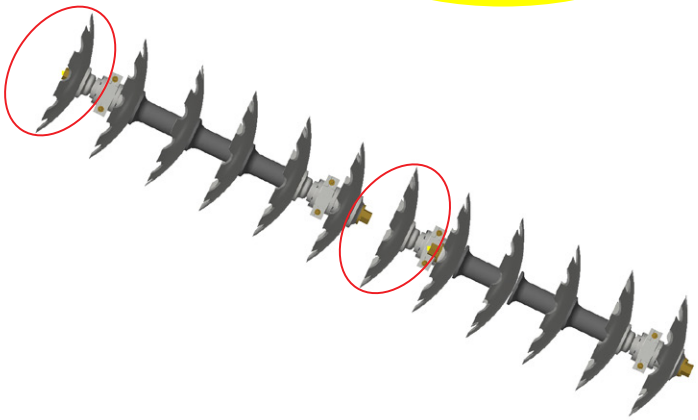


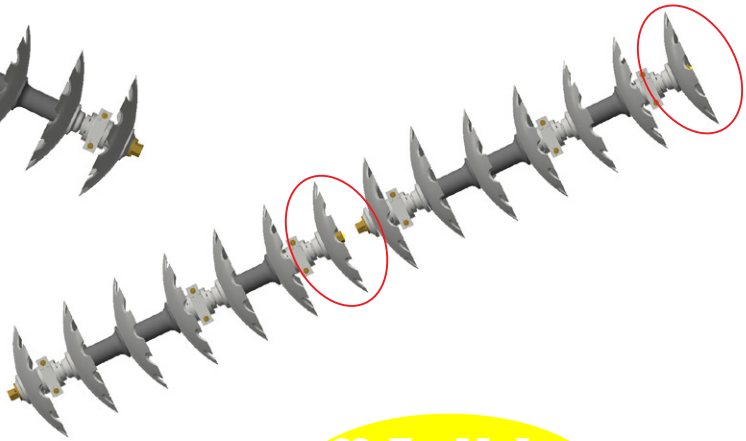
Shim

Assembly of bearings and spacer spools

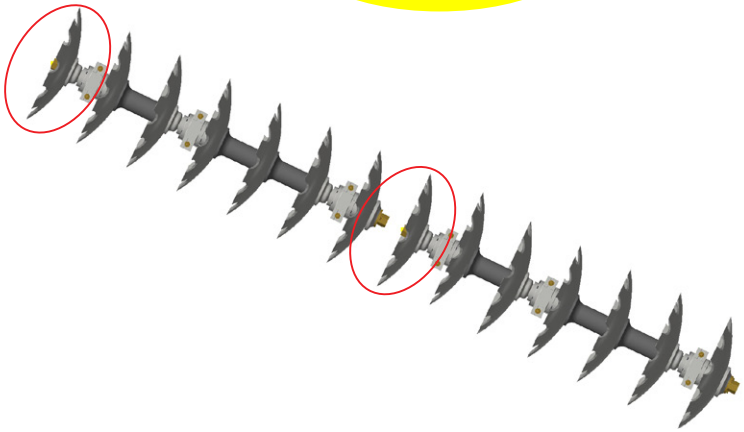


24 disc blades
08 bearings
12 spacer spools



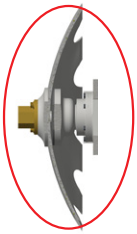


28 disc blades
12 bearings
12 spacer spools



Spacer spool

Bearing



Shim

Disc gangs assembly sequence

Place the inner lock (A) along with the axle (B).

Then, tighten the nut (C) until it pass 5 mm from the axle face.

Place the shims (D), disc blades (E), bearings (F) and spacer spools (G), following the illustrations on the previous pages.

Place the bolt (H), along with a flat washer and spring washer.

Use the wrenches (A) from the 'set of wrenches' page to tighten the gangs as follows:

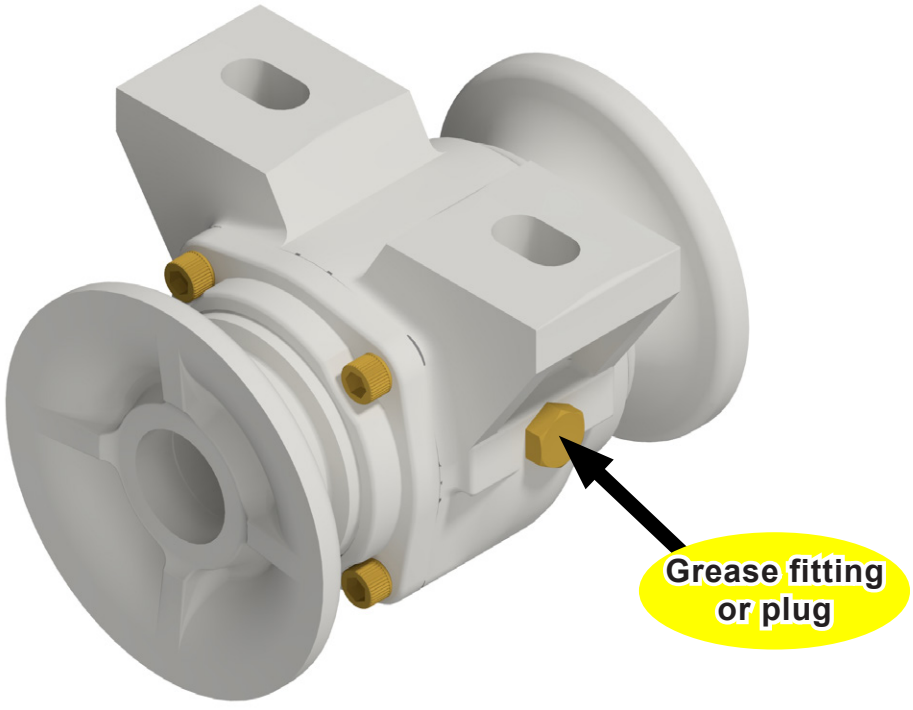
1) Place one of the wrenches on the outer side of the gangs (locked side), supporting it on the ground, as shown on the next page.

2) On the inner side, use the other wrench and tighten the gangs until the maximum torque is achieved.

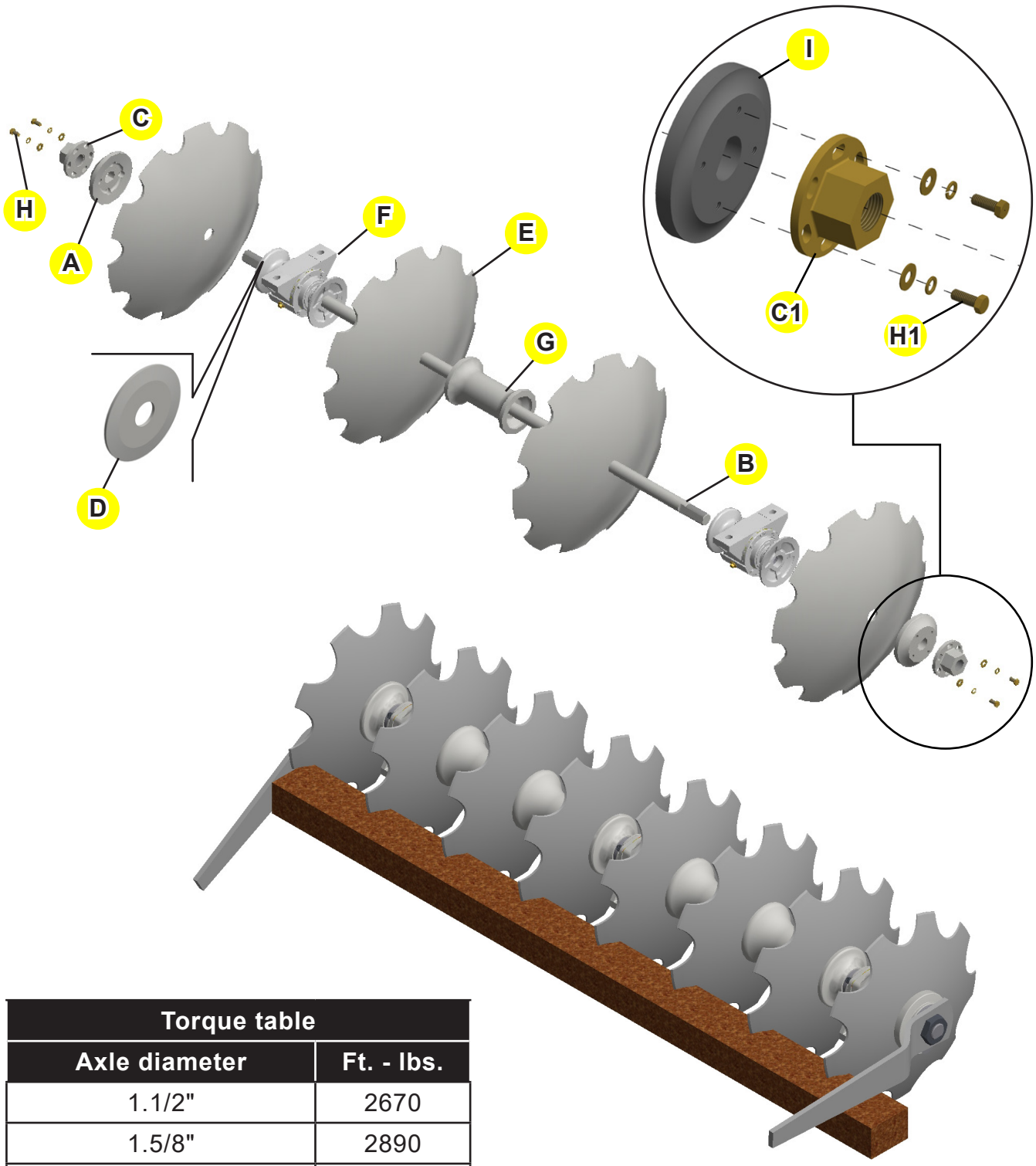
3) To tighten the gangs, underpin them using a piece of wood or another object, thereby preventing their movement. (As shown on the next page).

Lastly, place the bolt (H1) and position the lock nut (I1), fastening with a spring washer and nut.

IMPORTANT **Check the correct side of the bearings and spacer spools according to the concavity of the disc blades.**



Disc gangs assembly sequence



Torque table	
Axle diameter	**Ft. - lbs.**
1.1/2"	2670
1.5/8"	2890
1.3/4"	3020
2"	3150
2.1/8"	3300
2.1/2"	3500
3"	4000

NOTE **The axle (B) threads must be cleaned and greased before their assembly. Check the torque table page on the 'important data' section.**

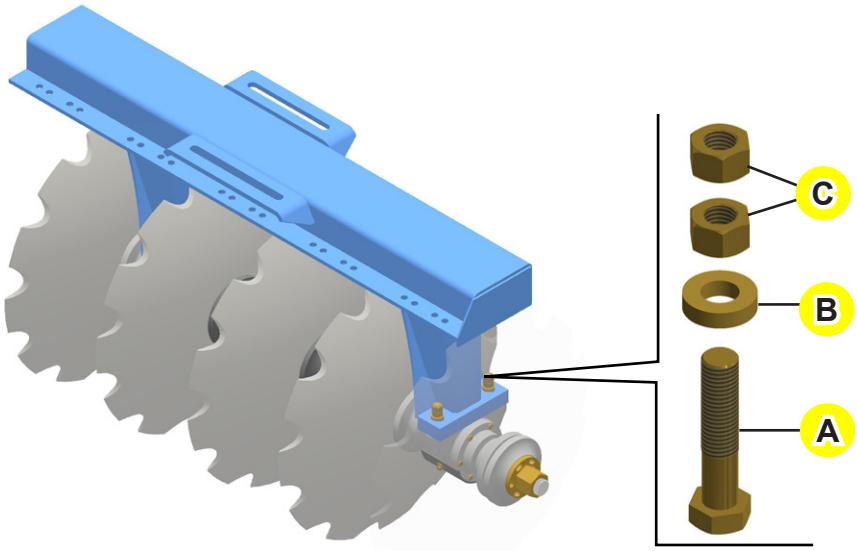
Assembly of the disc gangs on the frame

IMPORTANT **The rear gang turns earth to the left and the front gang turns earth to the right.**

In the gang assembly to the carriers, the bearing hangers should remain facing the disc blades concavity.

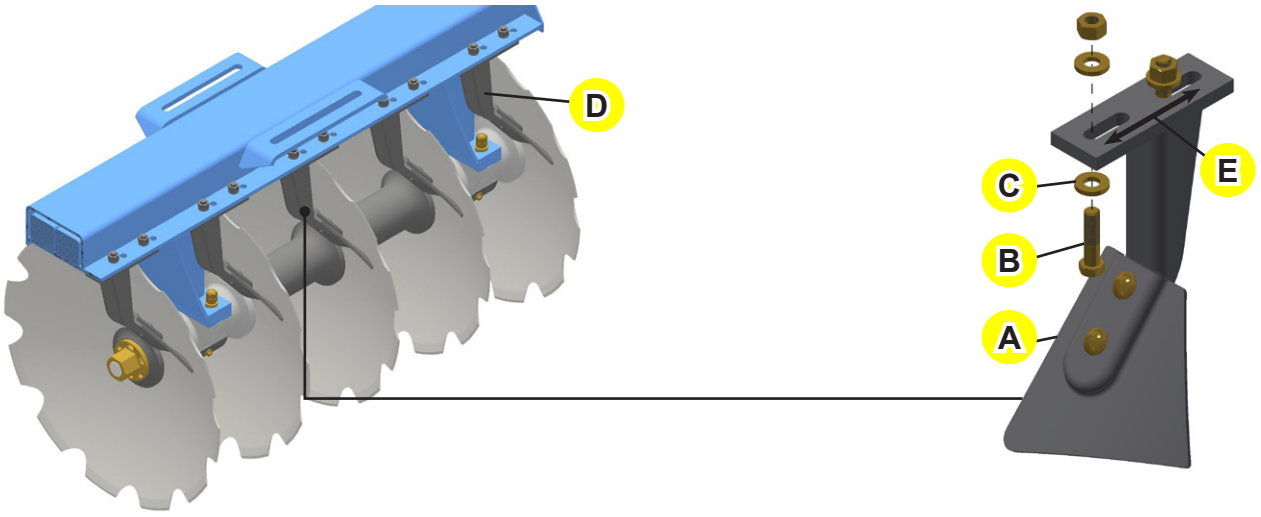
Place the bolts (A) passing through the bearing and through the bearing hanger hole. On top, place a flat washer (B), nuts and counternuts.

Repeat this operation for the other bearings.



Scrapers assembly

Note the fixing points of the scrapers with the end facing the concave side of the disc blades. Assemble the scrapers (A) using bolts (B) and flat washer (C). The bolt (B) is placed underneath the fixation plate (D). On top, place another flat washer and nut.

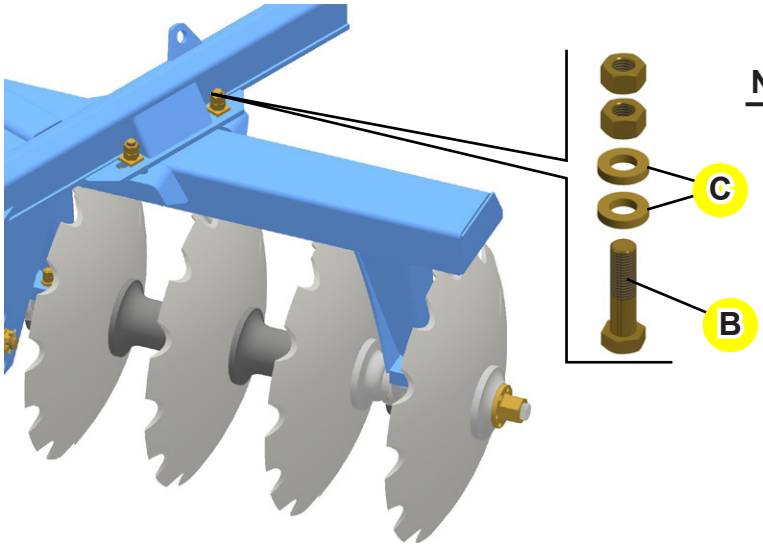


NOTE **The scrapers feature an adjustment to approach or distance them from the disc blades, on a range from 5 to 10 mm.**

Assembling the disc carrier to the frame

Fasten the disc carrier (front and rear) to the frame (A) using bolts (B), flat washers (C) and nuts.

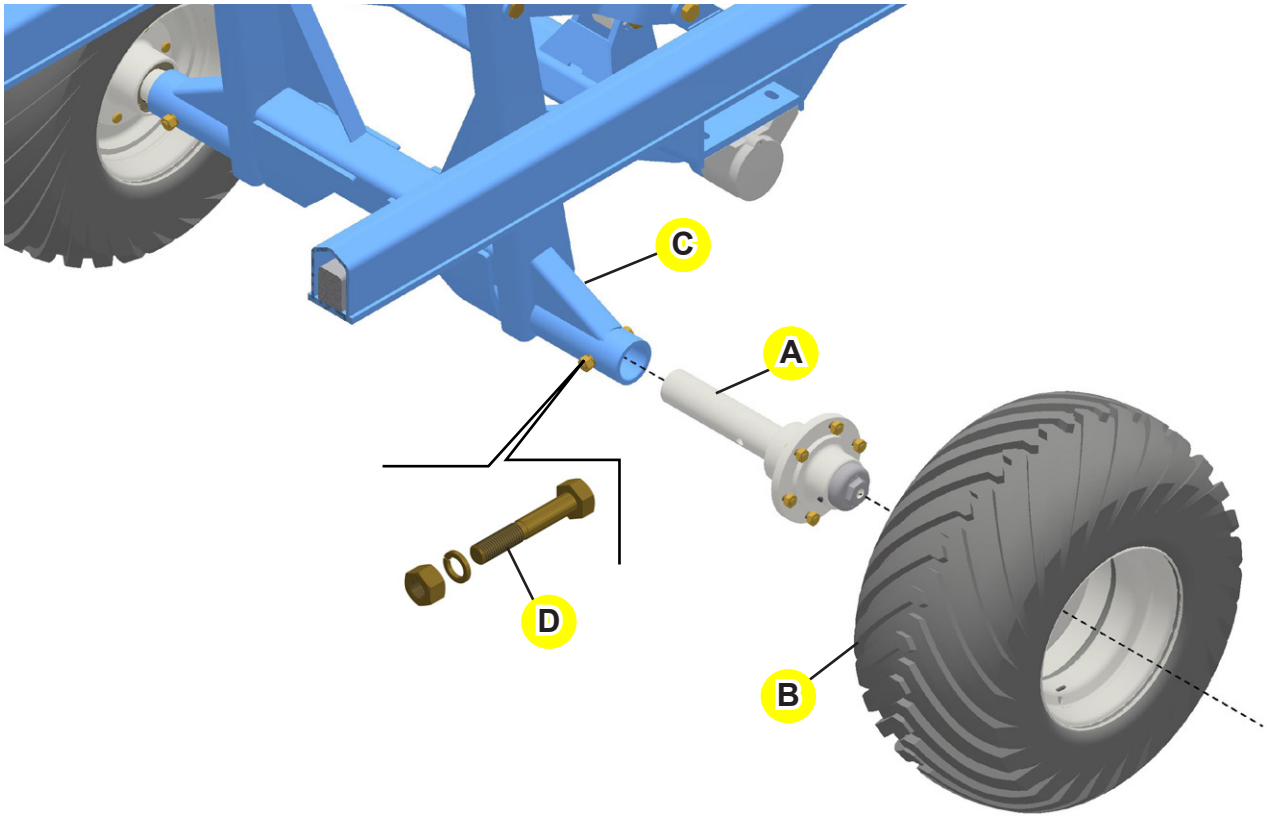
Note that the bolts (B) are placed from bottom to top.



NOTE **For the models that have 12 - 18 disc blades, use round flat washers (C). For the models that have 20 - 28 disc blades, use square flat washers.**

Tires assembly

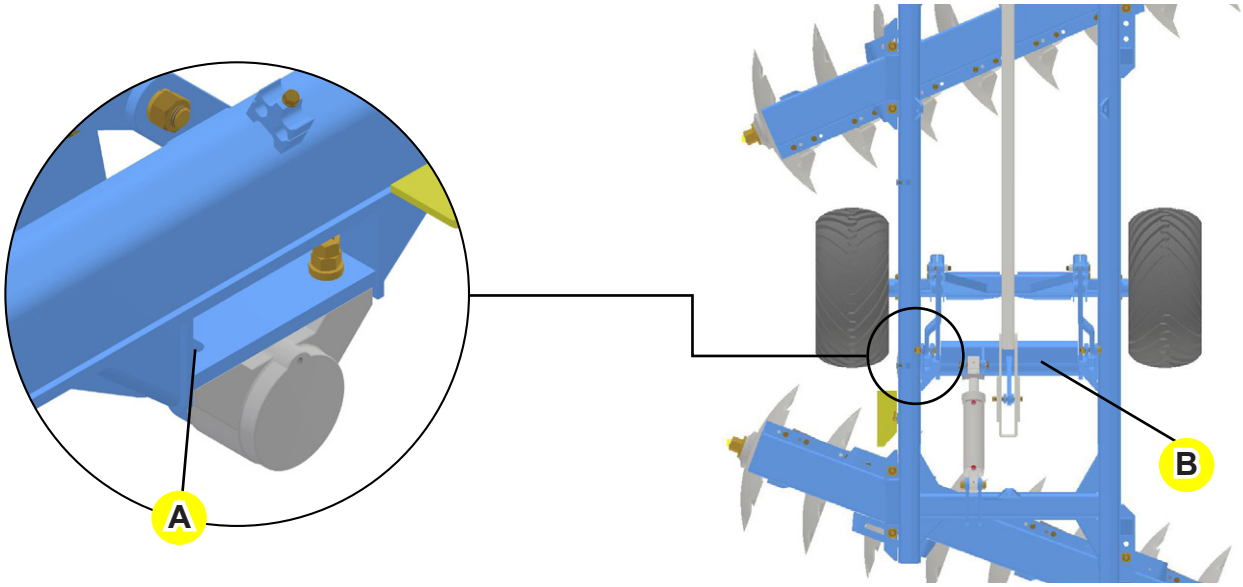
Lock the hub (A) to the wheel (B) using bolts and the hub nut (A). Right after, fasten the hub with wheel to the wheelset support (C) using a bolt (D), spring washer and nut.



Wheelset bearings adjustment

The GAPCR 360 allows adjustments on the wheelset bearings through slots (A). This adjustment is done to centralize the wheelsets with the harrow structure and to eliminate lateral gaps between the articulation axle and the bearings.

Adjust the bearings centralizing the wheelset with the frame. Note that the tires must have the same distance in relation to the frame. The wheelset axle (B) should be without inner gaps against the bearings.

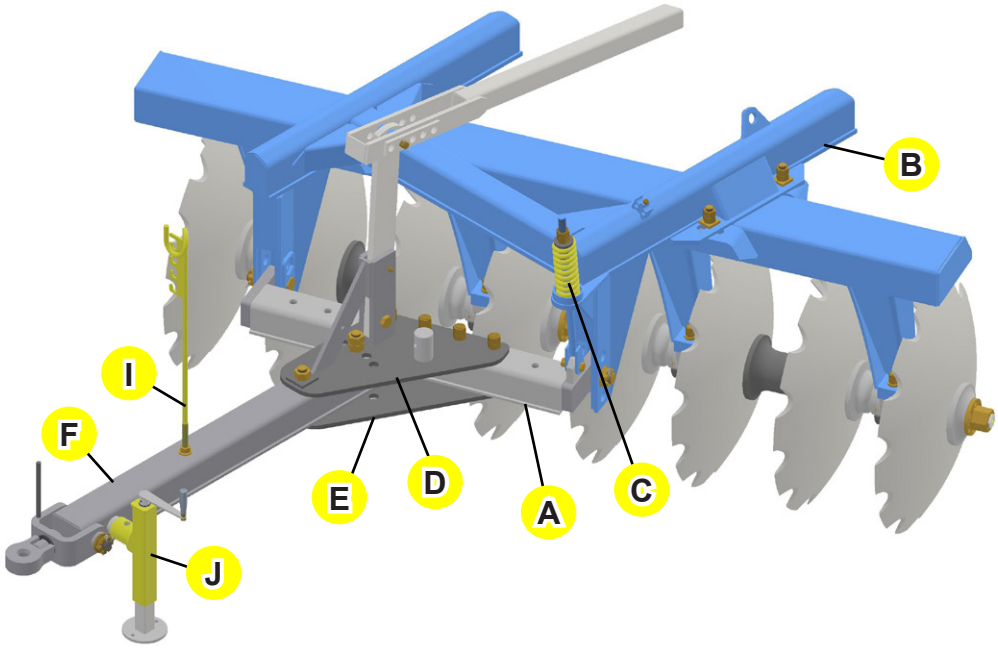


Hitch bar assembly - 12 to 18 disc blades with bar

Couple the drawbar (A) to the frame (B) and shank (C).

Assemble the upper (D) and lower (E) plates, carefully observing their correct positions. Avoid to assemble them inverted.

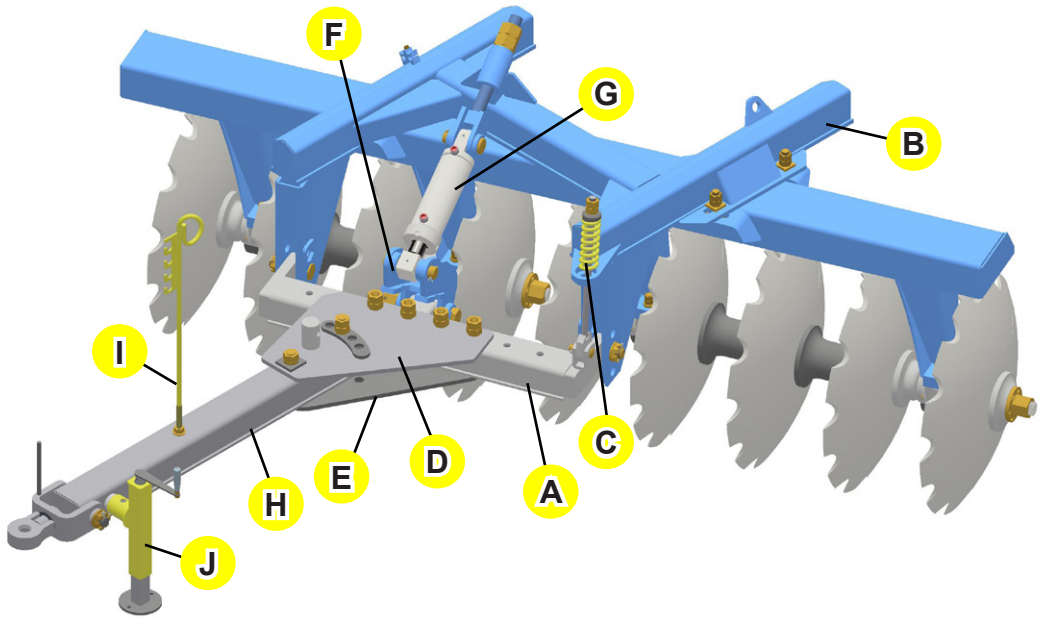
Lock the drawbar (F) and note that the nuts will be on the upper plate.



Hitch bar assembly - 12 to 18 disc blades with cylinder

Couple the hitch bar (A) to the frame (B) and to the spindle (C).

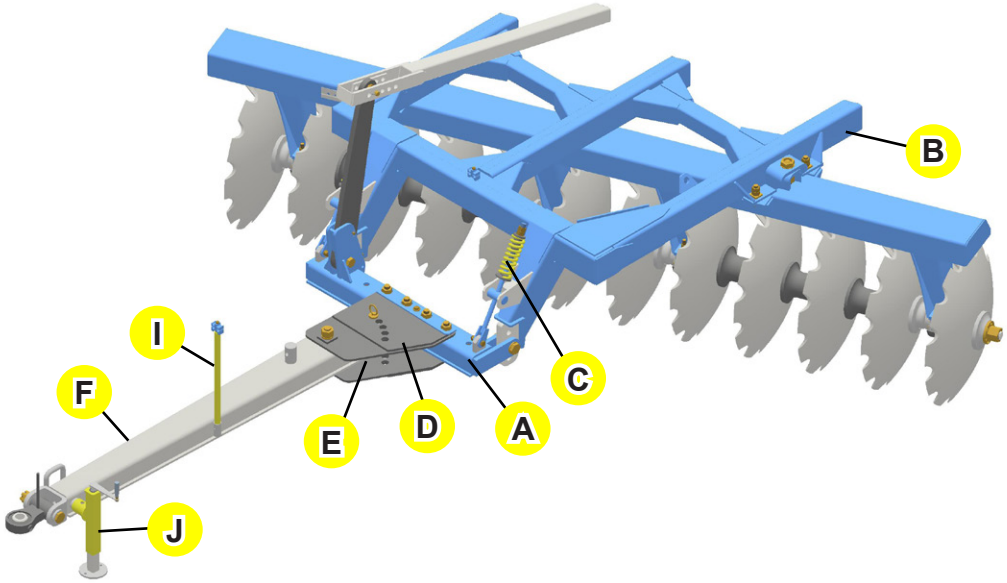
Assemble the upper plate (D) and the lower one (E), carefully observing their correct position. Avoid to assemble them inverted. Lock the articulator (F) to the hitch bar (A) and the cylinder (G) right after. Fasten the drawbar (H) and note that the nuts will be on the upper plate.



Hitch bar assembly - 12 to 18 disc blades with cylinder

Couple the hitch bar (A) to the frame (B) and to the spindle (C).

Assemble the upper (D) and lower (E) plate, carefully observing their correct position. Avoid to assemble them inverted. Fasten the drawbar (F) and note that the nuts will be on the upper plate.



Assemble the hose support (I) on the drawbar using a nut and washer for the models with 12 - 18 disc blades; use a cotter pin for the models with 20 - 28 disc blades.

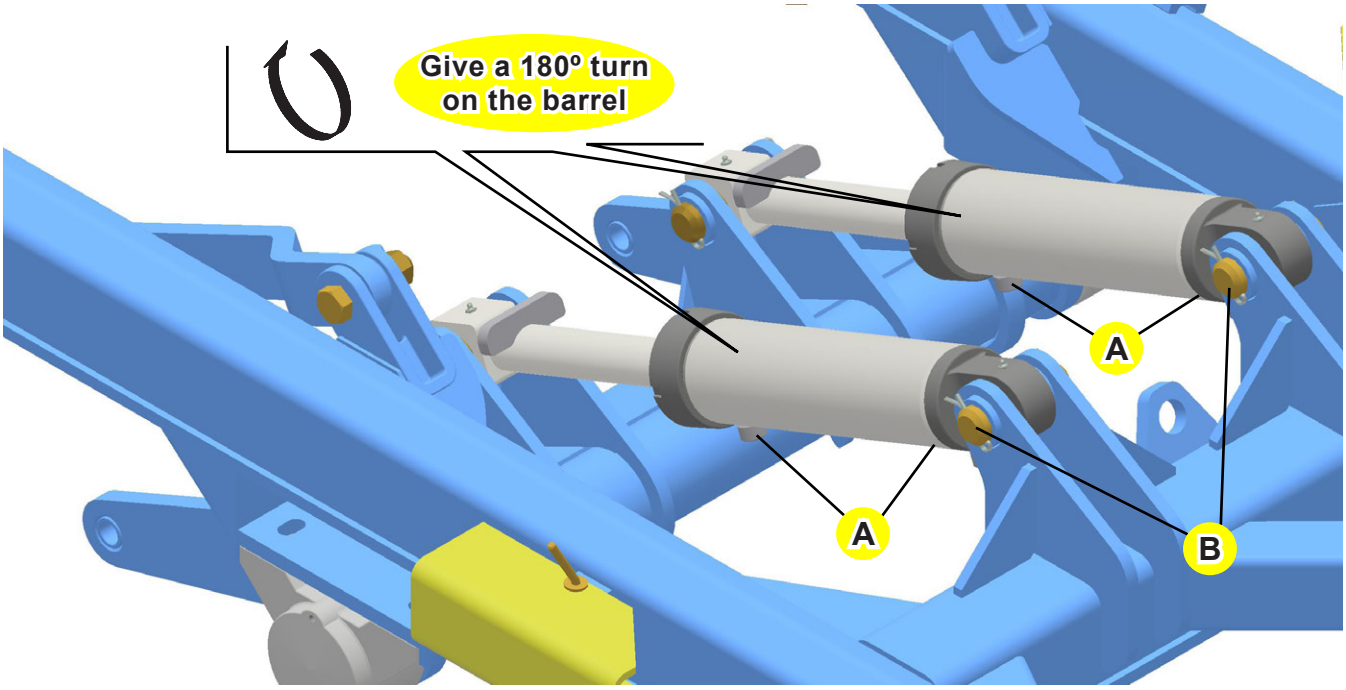
Couple the jack (J) using a pin and cotter pin.

Hydraulic cylinder assembly

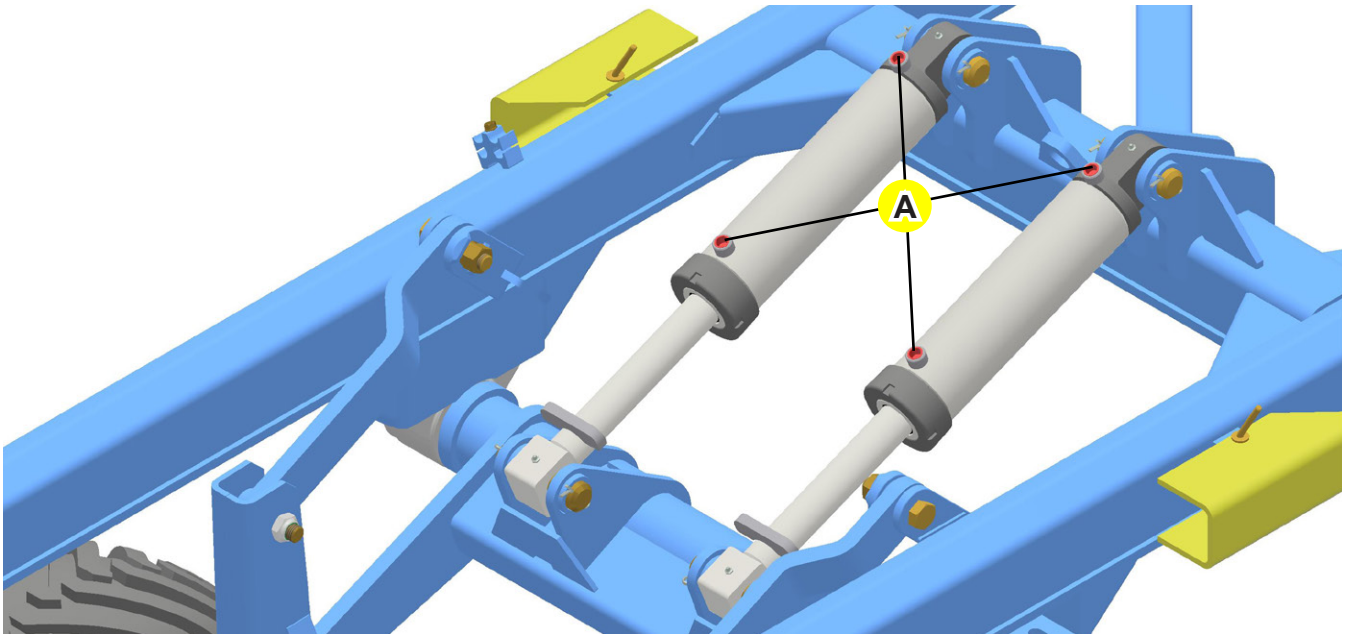
Protecting the ports:

The cylinder ports (A) are delivered to the owner facing down in order to protect them.

To return the cylinder ports to their correct position, loosen up the pin (B) and cotter pins, letting the cylinder barrel free.



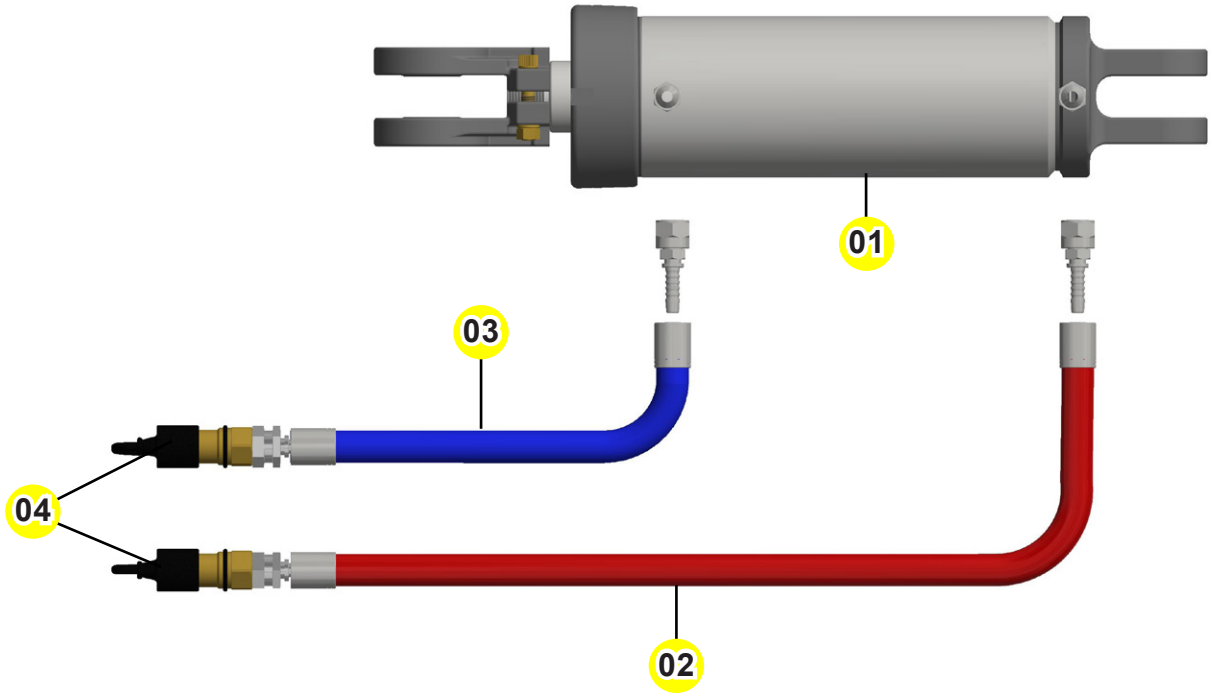
Give a 180° turn on the cylinder barrel to let the ports (A) facing up.



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

Hydraulic circuit assembly (12 - 18 disc blades)

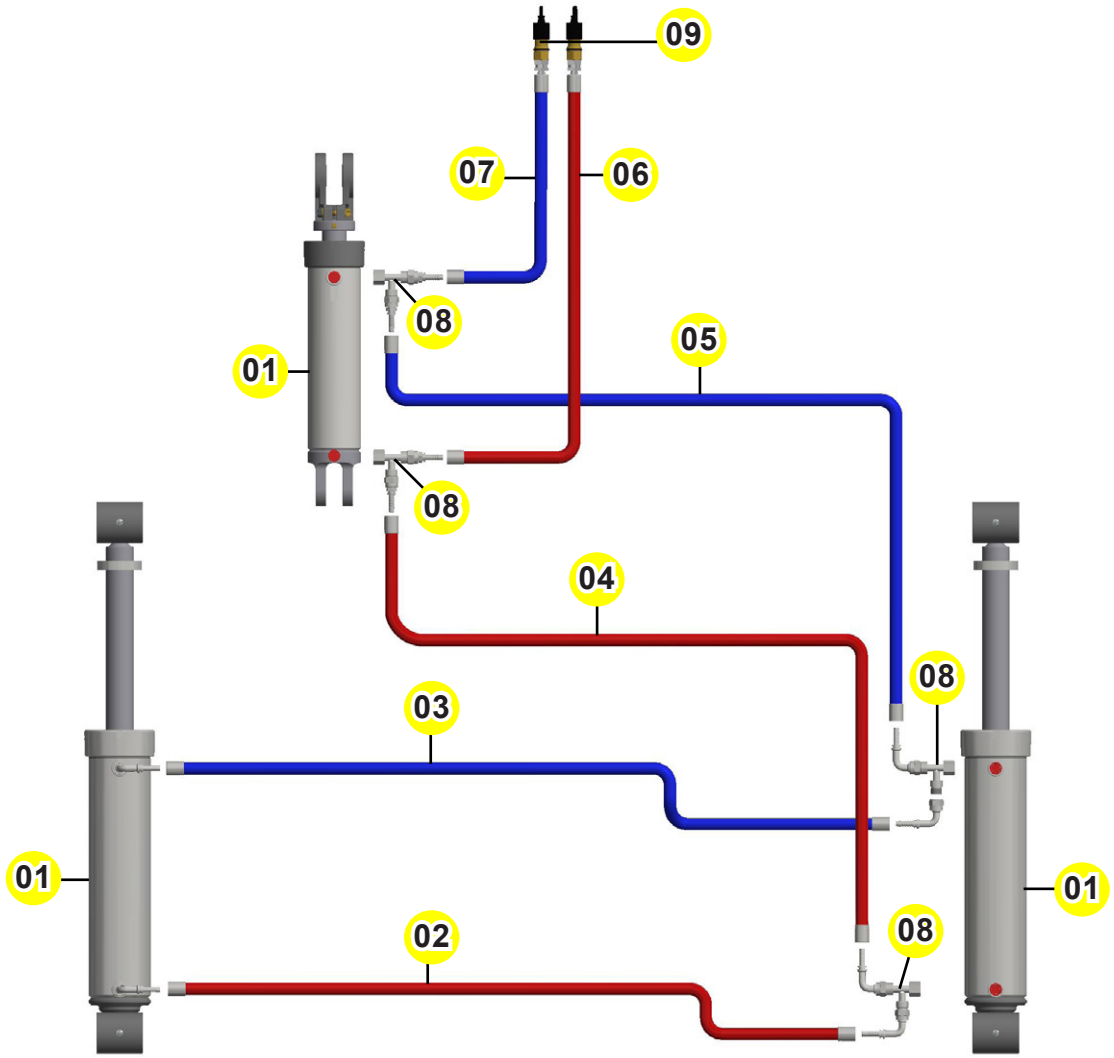
Assemble the hoses to the hydraulic cylinder with proper tightening and avoid that the terminals touch the soil.



Item	Description		Quantity
01	Hydraulic cylinder		01
02	3/8 X 7200 TC-TM hose	Pressure	01
03	3/8 X 7200 TC-TM hose	Return	01
04	Male quick coupler		02

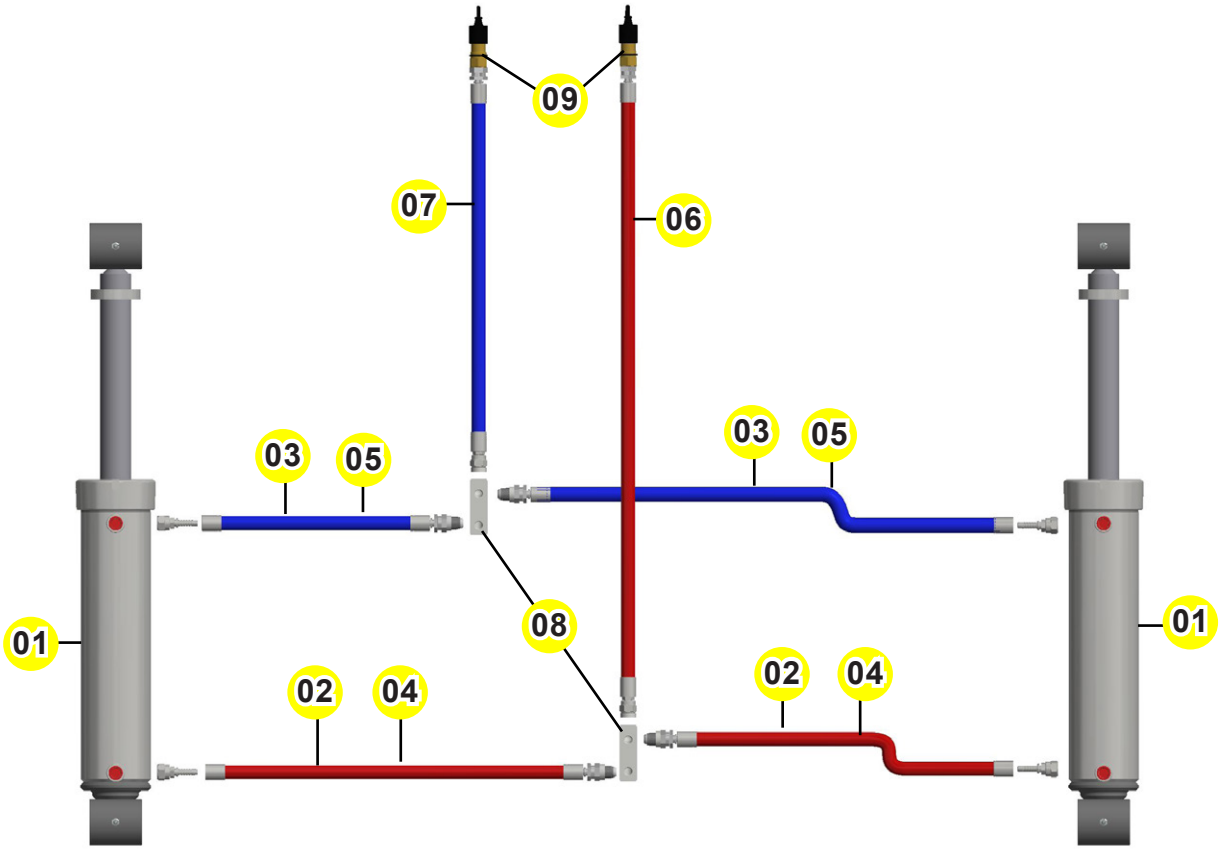
NOTE **The wheelset lifting cylinder rod must be facing the wheelset side.**

Hydraulic circuit assembly (12 - 18 disc blades) - with drawbar cylinder



Item	Description		Quantity
01	Hydraulic cylinder		03
02	3/8 X 700 TC-TC hose	Pressure	01
03	3/8 X 700 TC-TC hose	Return	01
04	3/8 X 3800 TR-TC hose	Pressure	01
05	3/8 X 3800 TR-TC hose	Return	01
06	3/8 X 3500 TR-TM hose	Pressure	01
07	3/8 X 3500 TR-TM hose	Return	01
08	T adapter with swivel nut		04
09	Male quick coupler		02

GAPCR 360 hydraulic circuit with cylinder on the drawbar



Item	Description		20 - 24	28
01	Hydraulic cylinder		02	02
02	3/8 X 1100 TR-TM hose	Pressure	02	-
03	3/8 X 1100 TR-TM hose	Return	02	-
04	3/8 X 1500 TR-TM hose	Pressure	-	02
05	3/8 X 1500 TR-TM hose	Return	-	02
06	3/8 X 7700 TM-TM hose	Pressure	01	01
07	3/8 X 7700 TM-TM hose	Return	01	01
08	Connection port		02	02
09	Male quick coupler		02	02

The following instructions must be carefully observed to get the best working performance.

Preparing the tractor

The addition of ballast water in the tires and a set of weights on the front part and rear wheels of the tractor are the most used ways to increase the soil traction and give greater stability to the tractor. Check if the tractor is in full conditions before using it.

Preparing the disk harrow

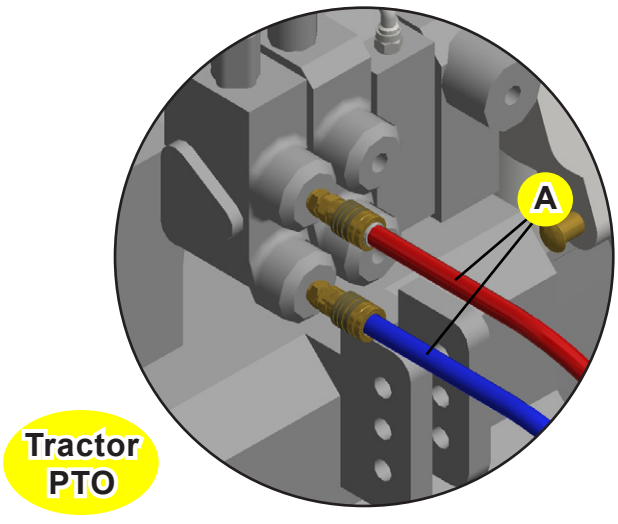
Check the condition of all parts and retighten nuts and bolts, especially the ones from the disc gangs. If the gangs work loose, they may damage the axle and other components.

Check the tires inflation and keep the same pressure on both of them.

Lubricate all grease fittings appropriately. (See the instructions on the 'lubrication' section).

Hitching to the tractor

Approach the tractor and couple the hoses (A) to the quick couplers. To do so, shut down the engine, relieve the control valve pressure by activating the lever a couple of times and check if the quick couplers are clean.

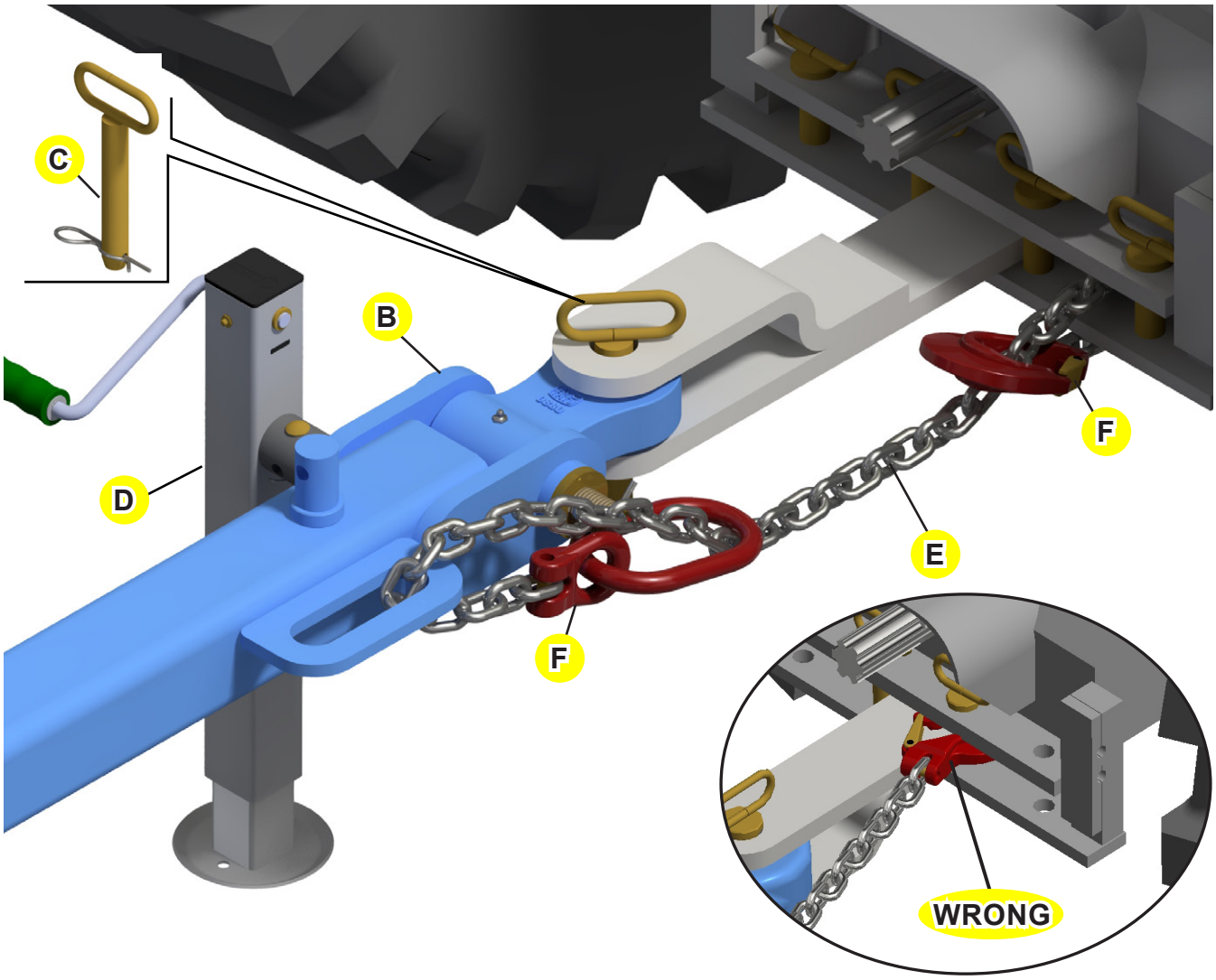


Couple the drawbar (B) to the tractor drawbar using an axle (C). Note that the drawbar is centralized on the tractor. To facilitate hitching, use the jack (D) adjustment.

For the models with 20 - 28 disc blades, lock the chain (E) to the equipment and tractor to assure that they will not get loose, but leave a small clearance so that the disk harrow can perform maneuvers.

Hitching to the tractor

NOTE The correct way to hitch the safety chain (E) may vary according to the tractor model. However, the hitch and the hoop must pass through the chain links as shown on the detail (F). Never hitch the hook without passing it through the chain.



ATTENTION Keep the drawbar locked during working and transportation.

During transportation, the lower hydraulic arms must remain adjusted.

Never remove the hoses before lowering the disk harrow and before relieving the control valve pressure.

Important recommendations

The tractor drawbar must remain loose during working and transportation.

Before removing the hoses, lower the harrow and relieve the control valve pressure.

The drawbar spring should be adjusted leaving 1 cm (one centimeter) of thread in the rod, above the nut and locknut. This adjustment should be maintained both in transport and work.

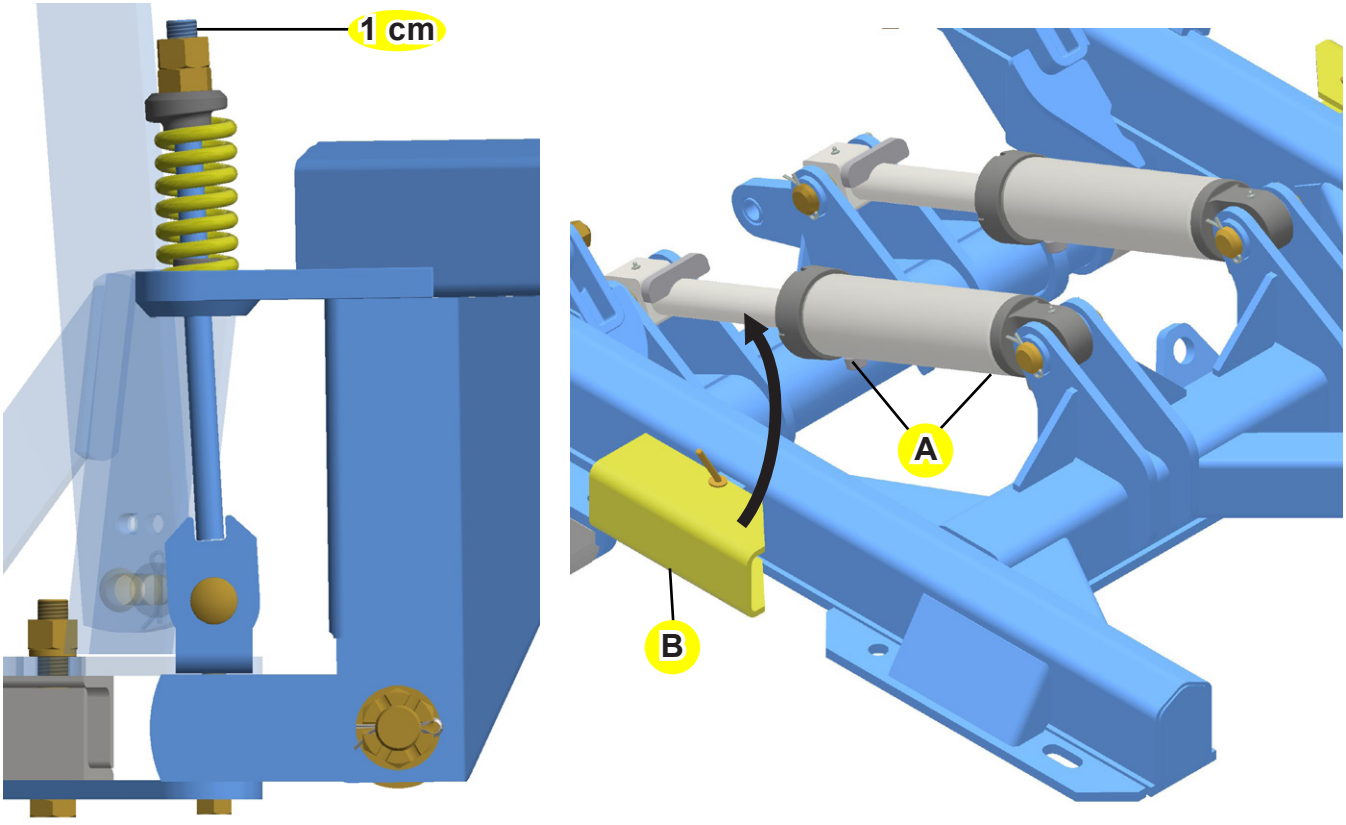
Lower the disk harrow until all the disc blades touch the ground. Adjust the nuts on the rod just to touch the spring guide, without compressing it. So, it is correctly adjusted both for work and transportation.

To protect the cylinder ports (A), they are delivered to the customer facing down.

Before starting to work, verify the conditions of all parts and retighten nuts and bolts, mainly the ones on the disc gangs, as damage to the axles and other components may occur if they work loose.

To transport the disk harrow over larger distances, it is necessary to use the transport lock (B) that is coupled on the hydraulic cylinder rod.

Lubricate all grease fittings appropriately. (See lubrication instructions).



NOTE **Note that the cylinder must remain as shown in the figure above, being its rod facing the disk harrow front.**

In case of using a tractor with a different drawbar height, it is necessary to redo these adjustments.

Whenever you place the lock, relieve the hydraulic cylinder pressure in a way that the lock stays pressed.

Cutting depth - Opening the disc gangs

The cutting depth can be adjusted in two ways:

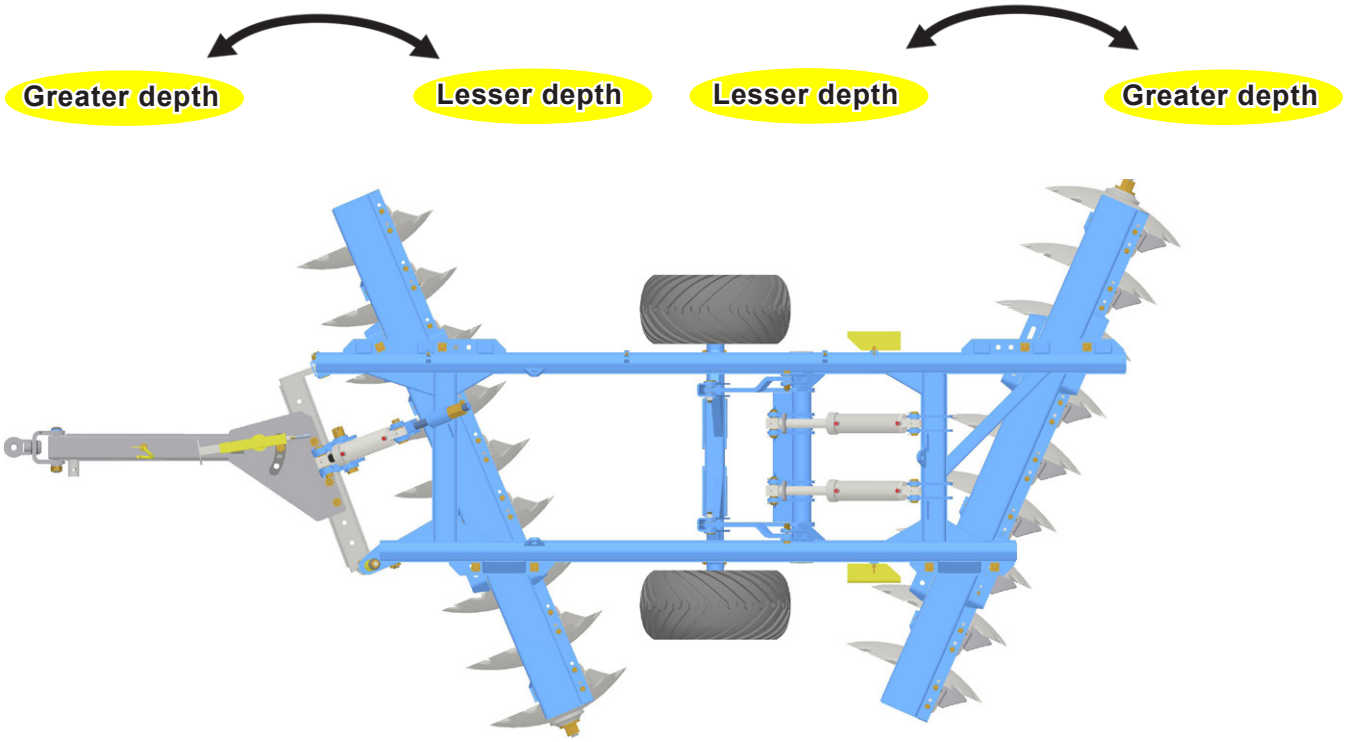
1) Adjust the opening angle (lock) of the disc gangs.

2) Activate the hydraulic cylinder so the tires will limit the depth.

NOTE **We recommend controlling the depth through the disc gangs opening and to use the tires only where the disk harrow penetrates excessively.**

The opening angle should increase between the gangs to work in soils with greater difficult to penetrate the disc blades. In light and loose soils, it is appropriate to work with a smaller opening angle.

This adjustment is done by changing the setting of the disc gang carriers on the main frame.



IMPORTANT **To start the harrowing, we recommend using an average opening on the disc gangs. If more penetration is needed, increase the opening angle of the rear disc gang.**

The front disc gang usually works with a smaller opening compared to the rear disc gang.

The harrowed ground is always on the left hand side of the operator (harrow closed side).

Try to make a good finish between the passes. Avoid the formation of furrows or untilled bands.

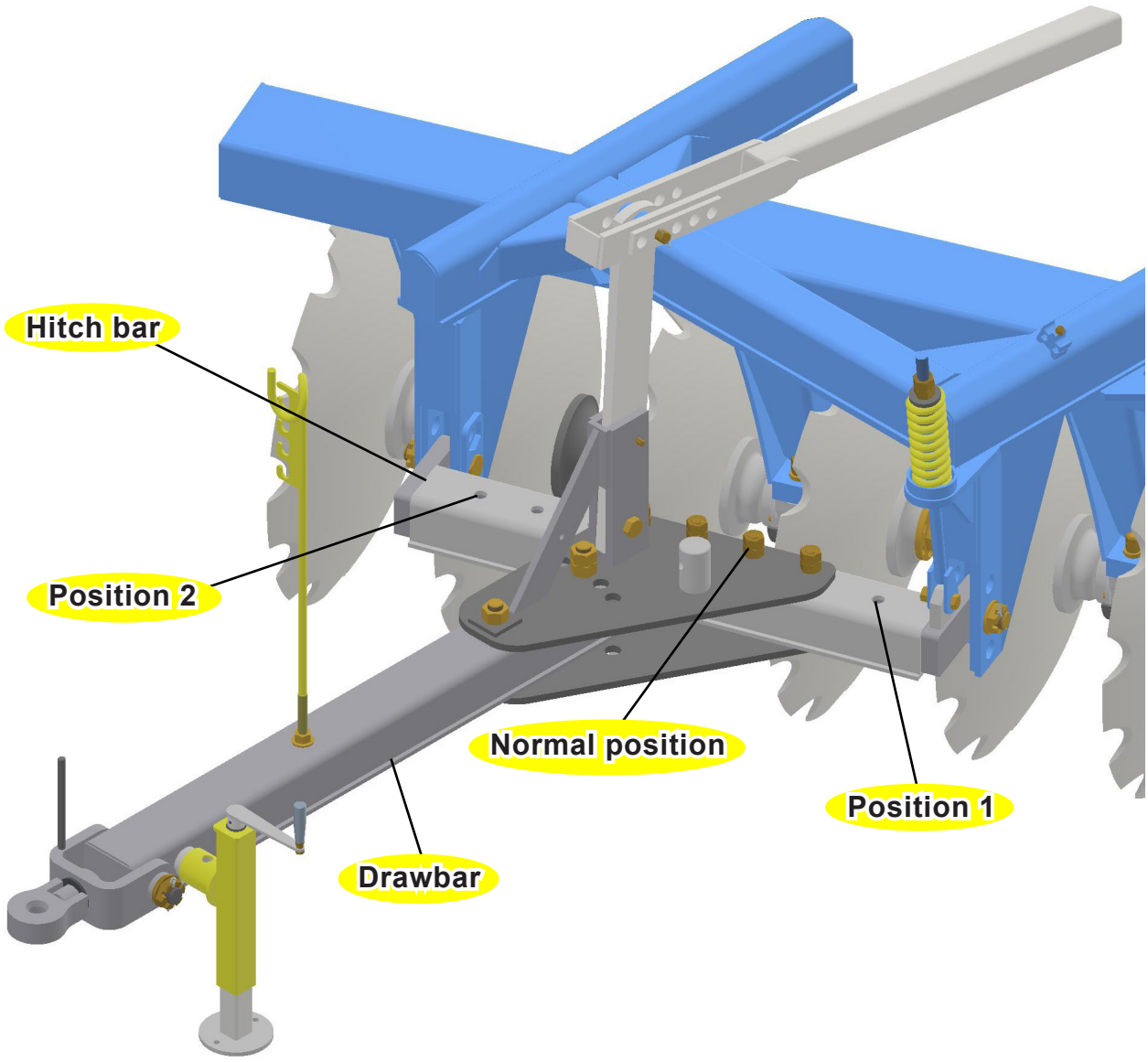
Tractor position related to the previous pass - Lateral displacement

The lateral displacement is used to better position the tractor regarding the previous furrow, avoiding leaving a trace and giving a reference to the operator.

This position is obtained according to the tractor gauge and cutting width of the harrow.

Whenever possible, the tractor should pass over the unworked soil and near the previous furrow.

The displacement is done by changing the drawbar in the hitch bar, as follows:

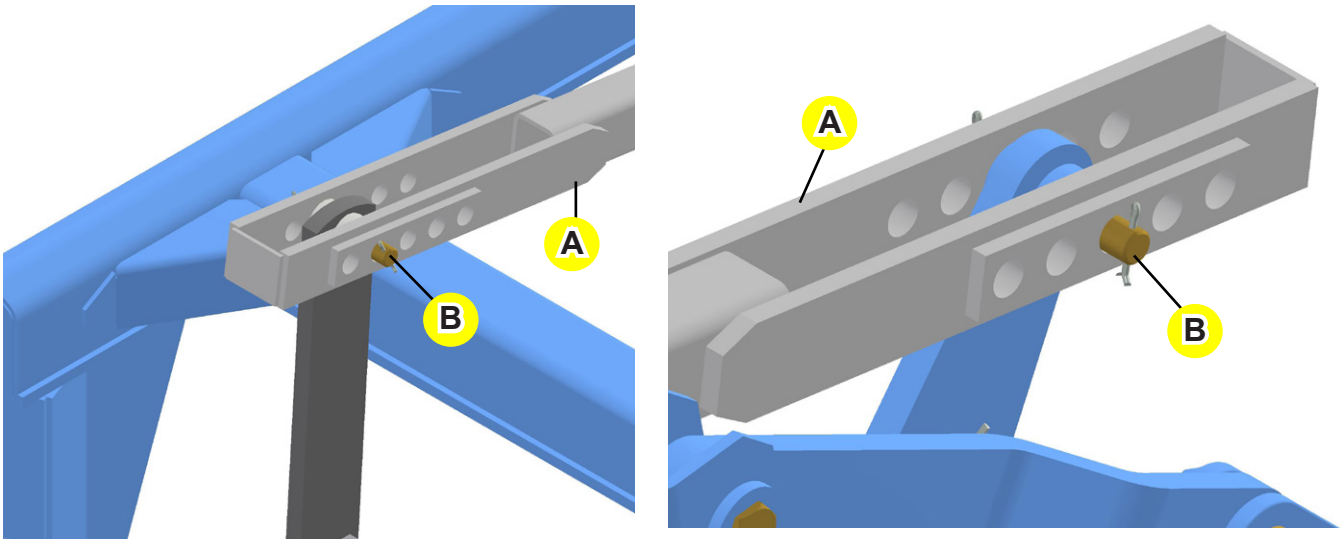


Normal position (Centralized): Used on most situations.

Position 1: Allows the tractor to approach the previous furrow.

Position 2: Allows the tractor to move away from the previous furrow.

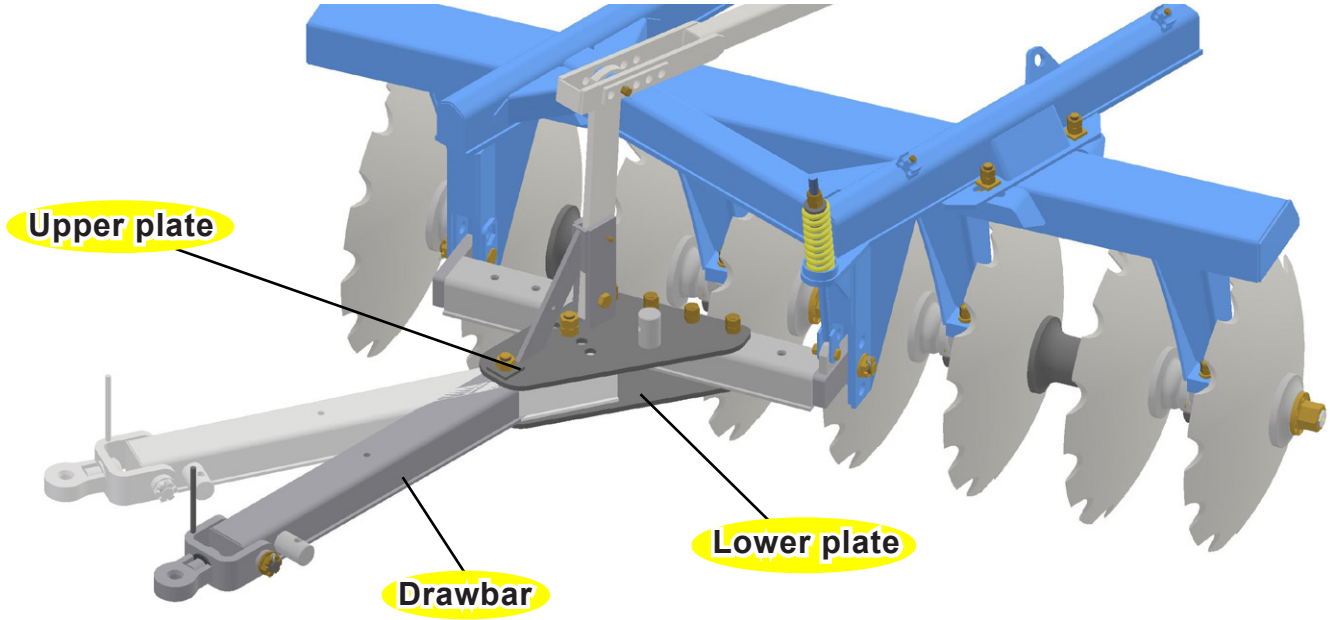
NOTE **When doing the lateral displacement, it is also necessary to fix the stabilizer bar (A) to keep the harrow leveled. To do so, use the holes (B) and let the disc gangs and the soil on the same height.**



Drawbar angles

In normal working services and during transportation, the drawbar must operate on the central hole of the upper and lower plates.

Change the bar to the other holes in order to get small lateral displacements of the harrow.



OVERVIEW:

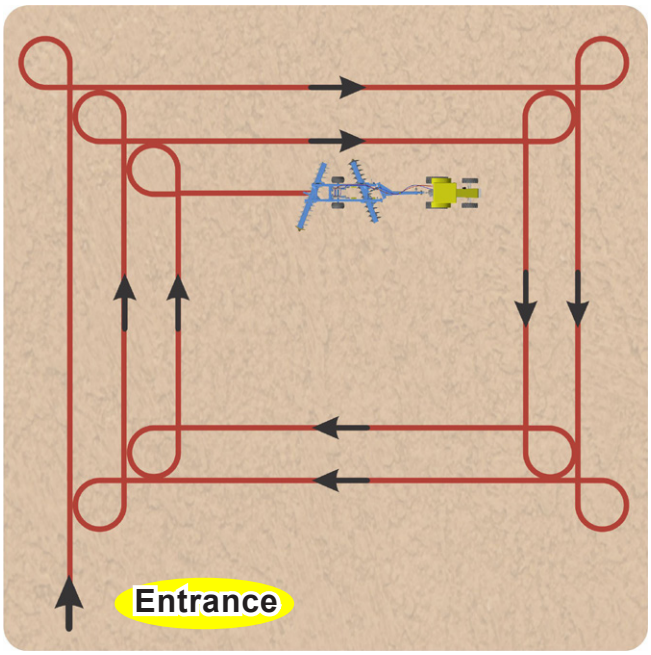
The harrow will operate correctly if it is covering the tractor trace and if there are no side drafts.

The drawbars from the tractor and harrow must be as aligned as possible regarding the working direction.

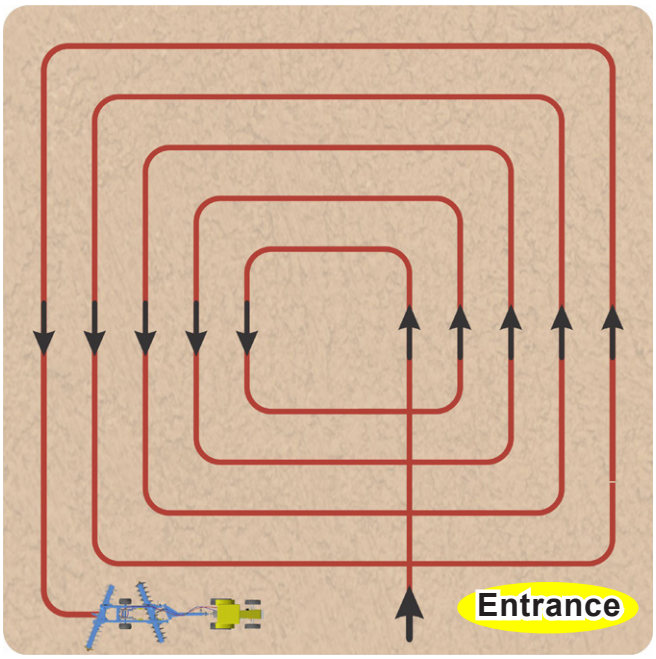
The tractor drawbar must remain loose during working and transportation.

Ways to start the harrowing

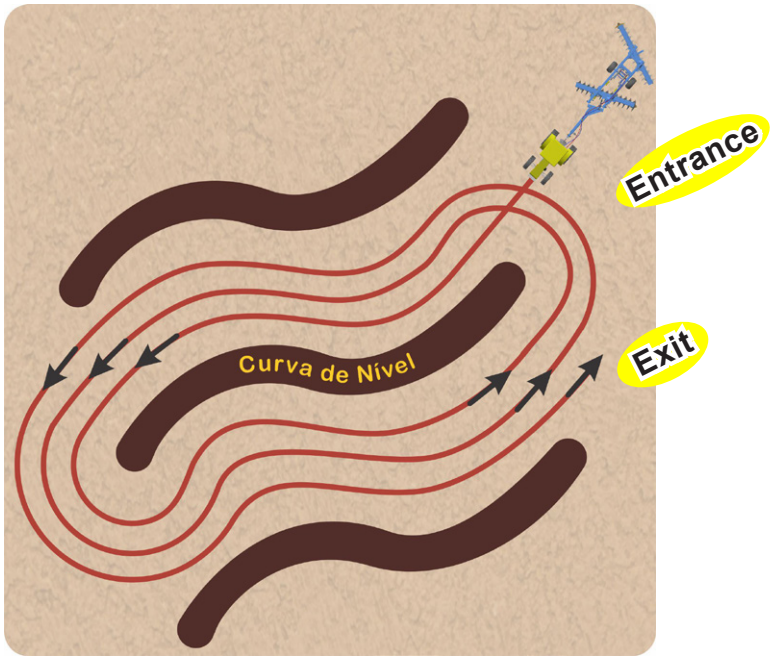
Regardless of the format and size of the field, the harrowing is made basically in two ways: from outside to inside or from inside to outside.



Harrowing in squares from outside to inside



Harrowing in squares from inside to outside

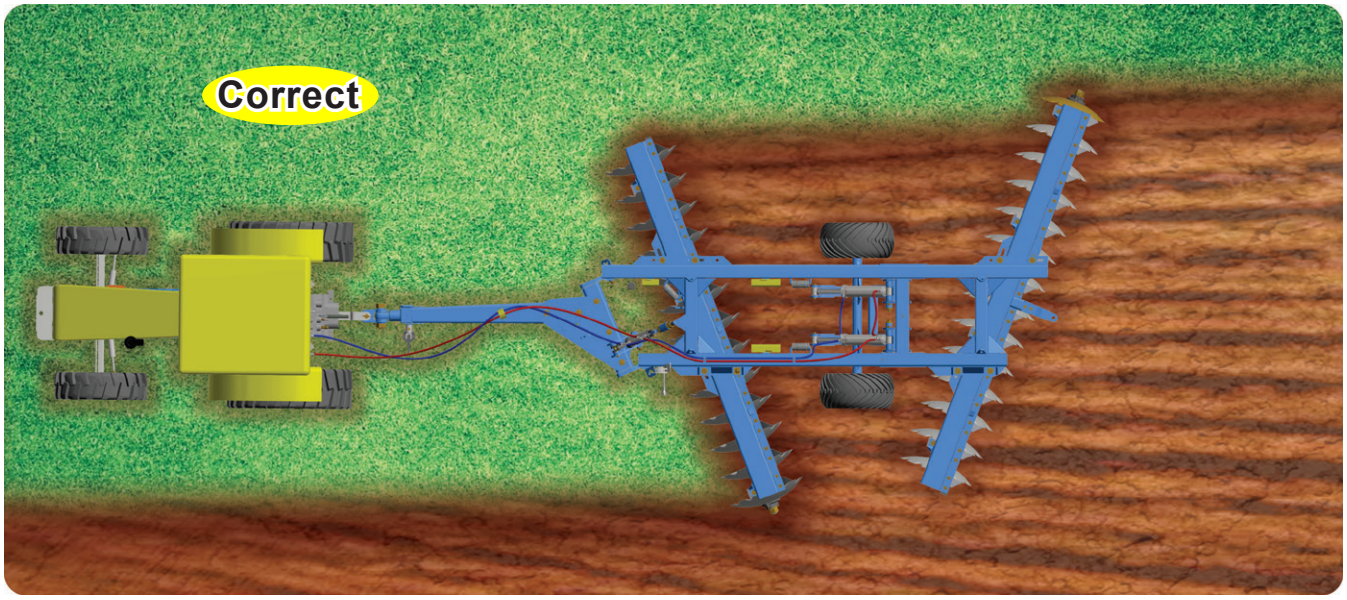


Harrowing in level

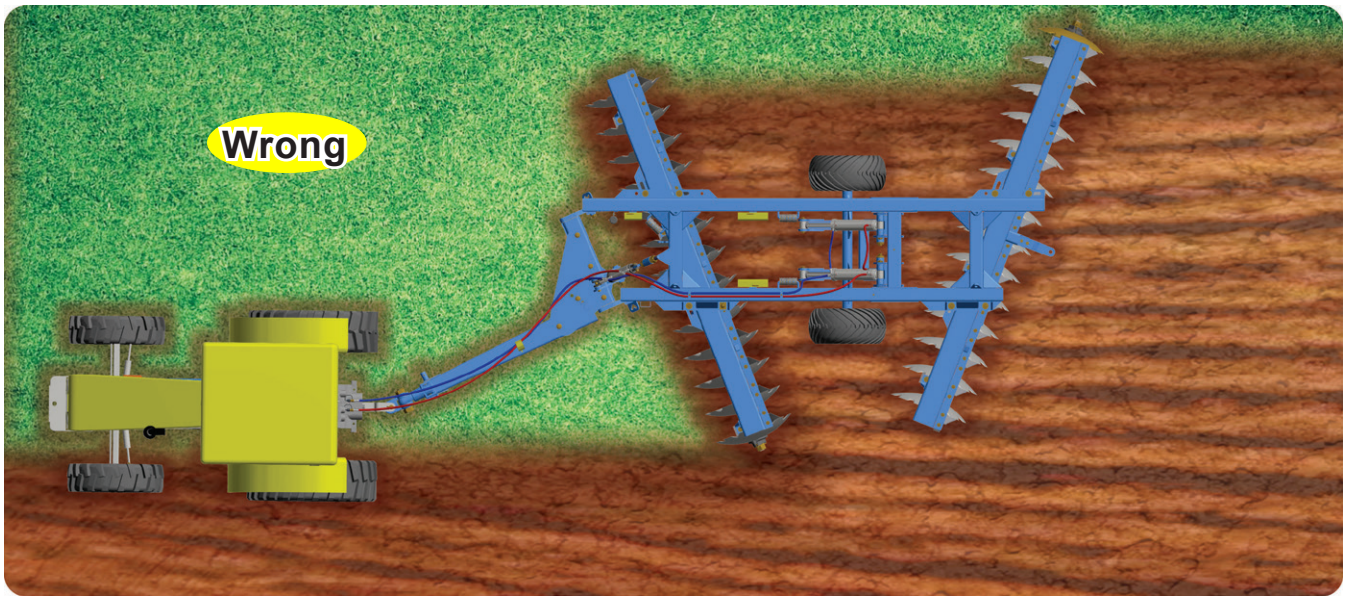
IMPORTANT **Note that the harrowed soil is always on the left hand side of the operator.**

Correct way for harrowing

Whenever possible, the tractor must pass over the unworked soil and near the previous furrow.

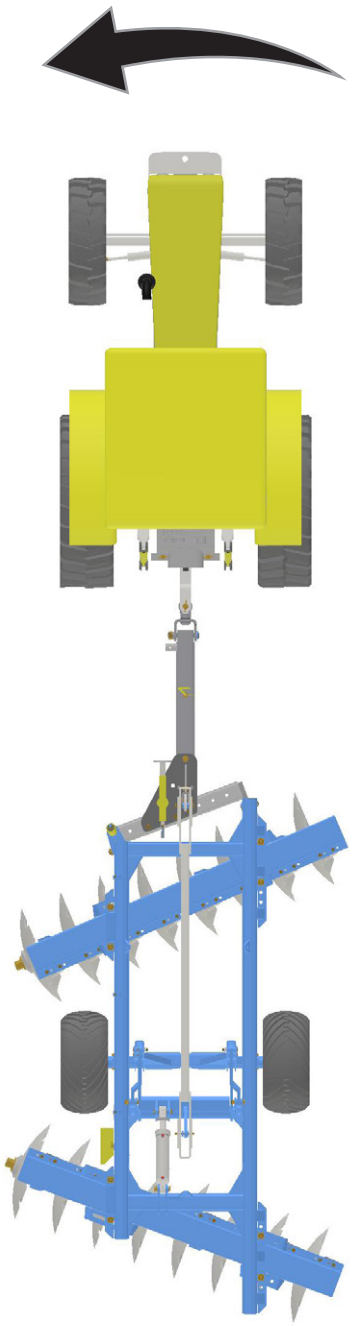


IMPORTANT **Never let the tires pass over the area that was already harrowed.**



Direction of the maneuvers

As previously mentioned, this harrow provides several working angles to operate properly in all types of soil. However, this harrow requires certain care during operations, like never make maneuvers to the right, because the angle formed on its vertex transmits great effort to the equipment, overloading traction components such as the hitch bar, the drawbar and other fixation parts.



ATTENTION **It is necessary to maneuver to the left to avoid overloads and to allow that the equipment operates normally. Following these instructions also avoids the undesirable formation of large furrows in the maneuver spots.**

Troubleshooting guide

PROBLEM	CAUSES	POSSIBLE SOLUTIONS
Tractor steering wheel pulling to the right.	Too much angle on the front gang or too small on the rear gang.	Reduce the angle from the front gang or increase the angle from the rear gang.
	Drawbar touching the stop to the left.	Move the drawbar to the left.
Disc gangs are not on harrowing level.	Front and rear disc gangs are not operating on the same depth.	Adjust the angle of the disc gangs.
Furrow opened on the left side.	Speed is too low for the soil conditions.	Increase the speed.
	Tractor being positioned far on the right.	Position the tractor in a way that the front disc on the left pass on the edge of the furrow.
	Incorrect adjustment of the disc gangs laterally.	Move the rear disc gang to the left or the front disc gang to the right.
Windrows forming on the left side.	Insufficient overlapping. Incorrect rear disc gang adjustment.	If windrows are forming, move the front disc gang to the left or the rear disc gang to the right.
Locked disc gangs.	Wet field.	Let the field dry out or penetrate the disc blade superficially to help the drying process.
	Maximum angle on the disc gangs adjustment.	Reduce the angle.
	Deep penetration on wet soil.	Lift the disc blade to reduce the penetration.
	Worn out / incorrectly adjusted scrapers.	Adjust or change the scrapers when necessary.

Troubleshooting guide

PROBLEM	CAUSES	POSSIBLE SOLUTIONS
Quick couplers do not adapt.	Different type of quick couplers.	Use male and female quick couplers from the same type.
Hoses leaking with fixed terminals.	Insufficient tightening.	Retighten carefully.
	Lack of sealing material on the thread.	Use thread sealing tape and retighten carefully.
Hydraulic cylinder leaking.	Damaged repairings.	Replace the repairings.
	Damaged rod.	Replace the rod.
	Oil with impurities.	Replace the oil, repairings and filter elements.
	Working pressure superior than the recommended one.	Adjust the control valve using the relief valve with the aid of a pressure gauge. Normal pressure: 180 Kgf/cm$^{2.}$
Quick couplers leaking.	Insufficient tightening.	Retighten carefully.
	Lack of sealing material on the thread.	Use thread sealing tape and retighten carefully.
	Damaged repairings.	Replace the repairings.

Operations - Important points

- Retighten nuts and bolts after the first day of work and check the conditions of all pins and cotter pins. Then, retighten every 24 operating hours.
- Carefully observe the lubrication intervals.
- Special attention should be given to the disc gangs, retightening daily during the first week of use. Then, retighten periodically.
- Choose a gear that allows the tractor to maintain certain power reserve, ensuring against unforeseen efforts.
- Always inflate the tires with the aid of a contention device (tire inflation cage).
- The correct tire inflation is important; keep the same pressure on every tire. (Check the 'tires inflation' page on the 'maintenance' section).
- Speed is relative to the tractor gear and can only be determined by local conditions. We adopted an average 05 to 07 km/h, which is not advisable to overcome to maintain service efficiency and avoid possible damages to the equipment.
- It is important to keep a constant speed during the whole operation.
- Only people who own a complete knowledge of the tractor and equipment must operate them.
- Be on a wide field and maneuver on slow gear to hitch the equipment, being ready to brake when necessary.
- Remove sticks or any object that may get stuck on the disc blades.
- The tractor drawbar must remain loose during working and transportation.
- Only pull the equipment using a tractor with enough power.
- During working or transportation, do not allow passengers on the tractor or equipment.
- Always keep the equipment centralized related to the tractor and leveled related to the soil.

Operations - Important points

- To carry out any verification on the equipment, lower it to the ground and shut down the tractor engine.
- Whenever unhitching the equipment, either on the field or shed, do it on a flat and firm place and use the jacks. Make sure the equipment is properly supported.
- Carry out the operations on a controlled and careful manner.
- During working, do not maneuver to the right hand side, as the angle formed by the disc gangs would start to transmit great effort to the equipment, thus overloading the traction components.
- The disk harrow activation to open or close the disc gangs must be done gradually and with the tractor in movement.
- Relieve the control valve pressure before disconnecting the quick couplers and when doing any verification in the hydraulic circuit or on the retention valve.
- Do not check eventual leaks using your bare hands, as the high pressure may cause body injury. Use a cardboard or any other suitable object.
- As previously mentioned, this disk harrow has several settings. However, only the local conditions can determine its best adjustment.

Lubrication

To reduce the wear caused by the friction between the moving parts of the harrow, it is necessary to carry out a correct lubrication, as described below.

1) Every 24 operating hours, lubricate the articulations through the grease fittings in the following way:

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

• Remove the remainder old grease around the articulations.

• Clean the grease fittings with a cloth before inserting lubricant and replace the damaged ones.

• Apply an enough amount of new grease.

• Use medium consistency grease.

2) The lubrication of the roller bearing should be done in the same aforementioned period. (24 hours).

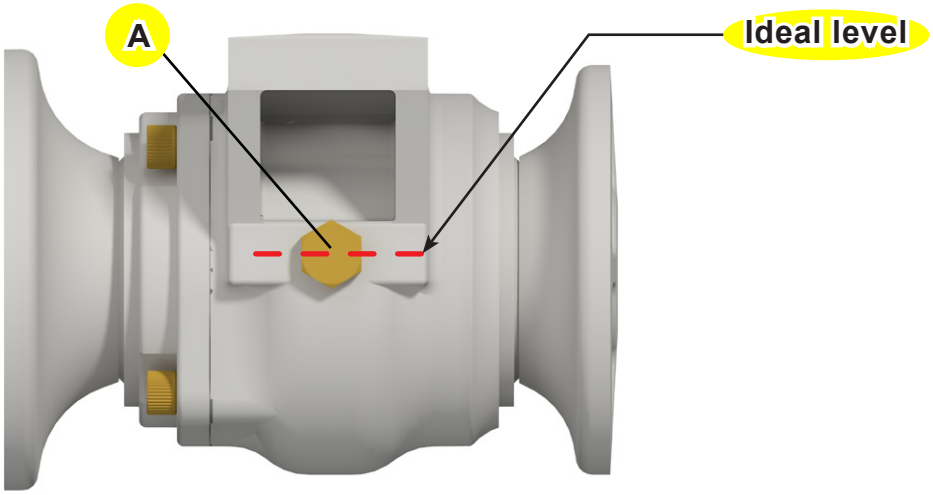
2.1) The roller bearings with oil bath work in constant lubrication, but it is still necessary to give them the following attention:

• In a flat place, check the oil level of each bearing before using the harrow for the first time and every day of the first week.

• Then, start to check weekly.

• Change all the oil every 1,000 working hours.

• Use only SAE 90 mineral oil.

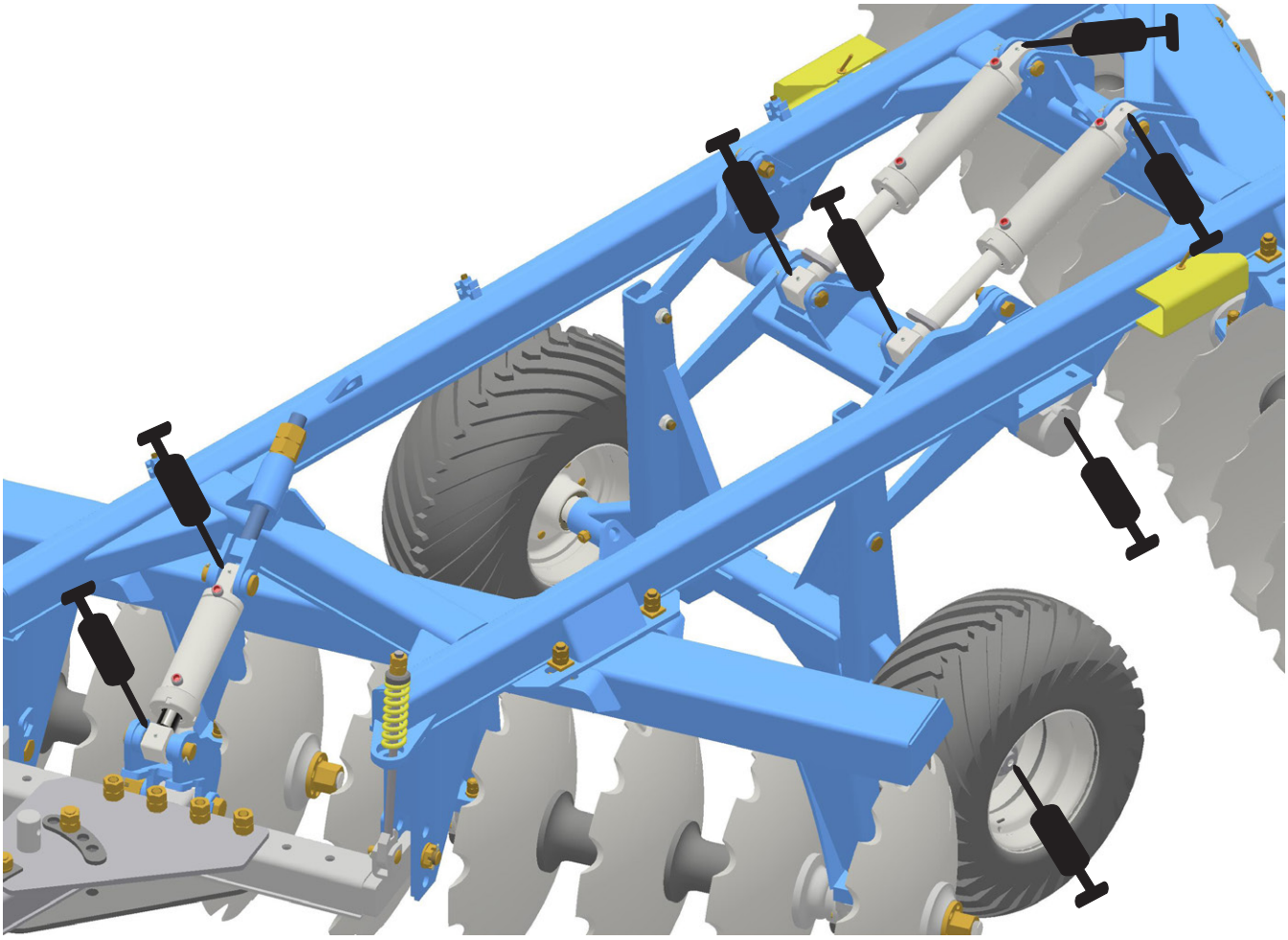


NOTE **The suitable level is when the oil reaches the hole of the plug (A), being the disk harrow in a flat place.**

The oil volume on the bearings is 350 ml.

Lubrication points

Lubricate every 24 operating hours.



NOTE **Lubricate the points shown above and all grease fittings as well.**

Wheelset hubs lubrication

The wheelset hubs must be lubricated every 150 hours. When the existence of any clearance is noticed, carry out a maintenance on the wheel hubs.

Disassemble the hubs and remove their internal components. Clean all parts using diesel oil or kerosene.

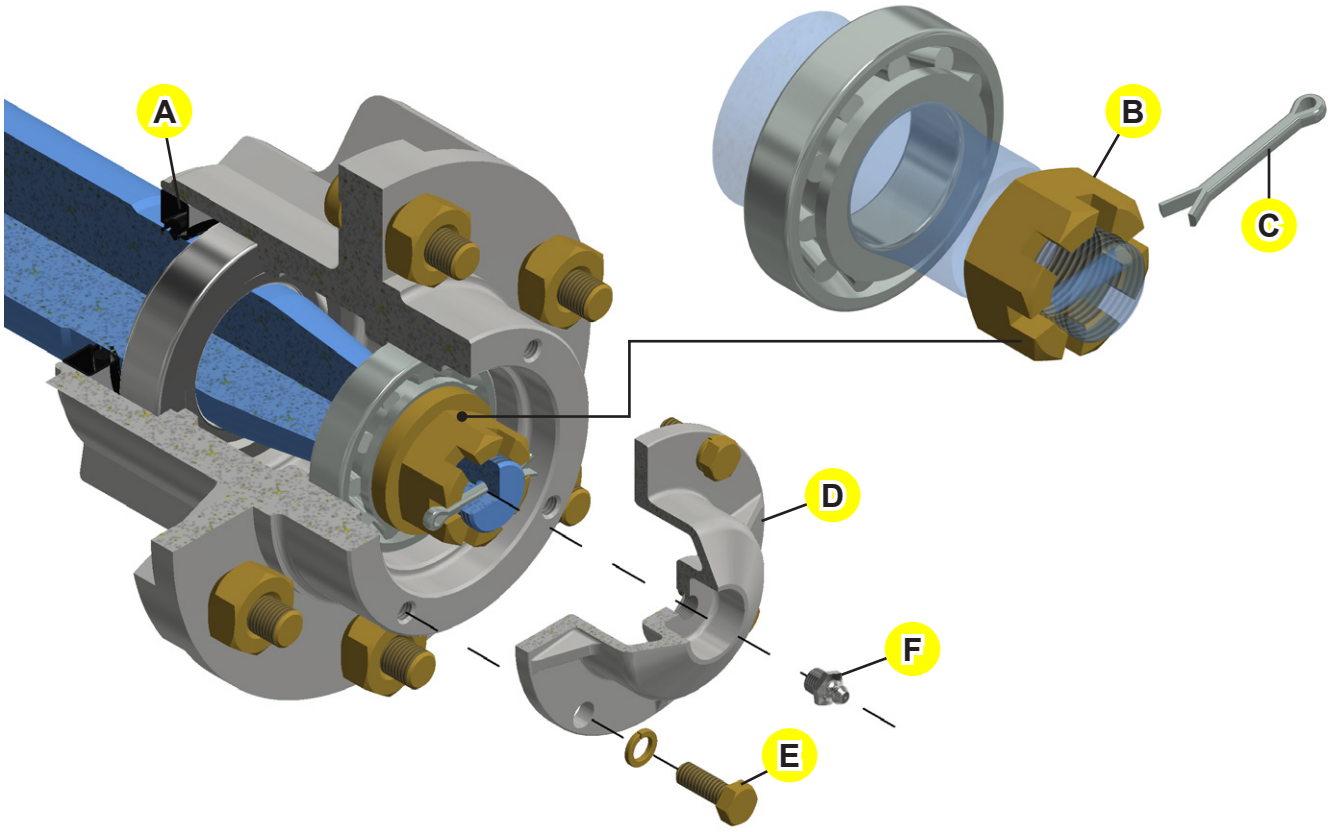
Check the existence of clearances, the condition of the bearings, retainers or bushings. If there is any part that shows excessive wear or damages, replace them.

The bearing must be replaced in a preventive manner, to avoid that it breaks and to avoid greater maintenance costs, since more parts of the set suffer damages when the bearing breaks during the job.

Check the retainer position (A) to let the excess of grease flow out of the hub and be careful to not damage the retainer.

Adjust the castle nut (B) on the hub using a wrench to get some resistance while turning the hub. Do not totally tighten it. Lock it using a cotter pin (C).

Place the hubcap (D) and lock using a bolt (E) and spring washer. Lastly, attach the grease fitting (F) on the hubcap.



Whenever the retainer is damaged, replace it immediately.

Do not forget to apply the specific grease, that is a lithium soap grease for this equipment, grade NLGI 2 with Extreme Pressure additive, anticorrosive and antioxidant.

Hydraulic cylinder maintenance

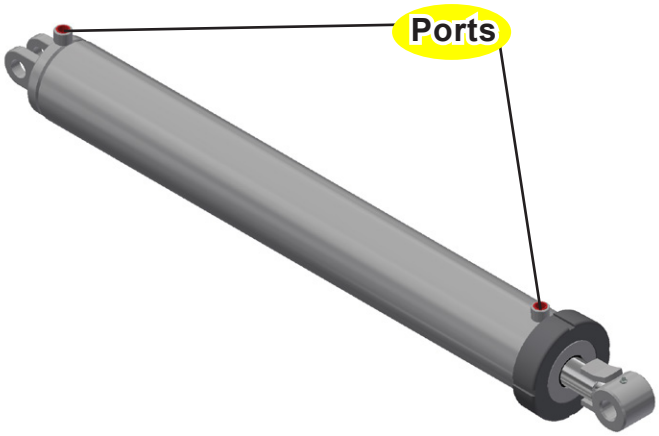
When cylinder repair is required, clean off unit, disconnect hoses and plug ports before removing cylinder.

When removed, open the cylinder ports and drain the cylinder's hydraulic fluid.

Examine the type of cylinder. Make sure you have the correct tools for the job.

You may require the following tools:

- Proper seal kit;
- Screwdriver and rubber cable;
- Pliers and wrenches.



IMPORTANT **Never make any verification or maintenance if the system is pressurized.**

Disassembly:

1) Remove the end cap (A);

2) Carefully remove inner assemblies (B);

3) Disassemble the piston (C) from the rod assembly by removing lock nut (D);

4) Slide off gland assembly (E) and end cap (A);

5) Remove seals and inspect all parts for damage;

6) Install new seals and replace damaged parts with new components;

7) Inspect the inside of the cylinder barrel, piston, rod and other polished parts for burrs and scratches. Smooth areas as needed with an emery cloth.

NOTE **Do not clamp rod by chrome surface.**

Hydraulic cylinder assembly

Reassembly:

1) Reinstall rod through gland (E) and end cap (A);

2) Secure piston (C) to rod with lock nut (D). Torque lock nut to proper value (consult torque table on the "important data" section);

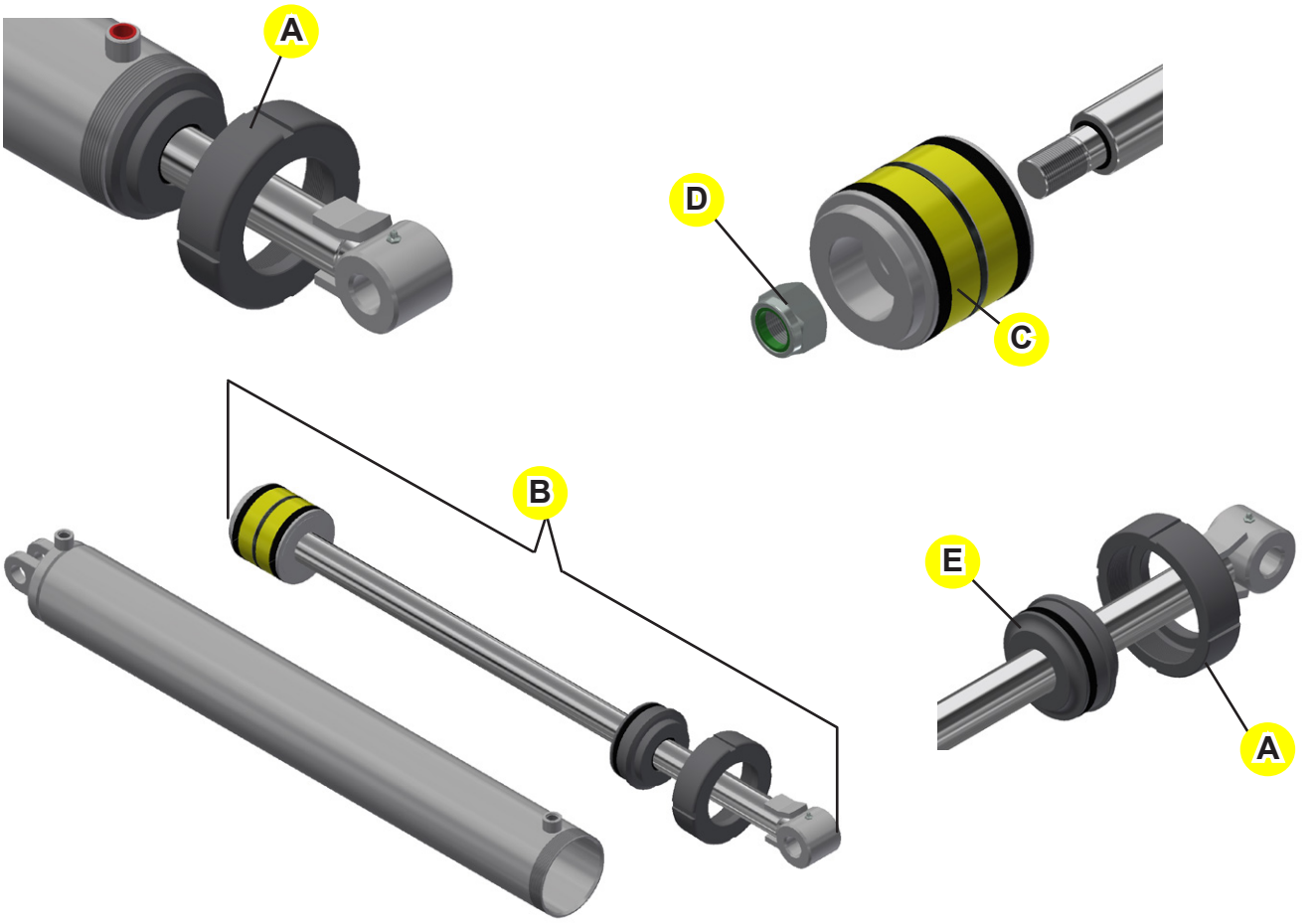
3) Lube inside of barrel, piston seals, and gland seals with hydraulic oil;

4) With cylinder body held gently, insert the inner assemblies (B) using a slight rocking motion;

5) Apply Loctite 277 before installing the cylinder end cap (A);

6) Torque cylinder end cap (A) to 400 lb.ft (600 N.m).

IMPORTANT **Insert the gland (E) on the cylinder head and align it with the tube so it will fit correctly on the cylinder barrel.**

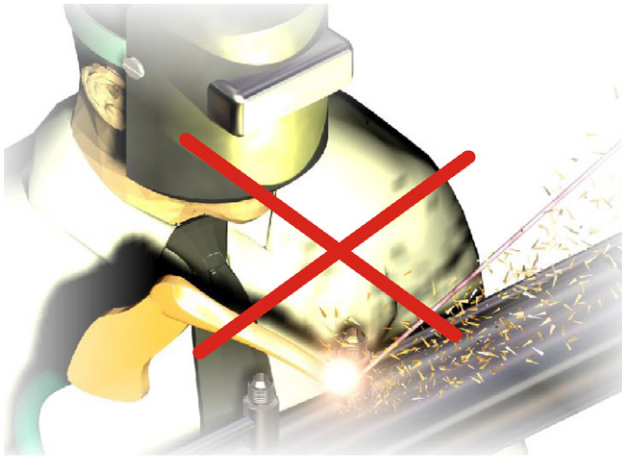


NOTE **Do not clamp rod by chrome surface.**

Hydraulic safety

Make sure that all components in the hydraulic system are kept in good condition and are clean. Carry out the maintenance of the hydraulic parts on a clean place, free from dust or contaminants. Otherwise, there may have malfunction or premature wear on the equipment.

The correct operation and maintenance of the hydraulic system will prevent damages, air infiltration on the system, oil and system overheating, damages to the rubber components, etc.



Periodically or when the oil is replaced anormally or even when there is loss of power, inspect the hydraulic system, fasten the connections that are leaking, replace the hoses that are almost reaching its expiration date or if they show any cut, crack or dryness. Regarding the hoses assembly, do it in a way that they always can flex, without twisting or pulling it.

If there is any problem with the hydraulic cylinder, do not carry out any maintenance procedure or weld heating, as both of this may cause roundness on the barrel or other problems, consequently leading to internal leakages, lack of power, gripping, damages to the cylinder rods, etc.

Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fall suddenly and create a hazardous and unsafe condition.

Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.

If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface. If this doctor is not aware of this type of problem, ask for a reference or look for another one to find the proper treatment.

Before applying pressure to the system, make sure all components are tight and that lines, hoses and coupling are not damaged.

Carry out the operations on a carefully and controlled manner. Avoid to let the hydraulic system working when it is not being used.

Failure to follow these procedures may lead to fatal accidents or even death.

Disk harrow maintenance

• During offseason wash the equipment, repair any damaged paintwork, protect the disc blades with oil, lubricate all grease fittings and store the disk harrow in a covered and dry place, avoiding the direct contact of the disc blades with the soil.

• The disc blades must be replaced as soon as they are providing a low yield, mainly because of the reduction in its diameter, loss of cut and other damages that may occur during the job.

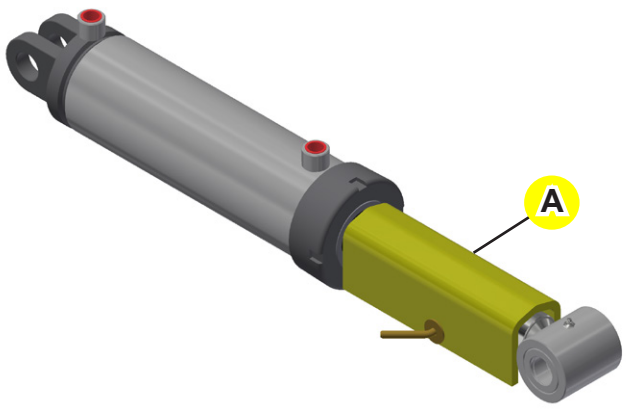
• After 24 working hours, the bolts on the disk harrow must be checked to see if they are properly tightened. To assure a great performance and avoid wear and rupture, these bolts must be tightened every so often.

• Check wear occurence on all moving parts. Replace any part, if necessary.

• Replace the missing or damaged safety decals. Marchesan supplies these decals, upon request and indication of their respective serial numbers. The operator must know the need and importance to keep the decals in the proper place and in good conditions. The operator also have to know the need to follow the instructions, as the lack of safety may increase the risk of accidents.

IMPORTANT **When uncoupling the equipment from the tractor, lift it and place the locks (A) on the cylinders; after that, lower the disk harrow until it touches the locks and place the jack with pin and cotter pin.**

If it is necessary to totally lower the equipment, do not place locks and neither the pin on the jack, as such procedure may result in damages to the jack itself.



NOTE **Use TATU original parts only.**

Tires inflation

The tires must always be properly inflated to avoid premature wear for excess or lack of pressure.

Do not attempt to mount the tires without experience and adequate equipment.

Maintain the correct tire pressure. Never inflate the tires beyond the recommended pressure.

Never weld or heat a wheel. The heat can cause increase in pressure, with a risk of tire explosion.

Welding can compromise the structure of the wheel or distort it.

When filling the tires, make sure the hose is long enough for you to stand. Also, do this process in a safety cage.

11L15 tires - 12 ply..... **(52 PSI)**

400/60 - 14 ply..... **(52 PSI)**

NOTE **For the cases where the maximum pressure is not specified on the tires, consult the tire manufacturer and adopt the pressure indicated by them.**

Calculation of hourly income

To calculate the hourly income, use the following calculation:

$$\mathbf{R} = \frac{L \times V \times E}{X}$$

Where:

R = Hourly income;

L = Harrow cutting width (meters);

V = Average speed of the tractor (meters per hour);

E = Efficiency: 0.90;

X = Hectare value = 10,000 m^2.

Example with a GAPCR 360 (12 disc blades):

R = ?

L = 1.98 m

V = 6,000 m/h (6 km/h)

E = 0.90

X = 10,000 m^2

$$\mathbf{R} = \frac{1.98\ m \times 6{,}000 \times 0.90}{10{,}000}$$

R = 1.07 hectares per hour.

NOTE **The harrow hourly income can vary by physical factors such as humidity, slope, soil hardness, appropriate adjustments and especially the working speed.**

Based on this calculation, the table on the following page shows the average hourly income and also for a day, that is, nine (9) hours of work.

Average income table

Model	Number of disc blades	Cutting width (mm)	Hourly income (ha)	Daily income (ha)
GAPCR 360	12	1.98	1.07	9.62
	14	2.34	1.26	11.37
	16	2.70	1.46	13.12
	18	3.06	1.65	14.87
	20	3.42	1.85	16.62
	22	3.78	2.04	18.37
	24	4.14	2.24	20.12
	28	4.86	2.62	23.62

NOTE **An average speed of 6 km/h was adopted to prepare the table above.**

To know how many hours will be spent to work in a certain previously known area, it is necessary to divide the value of the area by the hourly income.

Example: An area of 50 hectares to be worked with a GAPCR 360 that has 12 disc blades (Hourly income = 1.07 ha).

So: $\frac{50}{1.07} = 46.72$

Approximately will be spent 47 (Forty-seven) hours to work in an area of 50 hectares.

Torque table

The table below gives correct torque values for various bolts. Tighten all bolts to the torques specified in chart unless otherwise noted. Check the tightness of bolts periodically, using this bolt torque chart as a guide. Replace hardware with the same strength (Grade/ Class) bolt.

TORQUE VALUES CHART

Bolt Diameter	Grade 2		Grade 5		Grade 8	
	Coarse	Fine	Coarse	Fine	Coarse	Fine
1/4”	50 In. Lbs.	56 In. Lbs.	76 In. Lbs.	87 In. Lbs.	9 Ft. Lbs.	10 Ft. Lbs.
5/16”	8 Ft. Lbs.	9 Ft. Lbs.	13 Ft. Lbs.	14 Ft. Lbs.	18 Ft. Lbs.	20 Ft. Lbs.
3/8”	15 Ft. Lbs.	17 Ft. Lbs.	23 Ft. Lbs.	26 Ft. Lbs.	33 Ft. Lbs.	37 Ft. Lbs.
7/16”	25 Ft. Lbs.	27 Ft. Lbs.	37 Ft. Lbs.	41 Ft. Lbs.	52 Ft. Lbs.	58 Ft. Lbs.
1/2”	35 Ft. Lbs.	40 Ft. Lbs.	57 Ft. Lbs.	64 Ft. Lbs.	80 Ft. Lbs.	90 Ft. Lbs.
9/16”	50 Ft. Lbs.	60 Ft. Lbs.	80 Ft. Lbs.	90 Ft. Lbs.	115 Ft. Lbs.	130 Ft. Lbs.
5/8”	70 Ft. Lbs.	80 Ft. Lbs.	110 Ft. Lbs.	125 Ft. Lbs.	160 Ft. Lbs.	180 Ft. Lbs.
3/4”	130 Ft. Lbs.	145 Ft. Lbs.	200 Ft. Lbs.	220 Ft. Lbs.	280 Ft. Lbs.	315 Ft. Lbs.
7/8”	125 Ft. Lbs.	140 Ft. Lbs.	320 Ft. Lbs.	350 Ft. Lbs.	450 Ft. Lbs.	500 Ft. Lbs.
1”	190 Ft. Lbs.	205 Ft. Lbs.	480 Ft. Lbs.	530 Ft. Lbs.	675 Ft. Lbs.	750 Ft. Lbs.
1.1/8”	265 Ft. Lbs.	300 Ft. Lbs.	600 Ft. Lbs.	670 Ft. Lbs.	960 Ft. Lbs.	1075 Ft. Lbs.
1.1/4”	375 Ft. Lbs.	415 Ft. Lbs.	840 Ft. Lbs.	930 Ft. Lbs.	1360 Ft. Lbs.	1500 Ft. Lbs.
1.3/8”	490 Ft. Lbs.	560 Ft. Lbs.	1100 Ft. Lbs.	1250 Ft. Lbs.	1780 Ft. Lbs.	2030 Ft. Lbs.
1.1/2”	650 Ft. Lbs.	730 Ft. Lbs.	1450 Ft. Lbs.	1650 Ft. Lbs.	2307 Ft. Lbs.	2670 Ft. Lbs.

GRADE 2
No Marks.

GRADE 3
3 Marks.

GRADE 8
6 Marks.

NOTE **For metric conversion:**

- **Multiply inch-pounds by .113 to convert to newton-meters (Nm).**
- **Multiply foot-pounds by 1.356 to convert to newton-meters (Nm).**

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.

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⚠ ATENÇÃO

- RECOMENDAÇÕES GERAIS DE SEGURANÇA -

1 - Apenas pessoas que possuem o completo conhecimento do trator e dos implementos devem conduzi-los.

2 - Para engatar os implementos faça as manobras em marcha lenta, em local espaçoso e esteja preparado para aplicar os freios.

3 - Para acoplamento na tomada de força desligue o motor do trator.

4 - O motor não deve funcionar em locais sem o ideal arejamento, devido a toxidade dos gases expelidos.

5 - Faça todos os lastreamentos necessários para tracionar equipamentos que os exigem, assim as operações tornam-se mais seguras.

6 - Em operações com o trator estacionado trave os freios e calce as rodas.

7 - Todas as peças móveis como correias, polias, engrenagens, etc. merecem cuidados especiais.

8 - Vista roupas e calçados adequados para operação das máquinas e implementos agrícolas.

9 - Não permita que demais pessoas acompanhem o operador no trator ou no implemento.

10 - O uso das roçadeiras exige cuidados especiais. Não permita a aproximação de pessoas ou animais durante o serviço.

11 - Não efetue regulagens com o implemento em funcionamento.

12 - Não permita que crianças brinquem sobre ou próximo o implemento estando o mesmo em operação, transporte ou armazenado.

13 - A velocidade de operação deve ser cuidadosamente controlada.

14 - Em terreno inclinado mantenha a estabilidade ideal. Em início de desequilíbrio abaixe a aceleração e não levante o implemento.

15 - Os implementos de controle hidráulico devem ser abaixados até o solo e aliviados da pressão antes de desconectar qualquer tubulação.

16 - Não verifique vazamentos nos circuitos hidráulicos com as mãos, a alta pressão pode provocar lesões corporais; use papelão.

17 - No término do trabalho os implementos deverão ser desengatados e devidamente apoiados no solo ou sobre cavaletes, não podendo ficar suspensos pelo hidráulico do trator.

18 - Não transite em rodovias ou estradas pavimentadas.

19 - Os implementos agrícolas tais como grades, arados e outros, possuem normalmente órgãos ativos afiados, com bordas cortantes que oferecem riscos de acidentes mesmo quando não estão operando. Portanto estes devem ser mantidos em local apropriado, devidamente apoiados no solo; e impedindo-se o acesso de crianças e pessoas alheias ao manuseio dos mesmos.

20 - Para estacionar o trator, desligue o motor, neutralize a ação dos comandos e aplique os freios.

⚠ ATENCION

- RECOMENDACIONES GENERALES DE SEGURIDAD -

1 - Solamente personas con el completo conocimiento del tractor y de los implementos deben conduzirlos.

2 - Para enganchar los implementos, proceda con maniobras en marcha lenta, en local con espacio y este preparado para aplicar los frenos.

3 - Para acoples en la toma de potencia apague el motor del tractor.

4 - El motor no debe funcionar en locales sin ventilación suficiente debido la toxicidad de los gases expelidos.

5 - Proceda con los lastres necesarios para traccionar equipos que asi exigir de esta manera, las operaciones se tornan mas seguras.

6 - En operaciones con el tractor estacionado (parqueado) trabar los frenos y las ruedas.

7 - Todas las piezas movibles como: bandas, poleas, engranajes, etc... necesitan cuidados especiales.

8 - Vestir ropas y calzados adecuados para operación de las máquinas e implementos agrícolas.

9 - No permita que otras personas acompañen el operador en el tractor o en el implemento; salvo si posee asiento adecuado.

10 - El uso de las rotativas (cortamalezas) exige cuidados especiales. No permita la aproximación de personas o animales durante el trabajo.

11 - No efectuar regulajes con el equipo en funcionamiento.

12 - No permitir que niños jueguen sobre o próximo de los equipos, en operación, durante el transporte o almacenado.

13 - La velocidad de operación debe ser cuidadosamente controlada.

14 - En terreno inclinado mantenga la estabilidad ideal. En inicio de desequilibrio baje la aceleración y no levante el implemento.

15 - Los implementos de control hidráulico deben ser rebajados hasta el suelo y aliviar la presion antes de desconectar cualquier tuberia.

16 - No verificar filtraciones en los circuitos hidráulicos con las manos, la alta presión puede provocar lesiones corporales, use carton u otro objeto adecuado.

17 - Después del termino del trabajo, los equipos deberán ser desenganchados y debidamente apoyados en el suelo o sobre caballetes, aliviando el hidráulico del tractor.

18 - No transitar en carreteras o caminos pavimentados.

19 - Los implementos agrícolas, como: rastras, arados y otros, tienen normalmente organos activos afilados, con bordes cortantes que ofrecen riesgos de accidentes, aún cuando detenidos, por lo tanto, estos deben ser mantenidos en local apropriado, debidamente apoyados en el suelo e impidiendo el acceso de niños y personas ajenas al uso de los mismos.

20 - Para estacionar (parquear) el tractor, apague el motor, neutralice la acción de los comandos y aplique los frenos.

⚠ ATTENTION

- GENERAL RECOMMENDATION ABOUT SAFETY -

1 - Only person who owns a full knowledge of tractor and implements, must operate them.

2 - Take care to prevent injury to the hands or fingers when hitching the implement to the tractor.

3 - Always shut the tractor off before connecting the power take off.

4 - Never turn on the tractor engine within not aired places, due to toxic gases expelled.

5 - Before start the season it is necessary to prepare adequately the tractor and the implement to become the operations safer.

6 - Lock the tractors parking brake and block the wheels, before dismounting the tractor for service or to make adjustments.

7 - Never allow riders to accompany the operator on tractor or implement, except if there is an adequate seat.

8 - Be sure that everyone is standing clear before operating the agricultural implement or machinery.

9 - Use extreme caution and wear gloves when handling the disc blades or gang assemblies.

10 - Wear adequate clothes and shoes to operate agricultural implements and machinery.

11 - Do not attempt to make adjustments when the unit is running.

12 - Disconnect the hydraulic hoses from breakaway couplers after bleeding off the system.

13 - Always block-up raised equipment when servicing. Never rely on the hydraulic system.

14 - The speed must be controlled when transporting the implement on rough roads, bridges, steep grades or any other adverse conditions.

15 - Lower the implement or machinery completely to the ground before unhitching from the tractor.

16 - Before make any inspection on hydraulic hoses for leaks, cycle the hydraulic cylinders several times to purge entrapped air from the system.

17 - When the tractor is equipped with swinging drawbar, lock the drawbar in the fixed position.

18 - Agricultural implements such as: Disc Harrows, Disc Ploughs and others have disc blades that is sharp and could cut hands, feet, etc... even when they are not in operation. In other to avoid serious accidents, use chock blocks to prevent the gang assembly from rolling surfaces before assembly to the frame. Wear gloves when handling the blades or gang assemblies.

19 - On transport of the harrow always install transport lock devices.

20 - When parking the tractor, turn the engine off, lock the tractors parking brake and remove the key.

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