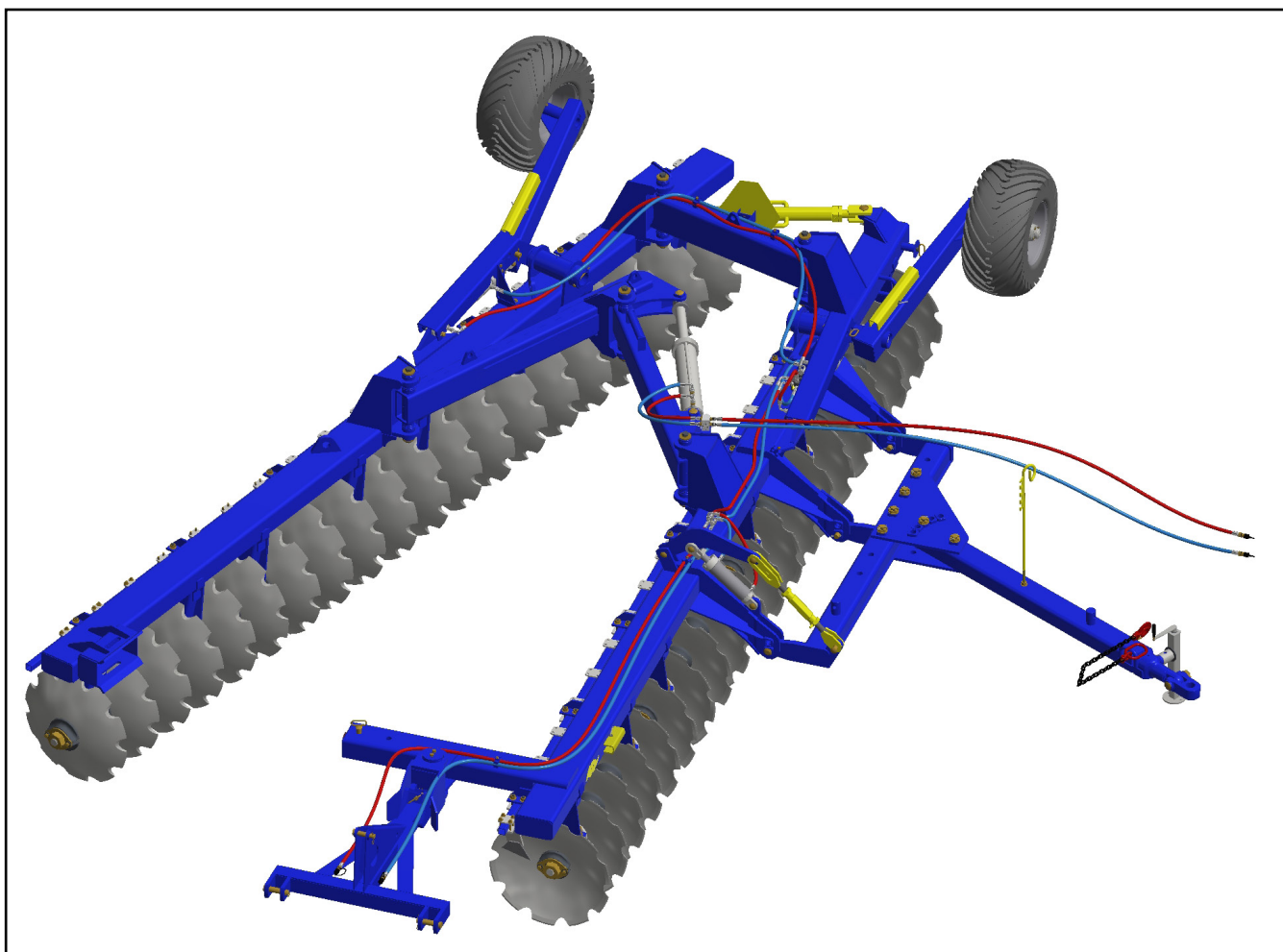


**MARCHESAN**

# **INSTRUCTIONS MANUAL**



# ***GAPCW-EP***



# Introduction

The GAPCW-EP disk harrow were designed to work in any kind of soil, with excellent application on the soil preparation for annual crops, sugar cane, etc.

The heavy-duty structure with proper dimensioning is made of bent steel plates joined by a good penetration weld and fine finishing, with tough parts in the load concentration.

The GAPCW-EP transportation is made through an efficient wheelset system composed by tires and hydraulic cylinders, which allows long-distance transportations.

This instructions 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.



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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 during transportation, 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.

|   |                      |
|---|----------------------|
| MODELO<br>MODEL   | <input type="text"/> |
| Nº SÉRIE<br>SERIAL NR   | <input type="text"/> |
| DATA<br>DATE  | <input type="text"/> |
| PESO<br>WEIGHT  | <input type="text"/> |
| <p>MARCHESAN IMPLEMENTOS E<br/>MÁQUINAS AGRÍCOLAS "TATU" S.A.<br/>www.marchesan.com.br<br/>AV. MARCHESAN, 1979 - MATÃO-SP-BRASIL<br/>CNPJ: 52.311.289/0001-63</p> |                      |
|   |                      |

### 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

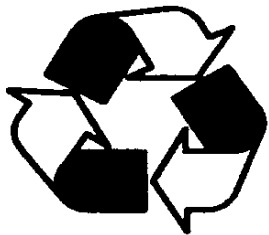
---



Dear 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 they should be carefully read and observed.**

The GAPCW-EP 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 the 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



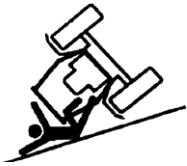
Never use your bare hands to check hydraulic leaks, the high pressure can cause injuries.

---



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 strictly forbidden.

---



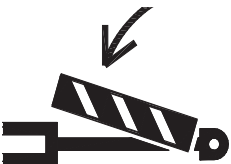
Have extreme caution when driving under electrical power lines. Any contact may result in severe shocks, injuries or death.

---



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

---



Always use the safety locks to carry out maintenance operations and 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.
- Have full knowledge of the soil before starting to work. Use the speed which is suitable to the conditions of the ground. 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 **protective devices**.
- Be careful while hitching the equipment to the tractor.
- Wear appropriate gloves near the disc blades.
- When setting the harrow to transport position, check if there are no people or animals close or under the equipment.
- 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 harrow quickly.
- Always shut down the engine, remove the key and use the handbrake before leaving the tractor seat.
- Only pull the equipment using a tractor 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.
- 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.
- Do not allow people or animals to get under the equipment at any time.
- Please check the general safety instructions on the back cover of this manual.



# To the operator

## 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 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.
- Fasten the moving parts that may get loose and cause accidents.
- Underpin the equipment appropriately.
- 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 to the truck or trailer. If necessary use banners, lights and other devices in order to give adequate warning to the other drivers.

# To the operator

## 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.



**LUBRIFICAR E REAPERTAR DIARIAMENTE**  
**LUBRICATE AND TIGHTEN DAILY**  
**LUBRICAR Y REAPRETAR DIARIAMENTE**

05.03.03.1827

# To the operator



## ATENÇÃO / ATTENTION / ATENCIÓN

### LEIA ATENTAMENTE AS INSTRUÇÕES ANTES DA MONTAGEM, OPERAÇÃO OU MANUTENÇÃO DO EQUIPAMENTO.

- Tracione o equipamento somente com trator de potência adequada.
- Tenha extrema cautela quando trabalhar com os discos ou próximos deles. Utilize luvas.
- Pare o serviço antes de efetuar qualquer manutenção ou ajuste. Nunca faça reparos ou retire obstáculos da grade com o trator em movimento.
- Não permita a aproximação de pessoas quando estiver operando, ajustando, abrindo ou fechando a grade. Fique longe das partes móveis quando estiver erguendo ou abaixando a grade.
- A barra de tração do trator deve permanecer solta no trabalho e fixa no transporte.
- Durante o trabalho faça manobras somente pelo lado esquerdo.
- Reaperte todas as porcas e parafusos diariamente durante a primeira semana de uso. Depois, inspecione periodicamente. Inspecione o aperto dos eixos das seções de discos depois das primeiras 10 horas de uso. Mantenha os eixos das seções constantemente apertados.
- Durante o trabalho ou transporte nunca permita passageiros no trator ou no equipamento.
- Verifique sempre se os pinos e contrapinos estão travados.
- Para transportar a grade em maiores distâncias, é necessário utilizar as travas para transporte nas hastes dos cilindros hidráulicos. Verifique também o aperto das rodas periodicamente, especialmente antes de transportar a grade.
- A velocidade segura de transporte é de 20 km/h. Nunca transporte a grade em velocidade superior a 30 km/h.
- Alivie a pressão do comando antes de soltar os engates rápidos e ao fazer qualquer verificação no circuito hidráulico.

### READ AND UNDERSTAND THE INSTRUCTIONS BEFORE ASSEMBLING, OPERATING OR SERVICING THE EQUIPMENT.

- Only drive the equipment using tractors with appropriate power.
- Use extreme caution when working with or around the disc blades. Wear protective gloves.
- Always stop working before attempting to service or make an adjustment. Never service or remove obstacles from the equipment with the tractor running.
- Do not allow any person to be near the equipment when operating, adjusting and closing. Stand off all moving parts when raising or lowering the harrow.
- The tractor hitch bar must remain loose at work and fixed on transportation.
- When operating, make turns only to the left side.
- Tighten all nuts and bolts daily during the first week of operation. Thereafter, inspect them periodically. Inspect the gang axis tightening after the first 10 hours of operation and periodically afterwards. Maintain the gang shaft tightened at all time.
- During work or transportation, the presence of passengers is not allowed on the tractor or equipment.
- Always check if the pins and cotter are locked.
- To transport the harrow over long distances, it is necessary to use the transport locks, which are attached to the hydraulic cylinders. Also, check the tires grip periodically, especially before transporting the harrow.
- The safe transport speed is 20 kilometers per hour (12,4 miles per hour). Never transport in excess of 30 kilometers per hour (18,6 miles per hour).
- Relieve the control valve pressure before disconnecting the quick couplers and when doing any verification in the hydraulic cylinder.

### LEIA Y ENTENDER LAS INSTRUCCIONES ANTES DE ARMAR, OPERACIÓN Y MANTENIMIENTO DEL EQUIPO.

- Tracione el equipo solamente con tractor de potencia adecuada.
- Tenga mucho cuidado cuando se trabaja con los discos o cerca de ellos. Utilizar guantes.
- Parar el servicio antes de cualquier mantenimiento o ajuste. No haga reparaciones o remover los obstáculos de la rastra con el tractor en movimiento.
- No permita el acercamiento de las personas durante la operación, ajuste e en la abertura o cierre de la rastra. Manténgase alejado de las partes móviles cuando subir y bajar la rastra.
- La barra de tracción del tractor debe permanecer suelta en el trabajo y fija en el transporte.
- Durante el trabajo haga maniobras solamente por el lado izquierdo.
- Reapretar todas las tuercas y tornillos diariamente durante la primera semana de uso. Después, inspeccionar periódicamente. Inspeccionar el aprieto del eje de las secciones de discos después de las primeras 10 horas de uso. Mantenga los ejes de las secciones constantemente apretados.
- Durante el trabajo o transporte no permita pasajeros en el tractor o el equipo.
- Verifique siempre se los pernos y contrapernos están trabados.
- Para transportar la rastra en mayores distancias, es necesario utilizar las trabas para transporte en los vástagos de los cilindros hidráulicos. Verificar también el aprieto de las ruedas periódicamente, especialmente antes de transportar la rastra.
- La velocidad de transporte segura es de 20 km/h. Nunca transporte la rastra en velocidad superior a 30 km/h.
- Alivie la presión del comando antes de soltar los enganches rápidos y al hacer cualquier verificación en el circuito hidráulico.

05.03.03.1840

## Sticker set

| Model    | Sticker          | Serial number |
|----------|------------------|---------------|
| GAPCW-EP | GAPCW-EP sticker | 05.03.03.4603 |
|          | Logo sticker     | 05.03.03.3933 |

# Data sheet

Type: ..... Stubble Disc-Hinge Wheel Offset

Model: ..... GAPCW - EP

Spacing between disc blades (mm): ..... 340

Disc blades dimension: ..... Ø 30" x 7.5 mm  
 ..... Ø 32" x 9 mm  
 ..... Ø 32" x 12 mm

Number of disc blades: ..... 30, 32, 34 and 40

Disc blades type: ..... Concave notched

Bearings - Length: ..... 330 mm  
 - Type: ..... Regreasable roller bearings

Oil volume on the bearings: ..... 600 ml

Spacer spools - Length: ..... 330 mm  
 - Type: ..... Cast

Axle diameter: ..... Ø 54 mm (2.1/8")

Hitching type (work): ..... Drawbar

Hitching type (transportation): ..... Three-point hitch

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

Transport speed: ..... 20 Km/h

Tires: ..... 400/60-15,5-T404-14L TRELEBORG tire (50 PSI)

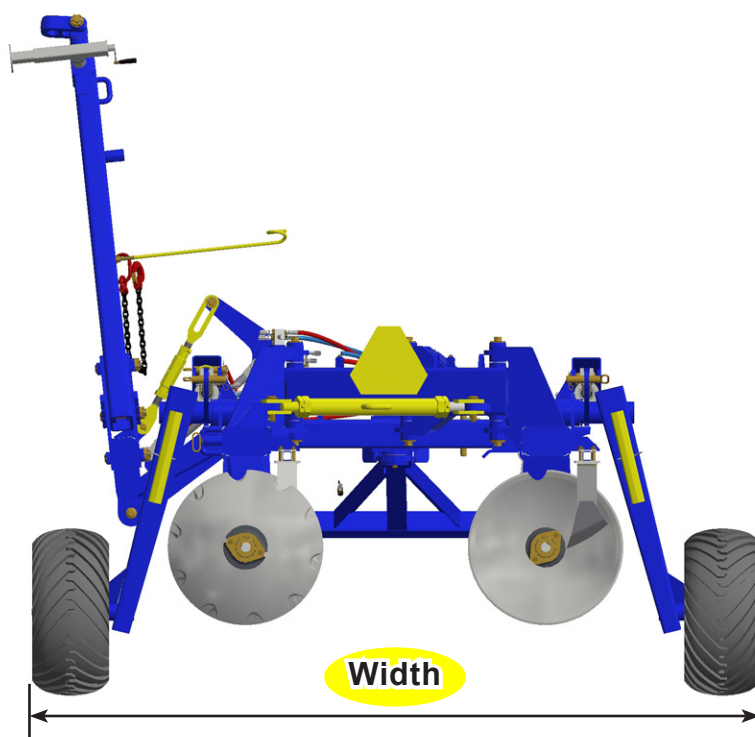
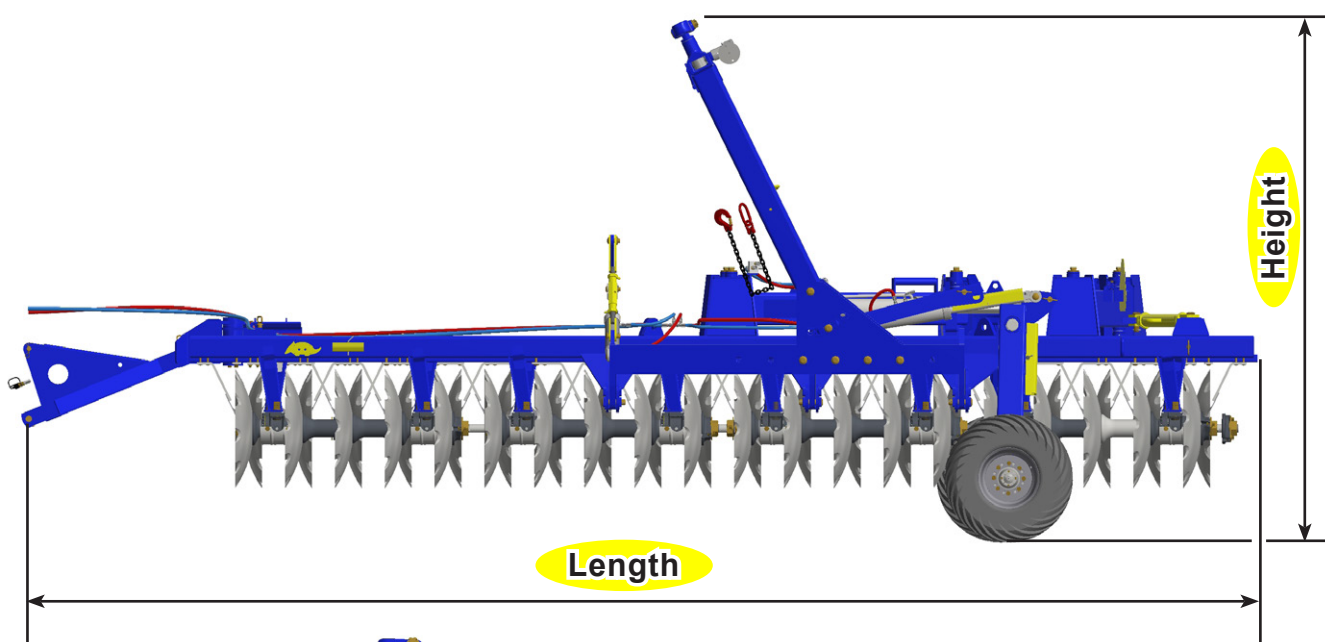
| Model       | Number of disc blades | Cutting width (mm) | Disc blades                                     |         | Weight (kg) | Tractor required (cv) |
|-------------|-----------------------|--------------------|---|---------|-------------|-----------------------|
|             |                       |                    | Dimensions                                      | Spacing |             |                       |
| GAPCW<br>EP | 30                    | 4877               | 30"x 7.5 mm,<br>32" x 9 mm<br>or<br>32" x 12 mm | 340 mm  | 6697        | 260 - 280             |
|             | 32                    | 5182               |   |         | 6851        | 280 - 300             |
|             | 34                    | 5486               |   |         | 7132        | 310 - 330             |
|             | 40                    | 6096               |   |         | 8146        | 350 - 370             |

\* The weights above were obtained using Ø 32" x 9 mm disc blades.

# Data sheet

## GAPCW-EP dimensions while in transport position

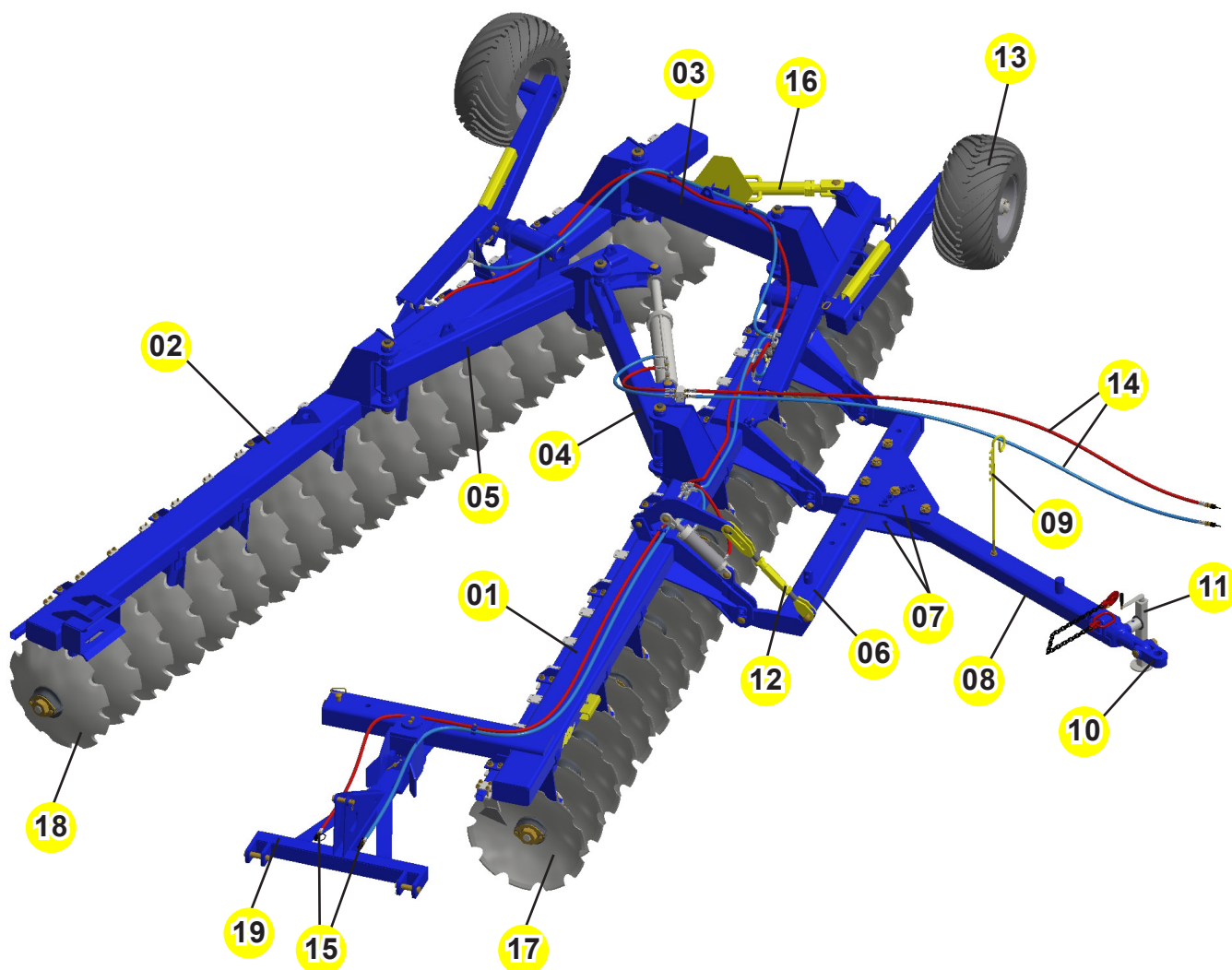
|         |                         |          |
|---------|-------------------------|----------|
| Height: | .....                   | 2,100 mm |
| Width:  | .....                   | 3,820 mm |
| Length: | - 30 disc blades: ..... | 6,700 mm |
|         | - 32 disc blades: ..... | 7,035 mm |
|         | - 34 disc blades: ..... | 7,370 mm |
|         | - 40 disc blades: ..... | 8,140 mm |



# Components

## GAPCW - EP

- 01 - Front frame
- 02 - Rear frame
- 03 - Junction
- 04 - Front stabilizer bar
- 05 - Rear stabilizer bar
- 06 - Hitch bar
- 07 - Upper and lower plates
- 08 - Drawbar
- 09 - Hose support
- 10 - Tractor hitch
- 11 - Parking stand
- 12 - Drawbar articulator
- 13 - Wheelsets
- 14 - Hydraulic circuit for opening
- 15 - Wheelset hydraulic circuit
- 16 - Junction extensor
- 17 - Front disc gang
- 18 - Rear disc gang
- 19 - Drawbar for transportation



# Assembly

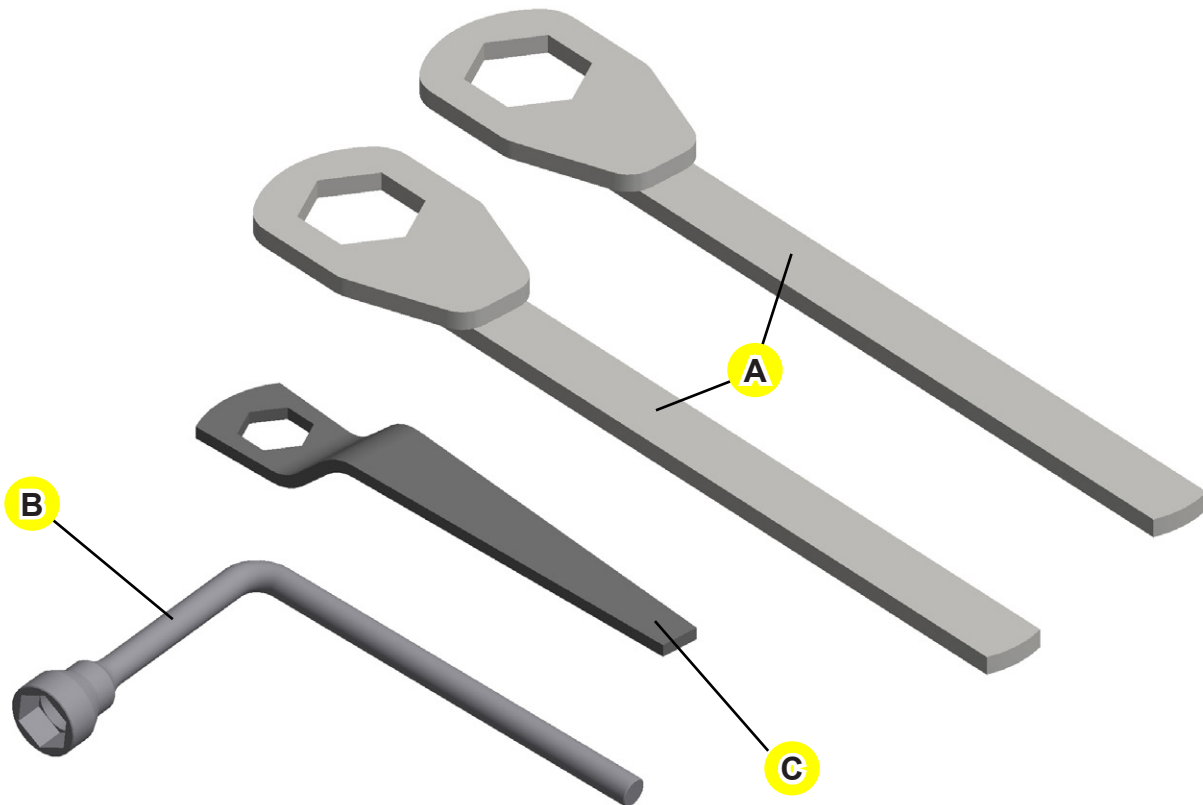
First of all, put the parts in a clean place to identify them easier. Check the parts using the list that comes inside the packing box.

## 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 tightens the nut to the other end, thereby preventing the axle from rotating.

Use the box end wrench (B) to tighten the nuts on the bearing bolts.

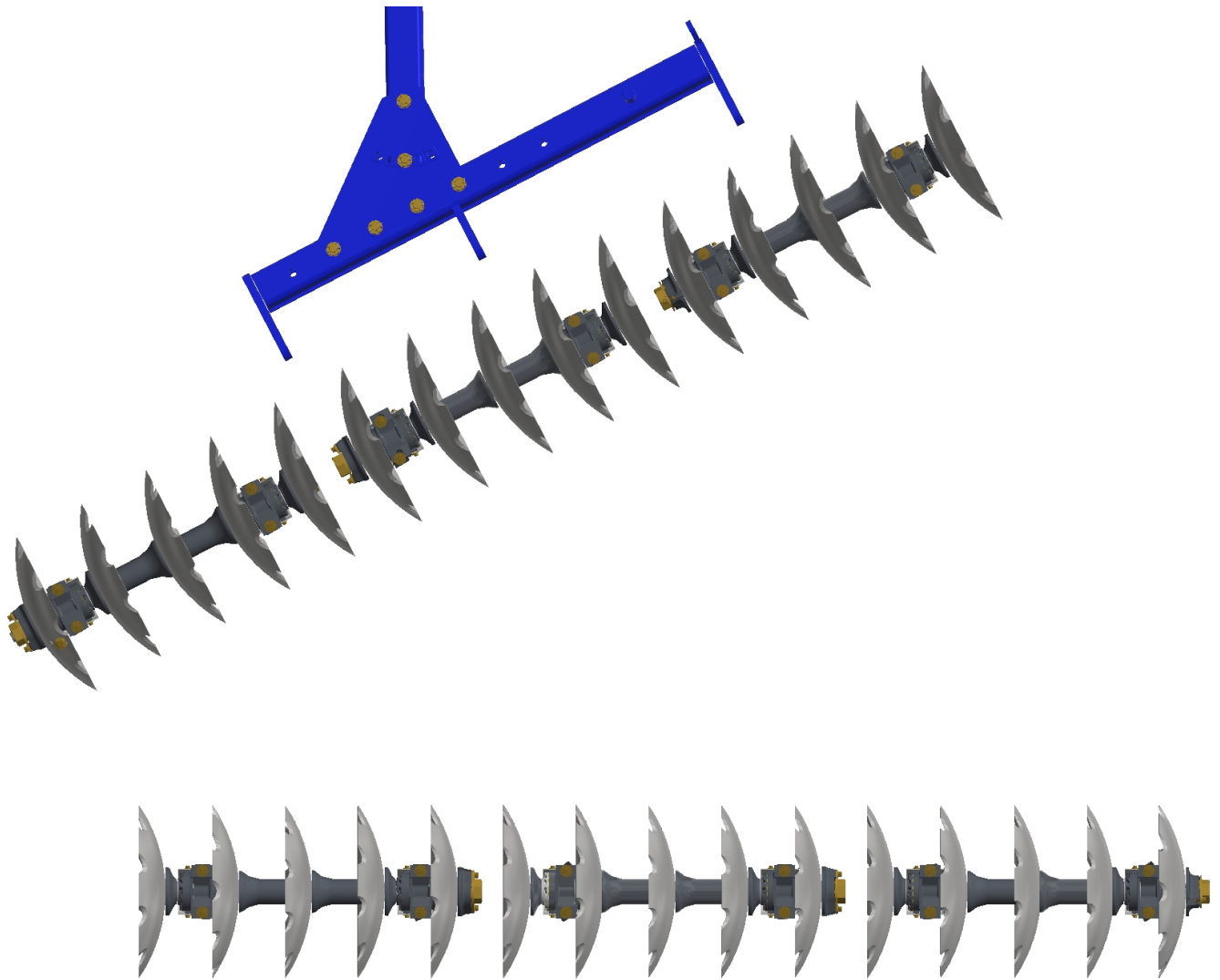
Use the box end wrench (C) to tighten the nuts on the traction set.



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

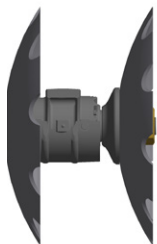
# Assembly

## Assembly of bearings and spacer spools



**GAPCW - EP**  
**30 disc blades**  
**12 bearings**  
**12 spacer spools**

**Bearing**



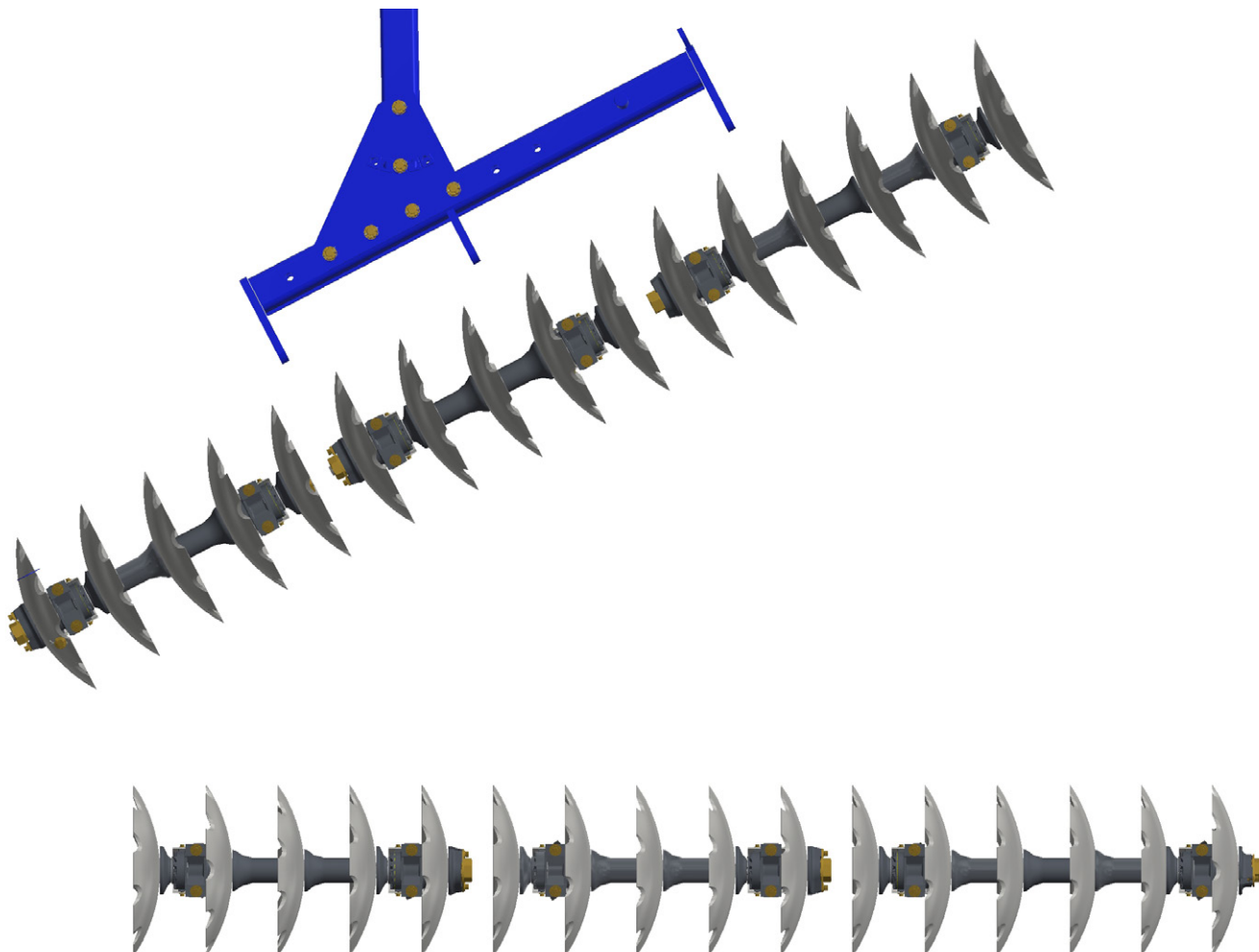
**Spacer spool**





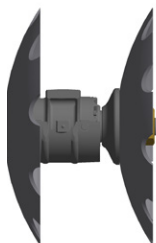
# Assembly

## Assembly of bearings and spacer spools



**GAPCW - EP**  
**32 disc blades**  
**12 bearings**  
**14 spacer spools**

**Bearing**

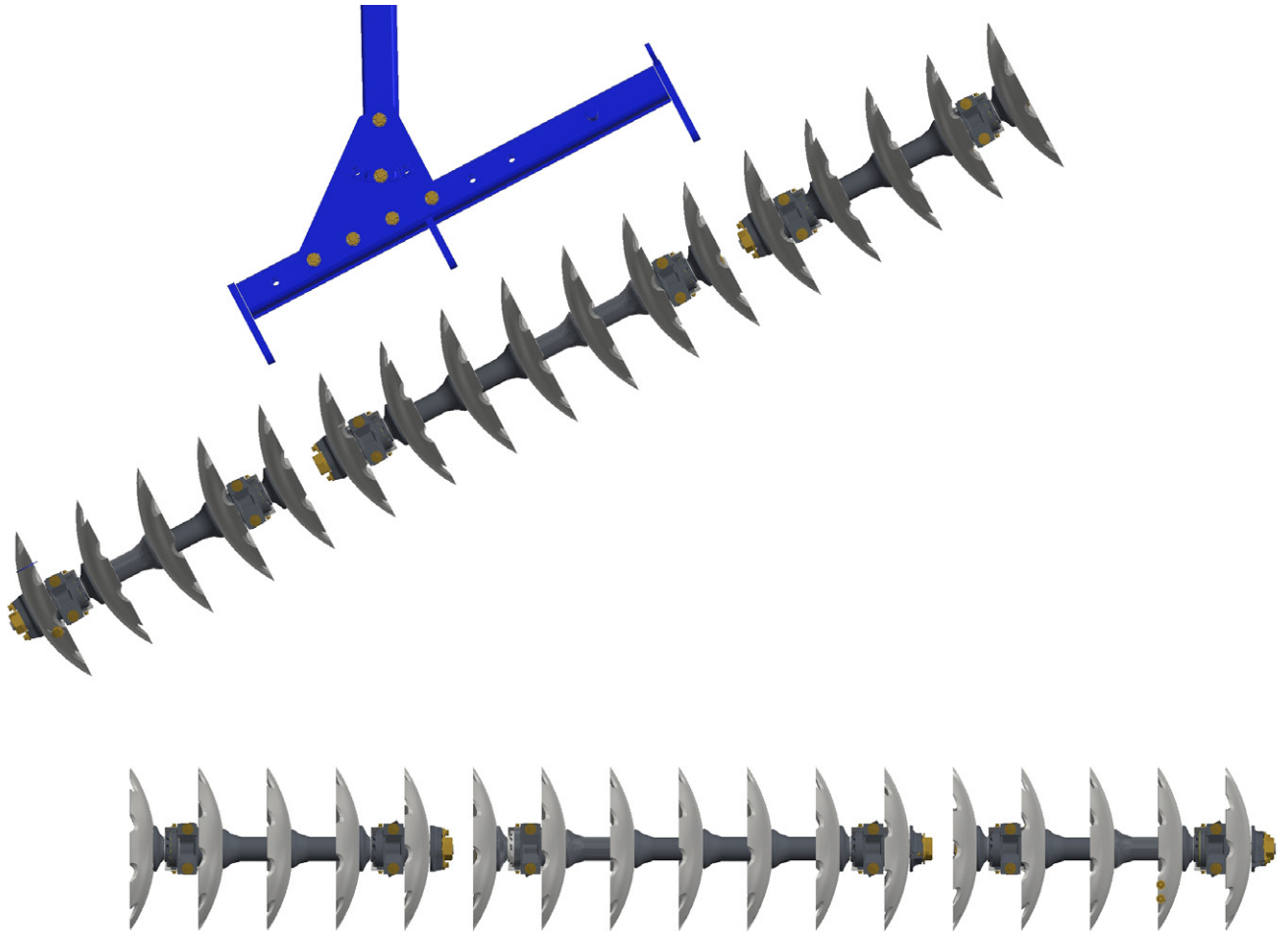


**Spacer spool**



# Assembly

## Assembly of bearings and spacer spools



**GAPCW - EP**  
**34 disc blades**  
**12 bearings**  
**16 spacer spools**

**Bearing**

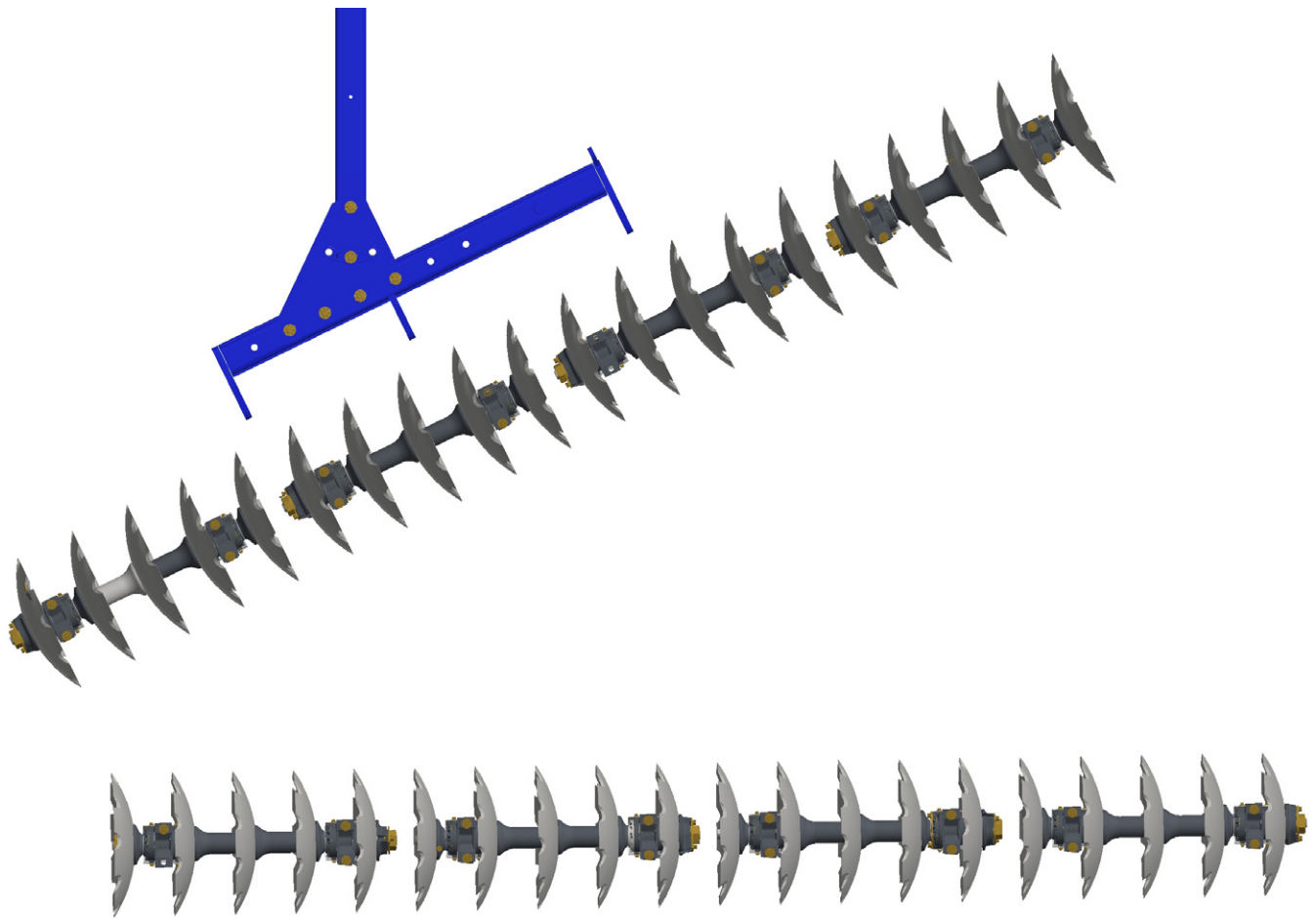


**Spacer spool**



# Assembly

## Assembly of bearings and spacer spools



**GAPCW - EP**  
**40 disc blades**  
**16 bearings**  
**16 spacer spools**

**Bearing**



**Spacer spool**



# Assembly

## Disc gangs assembly sequence

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

Place the nut (C) passing 5 mm from the axle face.

Place the disc blades (D), bearings (E) and spacer spools (F), following the instructions on pages 14 to 17.

Place the inner lock (G) and nut (C-1).

Place the bolt (H) that fasten the nut lock (I), along with a spring washer and nut. (Only on the outer side of the gangs).

Use the wrenches from page 13 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. (Figure on page 19).

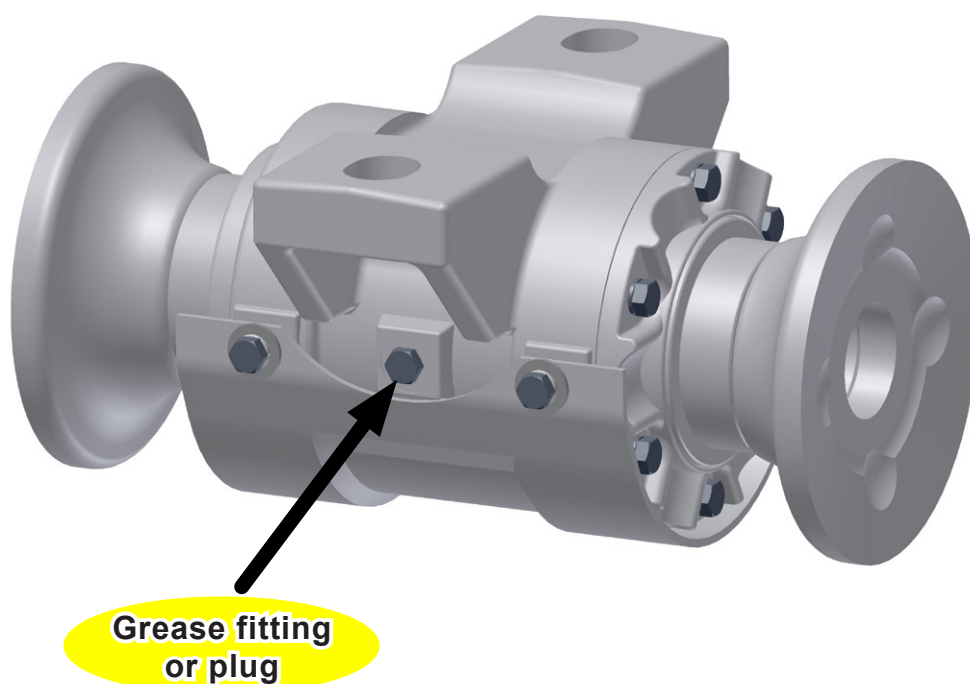
2) On the inner side, use the other wrench and tighten the gangs to get maximum torque.

3) To tighten, the gangs must remain underpinned with a piece of wood or another object, preventing them from moving. (Figure on page 19).

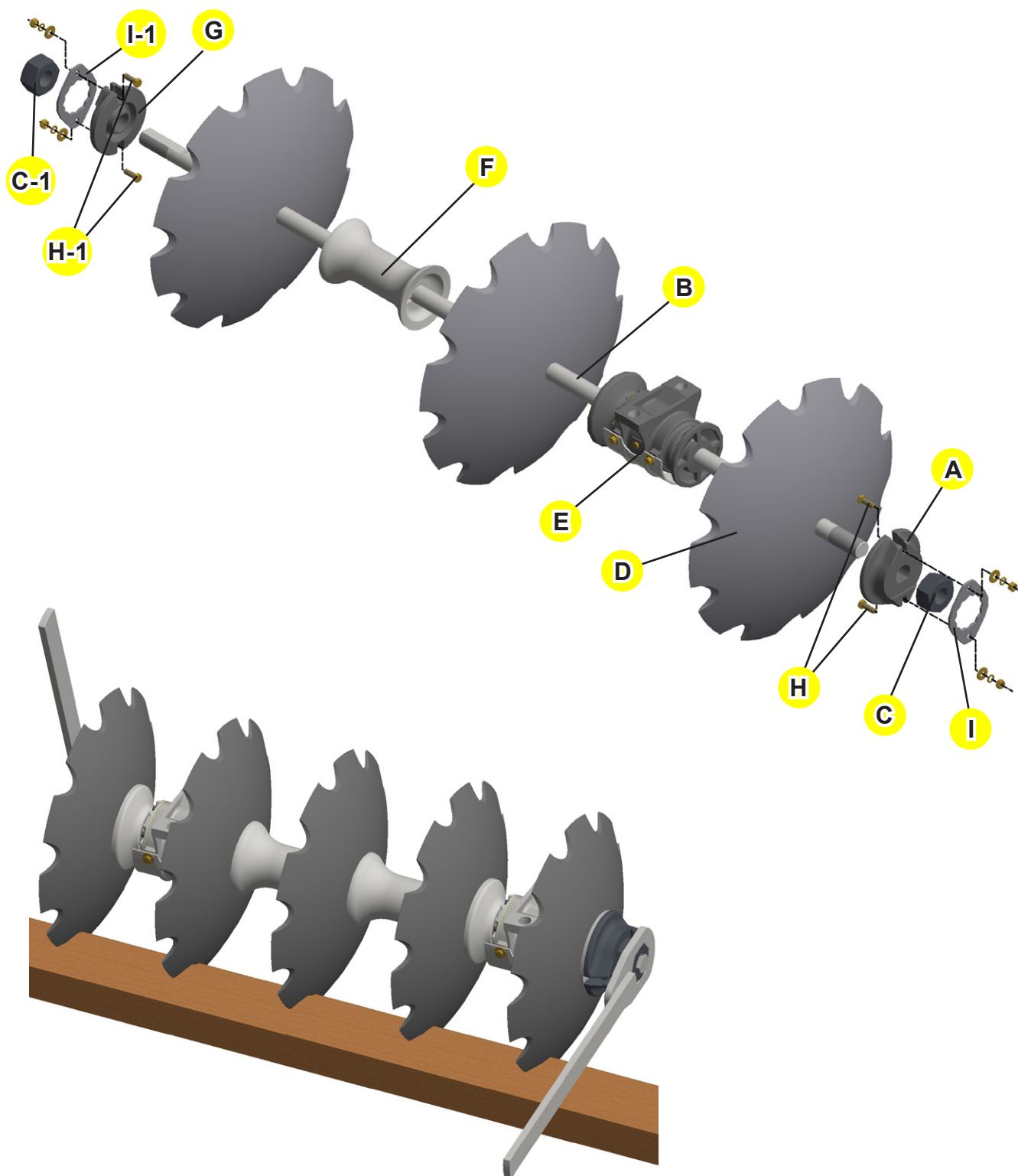
Lastly, place the bolt (H-1) and position the lock nut (I-1), fastening with a spring washer and nut.

### IMPORTANT

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



# Assembly



| Axle torque   |            |
|---------------|------------|
| Axle diameter | Ft. - lbs. |
| 1.1/2"        | 2670       |
| 1.5/8"        | 2890       |
| 2.1/8"        | 3300       |
| 2.1/2"        | 3500       |

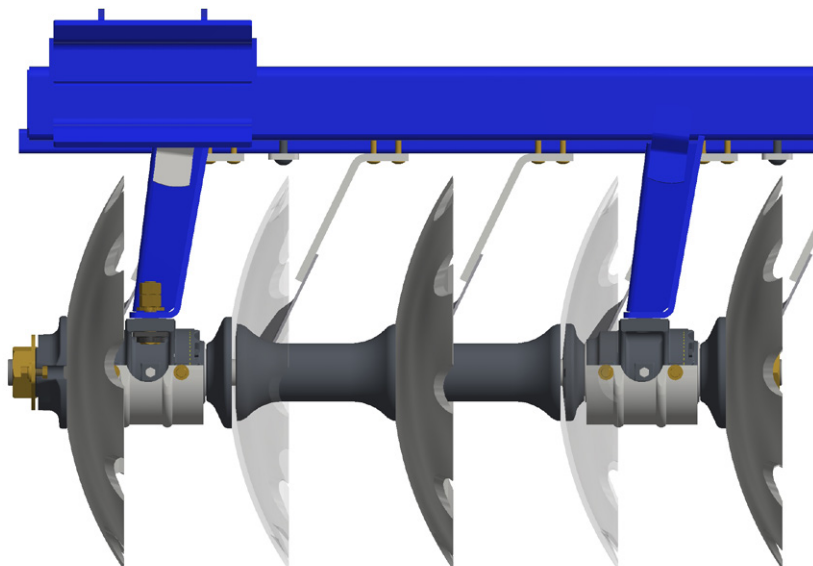
**NOTE** The axle threads (B) must be greased before assembling them.  
Consult torque table on page 53.

# Assembly

## 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. (See figure on pages from 14 to 17).

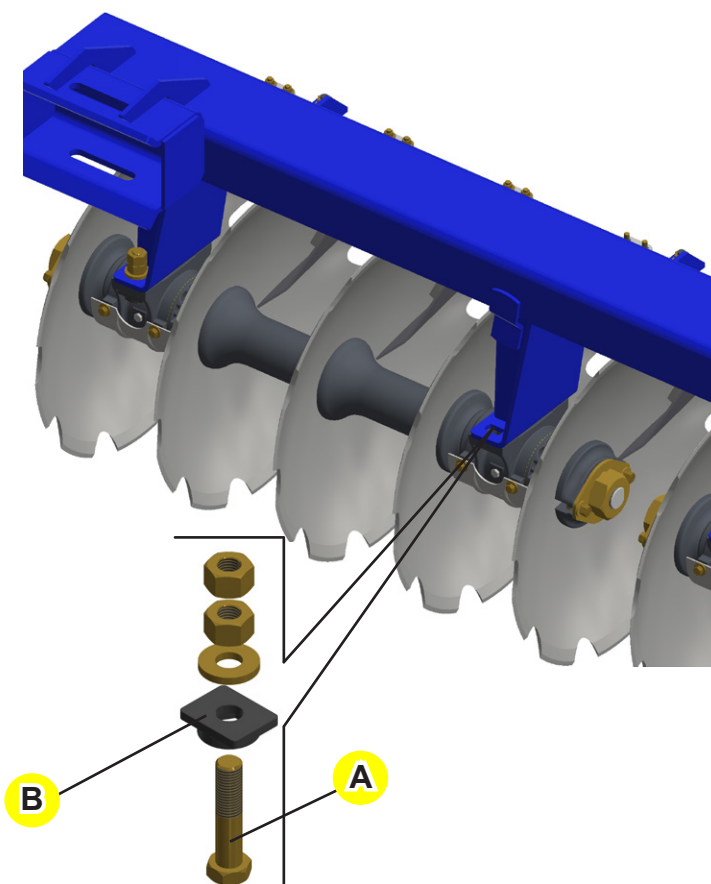


In the gang assembly to the carriers, the bearing hangers should remain facing the disc blades concavity.

Place a bolt (A) with square washer (B) and pass it through the bearing and the bearing hanger hole. On top, place a flat washer, nut and counter nut. Do not totally tighten it yet.

Repeat this operation for other bearings.

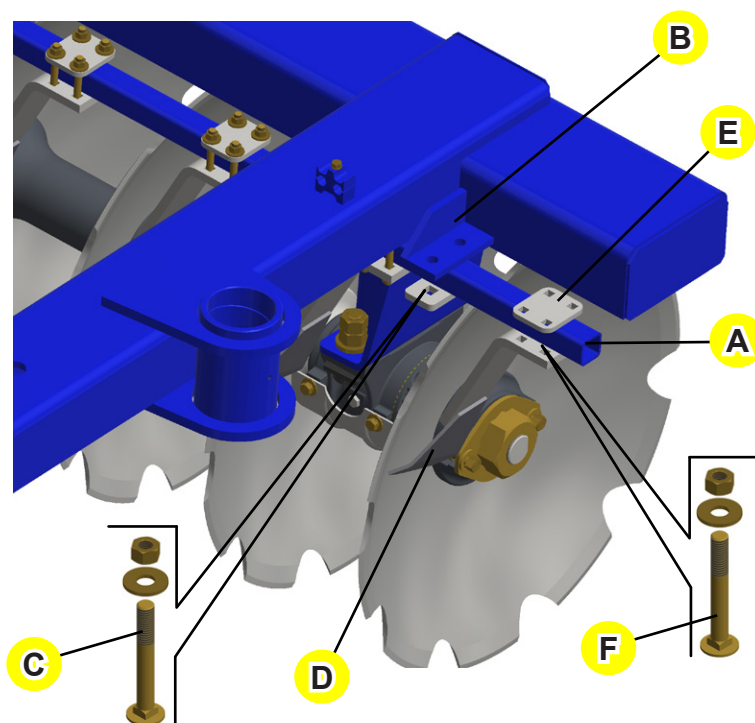
As an assemble option, it is possible to place the frames on the ground with the bearing hangers facing upwards and then lower the disc gangs individually.



# Assembly

## Scrapers assembly

Couple the fixation tube (A) to the frame using the plates (B), bolts (C), flat washers and nuts. Right after, assemble the scrapers (D) with the plates (E) that are coupled to the fixation tube (A) using bolts (F), flat washers and nuts.



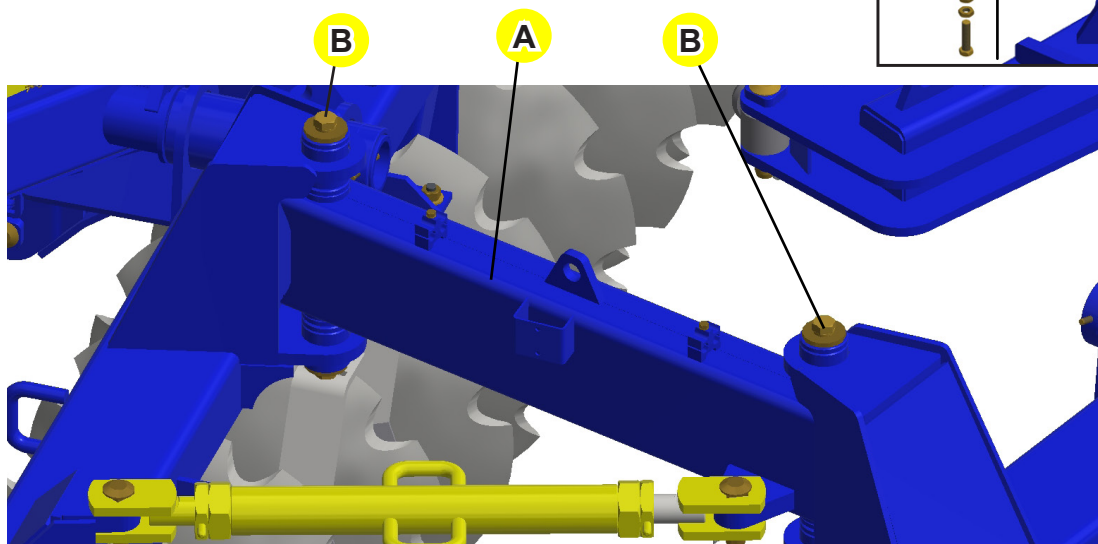
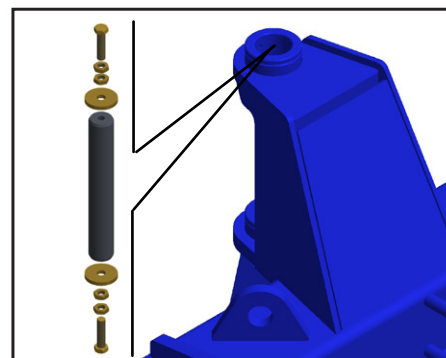
### NOTE

The scrapers feature an adjustment to approach or distance them from the disc blades, on a range from 10 to 20 mm.

## Frame junction assembly

Approach the frames with disc gangs and assemble the junction (A) with the axles (B), flat washers, spring washers and bolts.

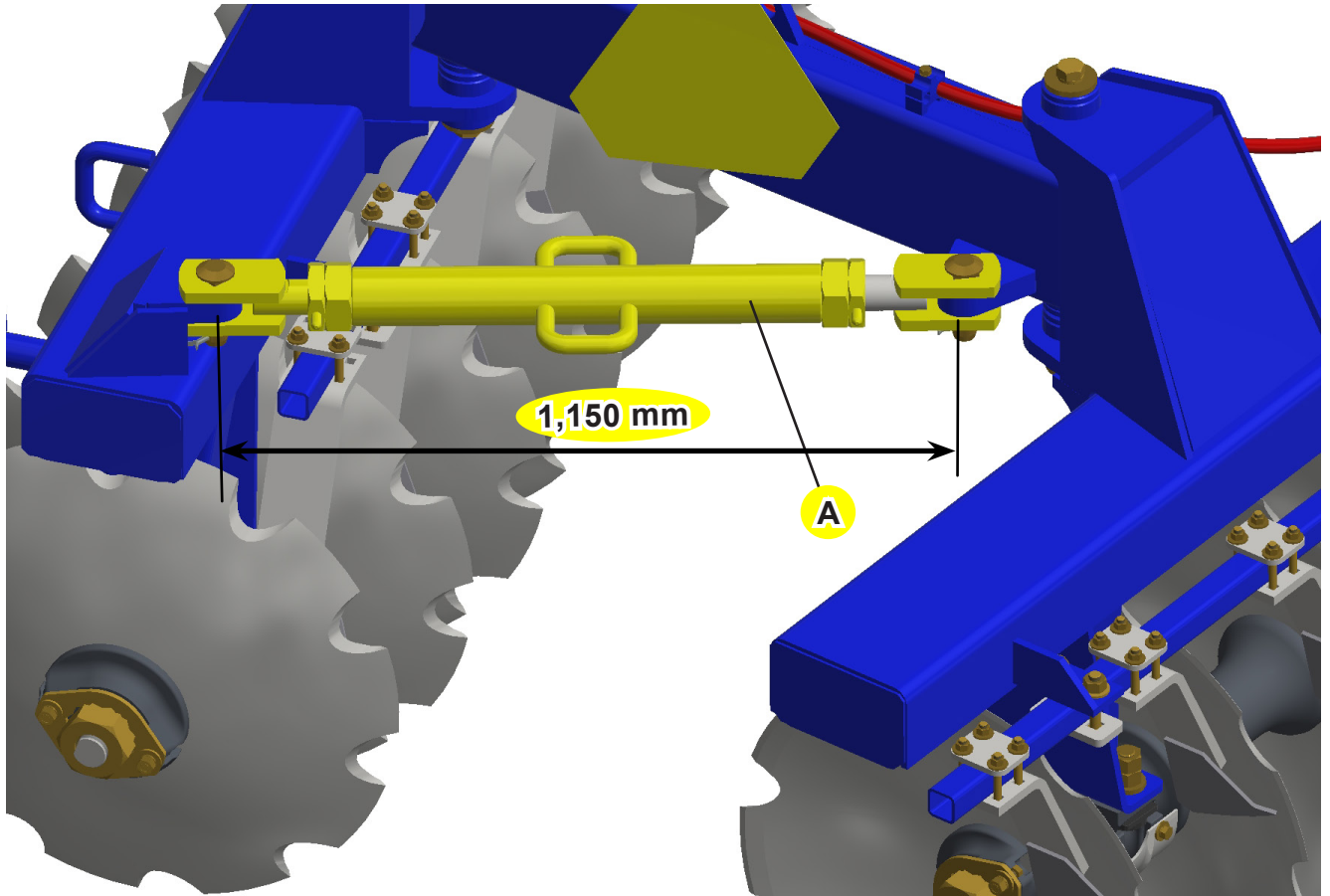
After joining the frames, totally tighten the nuts of the bearing bolts, which fasten the disc gangs.



# Assembly

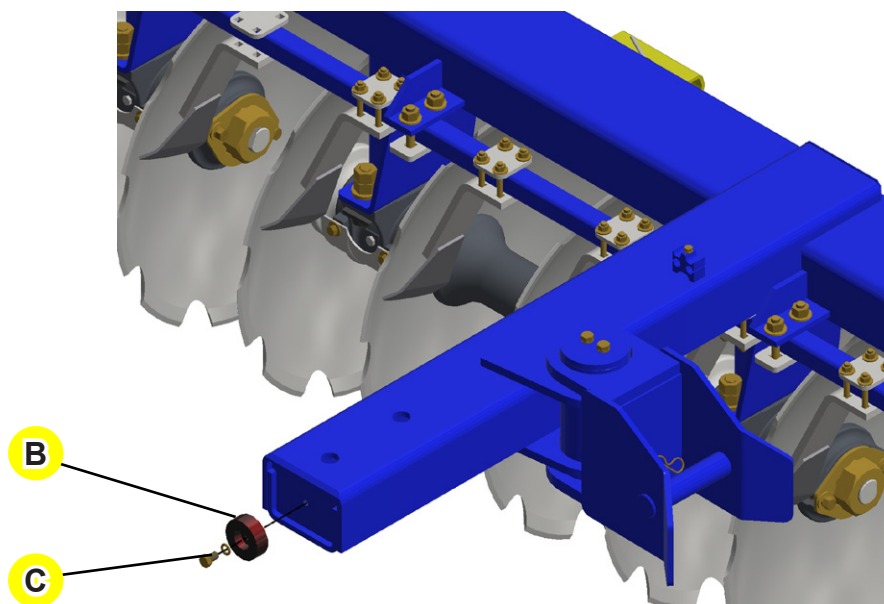
## Junction extension assembly

Install the junction extension (A), divide the thread center to center and determine a length of **1,150 mm** (115 cm) from the center of the fixation pins.



## Shock absorber assembly

Install the shock absorber (B) to the front frame using a bolt (C) and spring washer.

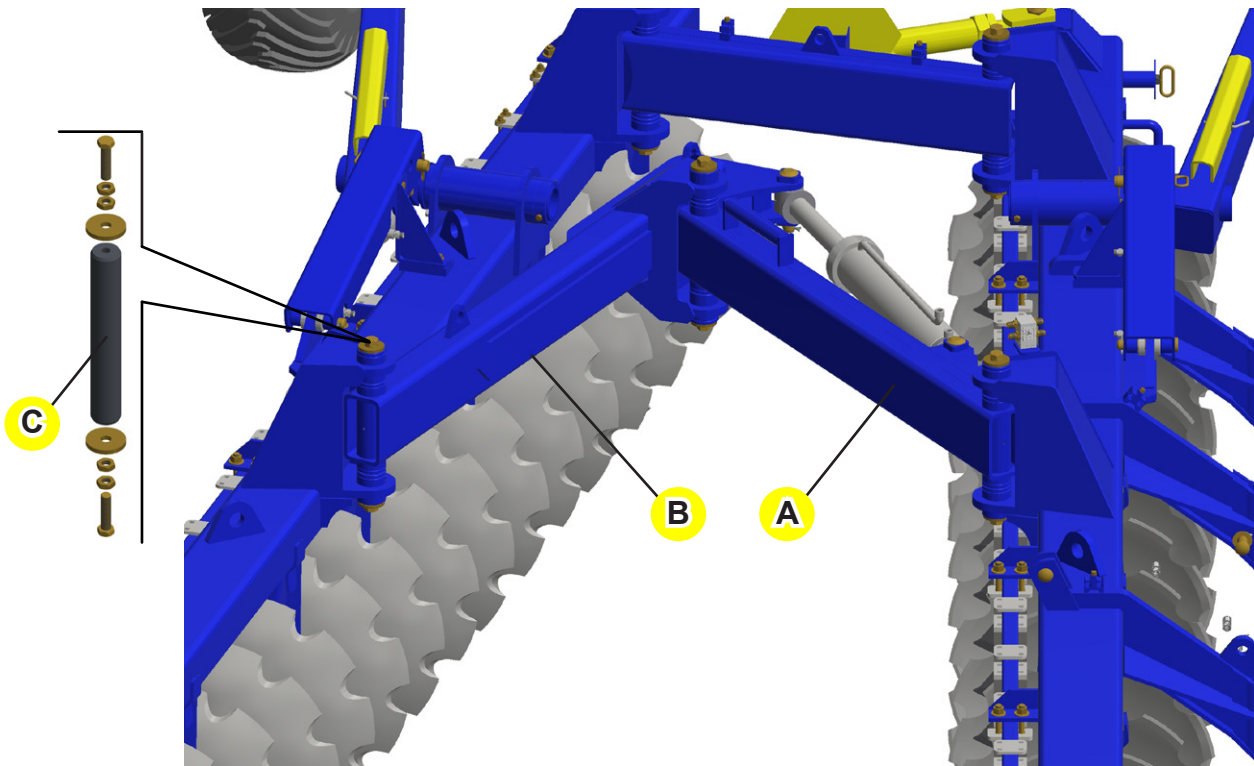




# Assembly

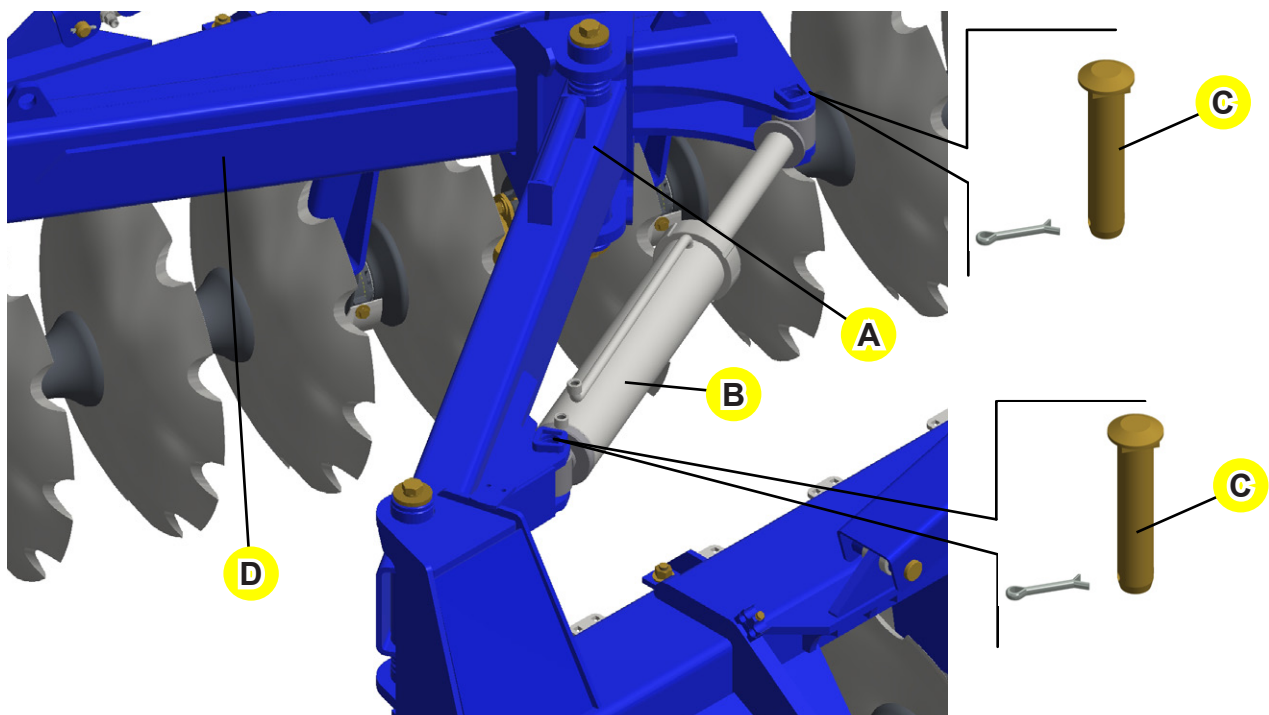
## Front and rear stabilizer bars assembly

Install the front (A) and rear (B) stabilizer bars using axles (C), flat washers, spring washers and bolts.



## Stabilizer bars cylinder assembly

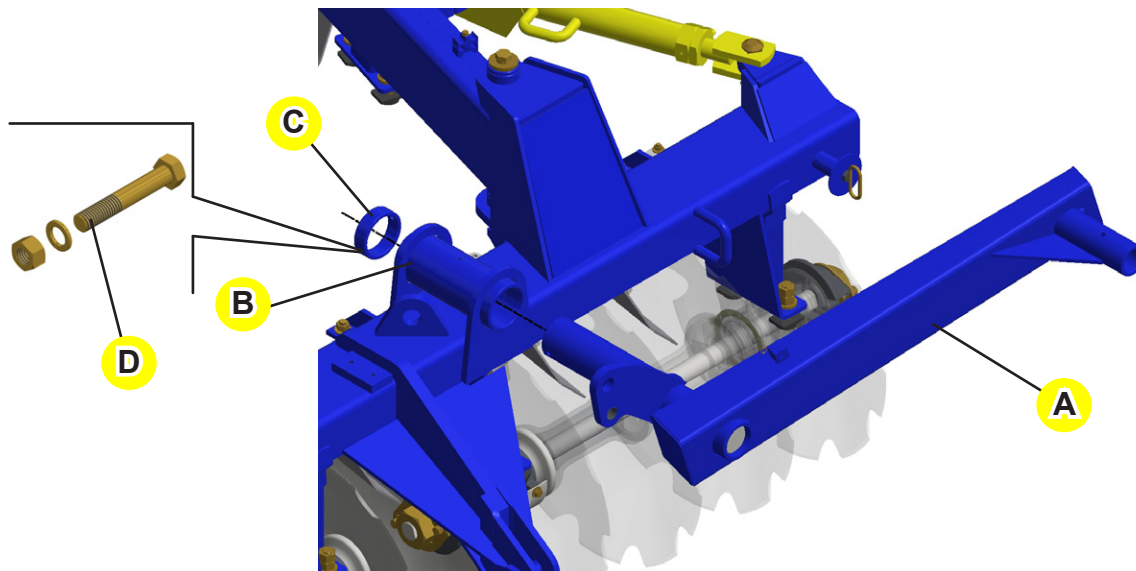
In the front stabilizer (A), install the hydraulic cylinder (B) and fasten using a junction axle (C) and cotter pin. In the cylinder rod, install the rear stabilizer bar (D) and couple it using a junction axle (C) and cotter pin.



# Assembly

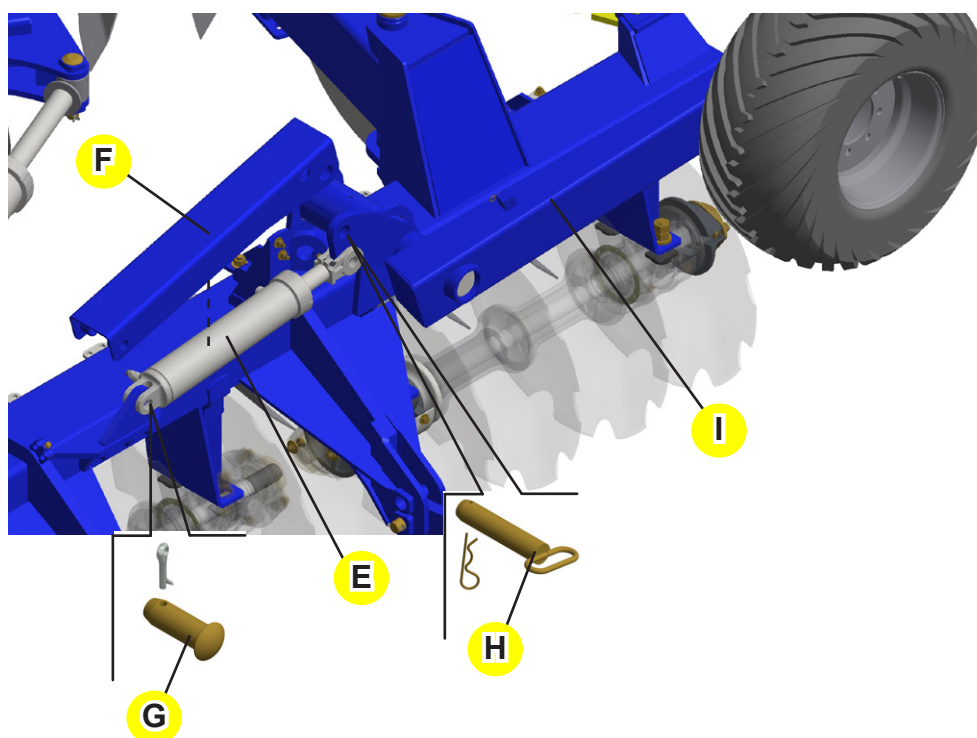
## Assembly of the wheelset arms

Install the wheelset arms (A) to the bushings (B) using a ring (C), bolts (D), spring washers and nuts.



## Wheelset locks and cylinders assembly

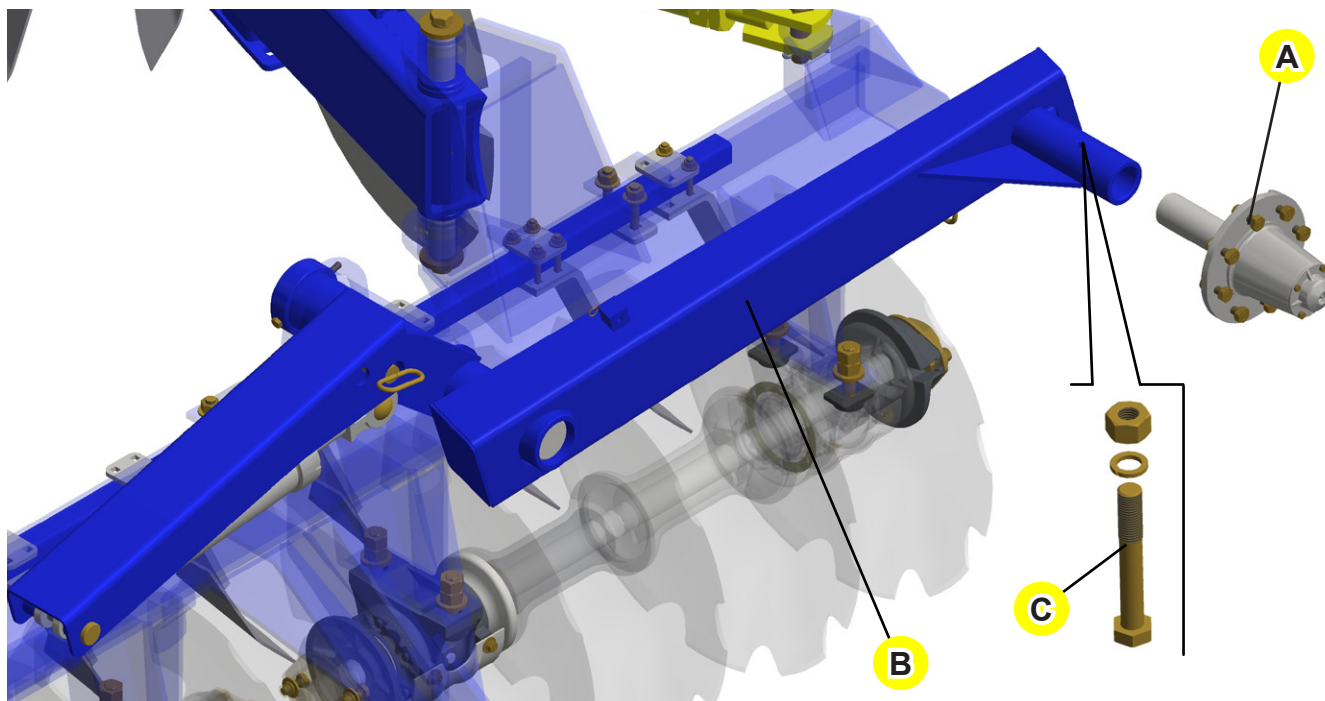
Install the wheelset cylinders (E), along with the locks (F) using an axle (G), cotter pin and axle (H) and the cotter pin that locks the wheelset arm (I) in a lifted position.



# Assembly

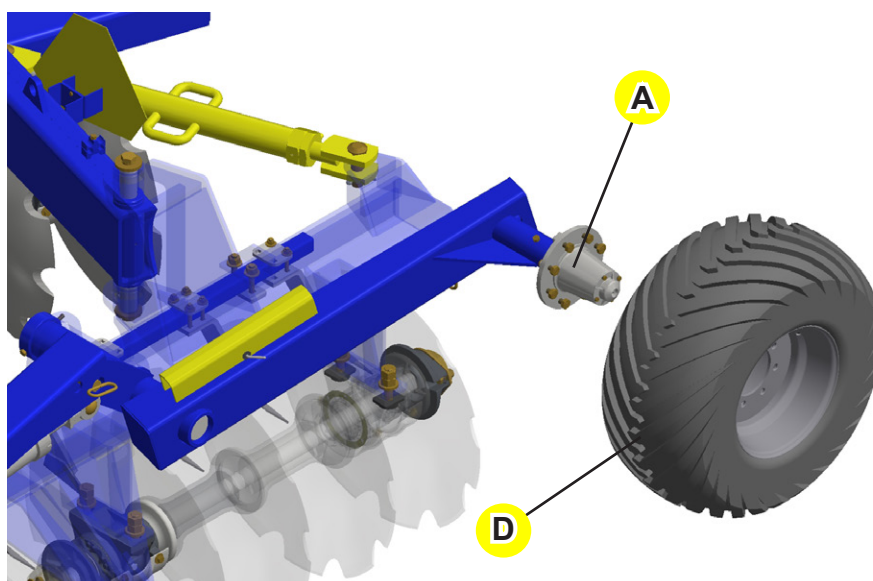
## Assembling the hubs to the wheelset arms

Install the hubs (A) to the wheelset arms (B) using a bolt (C), spring washer and nut.



## Tires assembly

Install the tires (D) on the hubs (A), using the nuts fixed on the hubs.



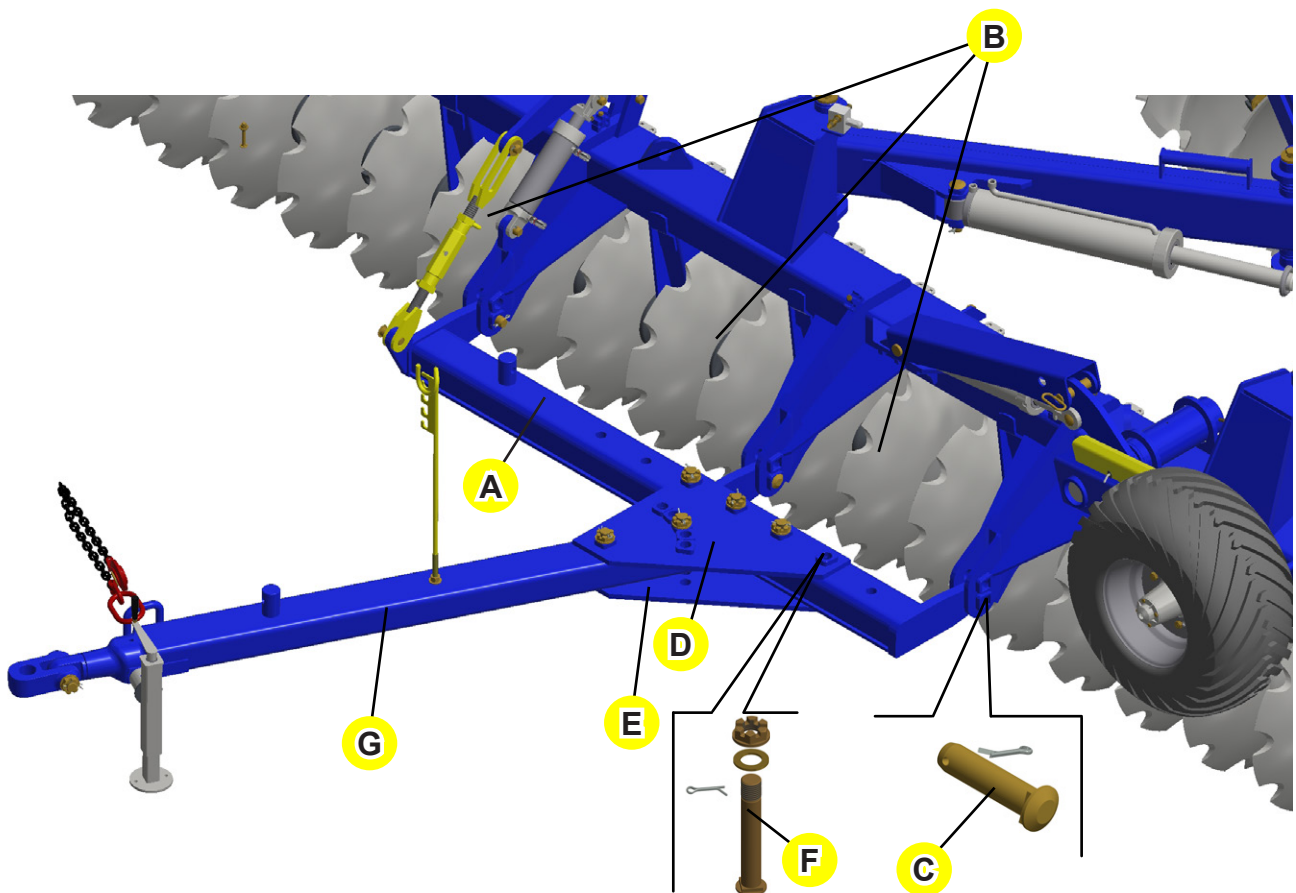
# Assembly

## Traction set assembly

Couple the hitch bar (A) to the frame arms (B) using a junction axle (C) and cotter pin.

Assemble the upper (D) and lower (E) plates, carefully observing their correct position. Avoid to put them inverted and lock them using an axle (F), flat washer, castle nut and cotter pin.

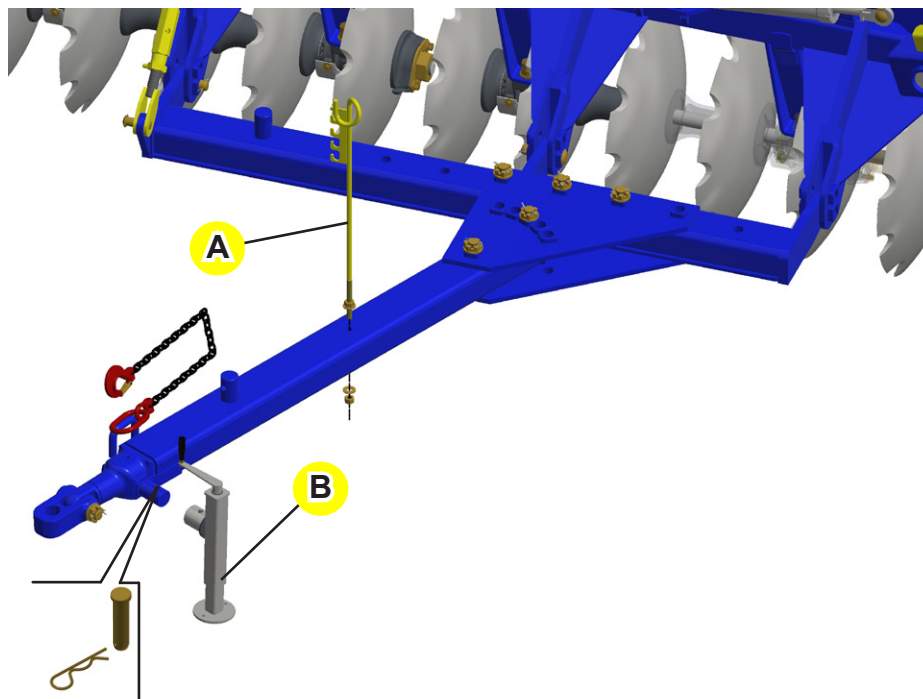
Assemble the drawbar (G) and fasten it using an axle (F), flat washer, castle nut and cotter pin.



# Assembly

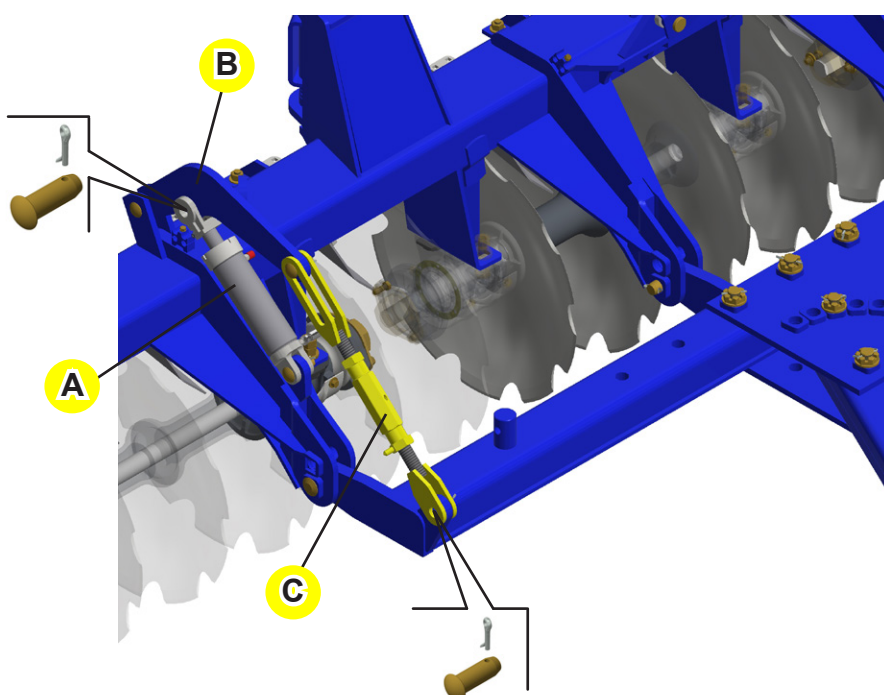
## Hose support and parking stand assembly

Install the hose support (A) using flat washers and nuts; install the parking stand (B) using an axle and cotter pin.



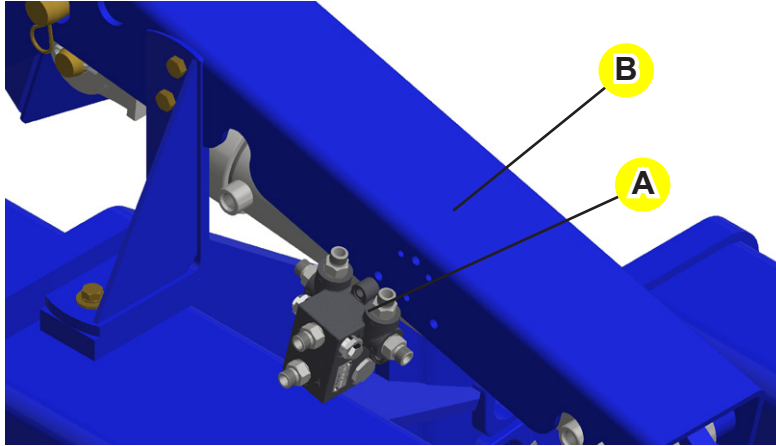
## Drawbar articulation set assembly

Assemble the hydraulic cylinder (A), the articulator (B) and the extensor (C), with their respective axles and cotter pins.

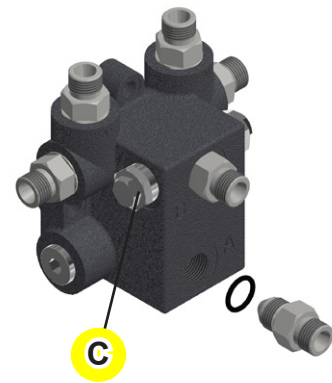


# Assembly

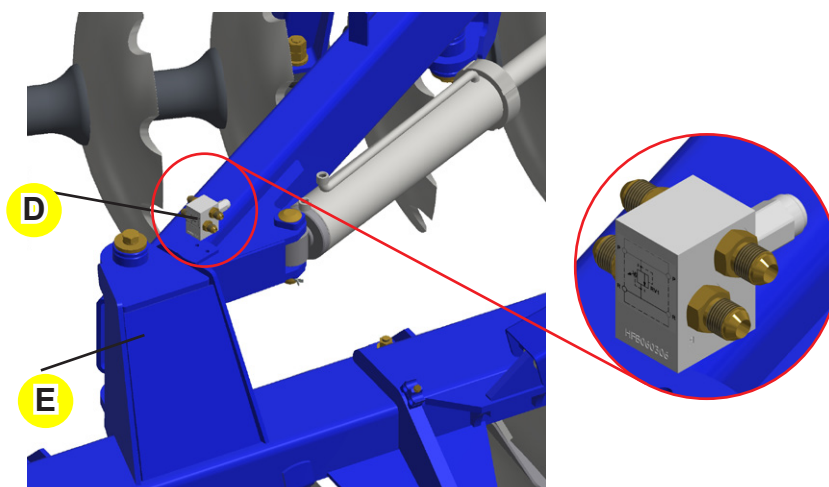
## Hydraulic circuit valves assembly



Fasten the flow divider valve (A) to the front safety lock (B) using a bolt, spring washer and nut.



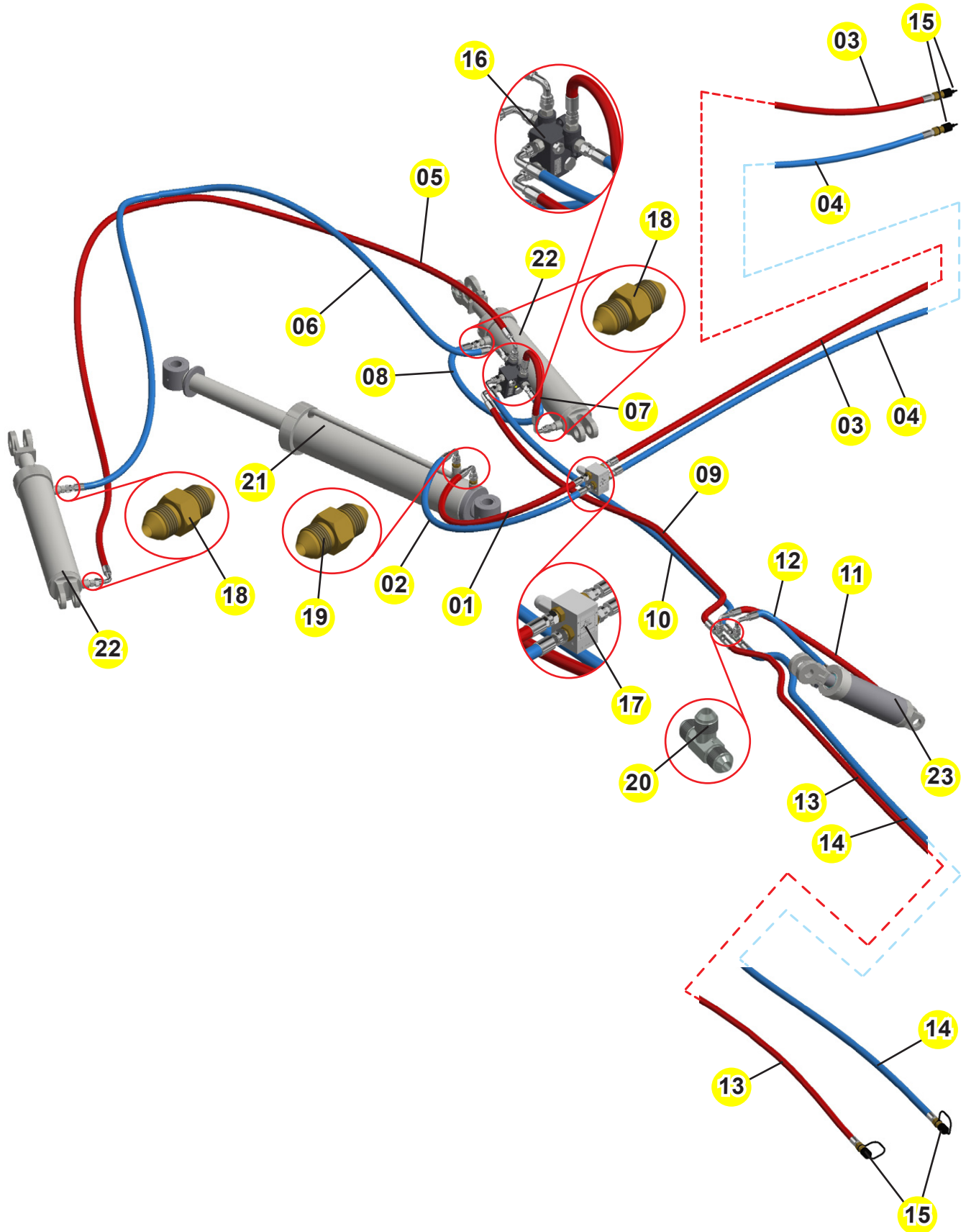
If the valve has an inner flow reductor (C) on one of the nipples, remove it before assembling the valve to the harrow.



Install the unload valve (D) to the front frame (E) using a bolt and spring washer.

# Assembly

## Hydraulic circuit assembly



# Assembly

## Hydraulic circuit

| Number | Description                             | Qty.        |
|--------|---|-------------|
| 01     | 1/2" x 800 TR-TC hose                   | Pressure 01 |
| 02     | 1/2" x 900 TR-TC hose                   | Return 01   |
| 03     | 1/2" x 5500 TR-TM hose                  | Pressure 01 |
| 04     | 1/2" x 5500 TR-TM hose                  | Return 01   |
| 05     | 3/8" x 4000 TC-TC hose                  | Pressure 01 |
| 06     | 3/8" x 3600 TR-TC hose                  | Return 01   |
| 07     | 3/8" x 450 TR-TC hose                   | Pressure 01 |
| 08     | 3/8" x 450 TC-TC hose                   | Return 01   |
| 09     | 3/8" x 1900 TR-TC hose                  | Pressure 01 |
| 10     | 3/8" x 1900 TR-TC hose                  | Return 01   |
| 11     | 3/8" x 600 TR-TC hose                   | Pressure 01 |
| 12     | 3/8" x 450 TR-TC hose                   | Return 01   |
| 13     | 3/8" x 5500 TC-TM hose                  | Pressure 01 |
| 14     | 3/8" x 5500 TC-TM hose                  | Return 01   |
| 15     | Male quick coupler AGR 1/2 NPT with cap | 04          |
| 16     | Complete flow divider valve             | 01          |
| 17     | Relief valve with nipple                | 01          |
| 18     | Nipple 3/4"                             | 04          |
| 19     | Nipple 7/8"                             | 02          |
| 20     | Male connector T 3/4" UNF               | 02          |
| 21     | Opening hydraulic cylinder              | 01          |
| 22     | Wheelset hydraulic cylinder             | 02          |
| 23     | Drawbar hydraulic cylinder              | 01          |

**NOTE** Observe that there are two letters ("P" and "R") on the pressure adjustment valves, as shown in the figure. These hoses must never be inverted connected.

The hoses to be connected to the "P" port are responsible to close the hydraulic cylinder (rod side).

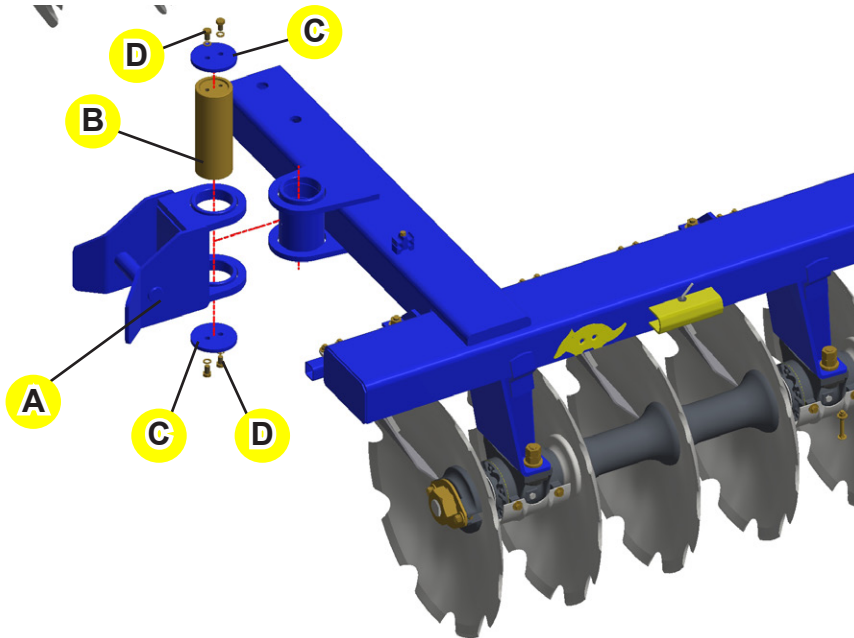
This valve function is to control the closing pressure of the hydraulic cylinder, in a way that the rod stops will not be crushed.



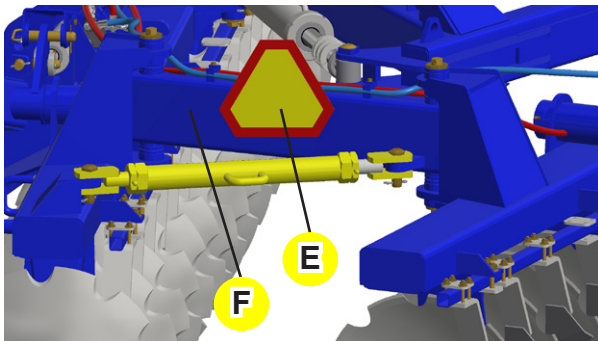
# Assembly

## Assembly of the hitch for transportation

Install the complement (A) of the transport drawbar using the lock bushing (B), fixation washers (C) and bolts (D) with spring washers.

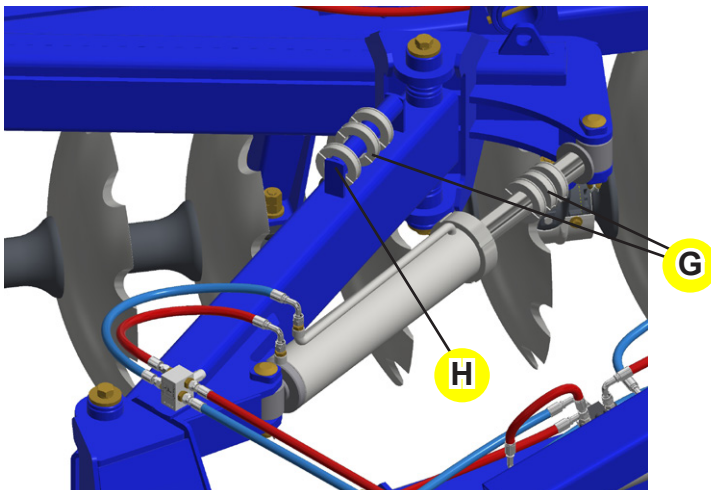


## Safety triangle assembly



Install the safety triangle (E) to the junction (F).

## Rod stops location



The rod stops (G) must be kept on their support (H) whenever they are not being used along with the opening cylinder rod.

# Set-up instructions

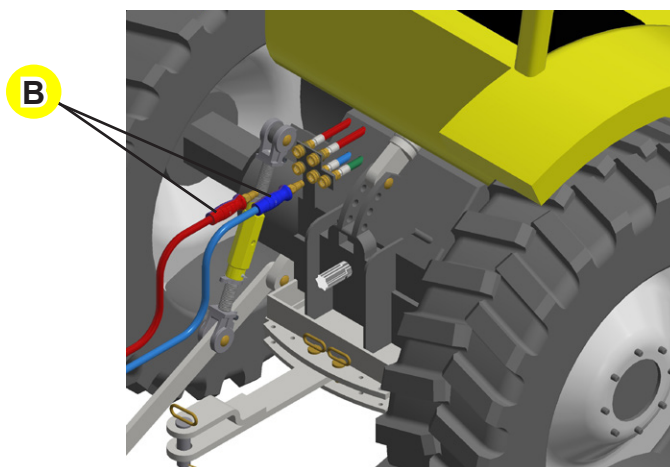
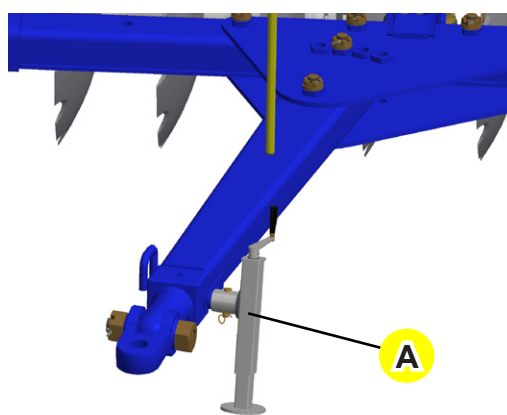
The following instructions should be carefully observed in order to maintain the best performance at work.

## Preparing the tractor

The addition of water ballasts in the tires and extra counterweights in the front or at the rear tractor wheels are the most useful ways to increase the traction in the soil and get larger stability to the tractor.

## Hitching to the tractor

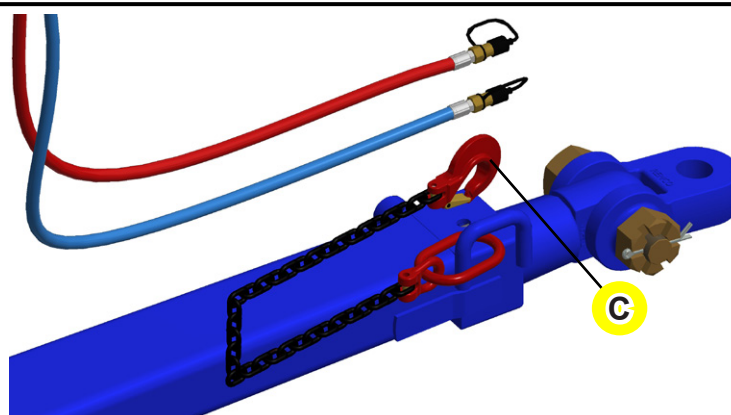
Couple the drawbar to the hitch bar using the proper locking. To facilitate hitching, use the parking stand (A) adjustment. Couple the hoses (B) to the outlet terminals, checking if the quick couplers are clean.



**NOTE** The tractor hitch pin is not included with the equipment.

## Safety chain

Always use the safety chain (C), which must be fixed to the tractor and to the harrow.



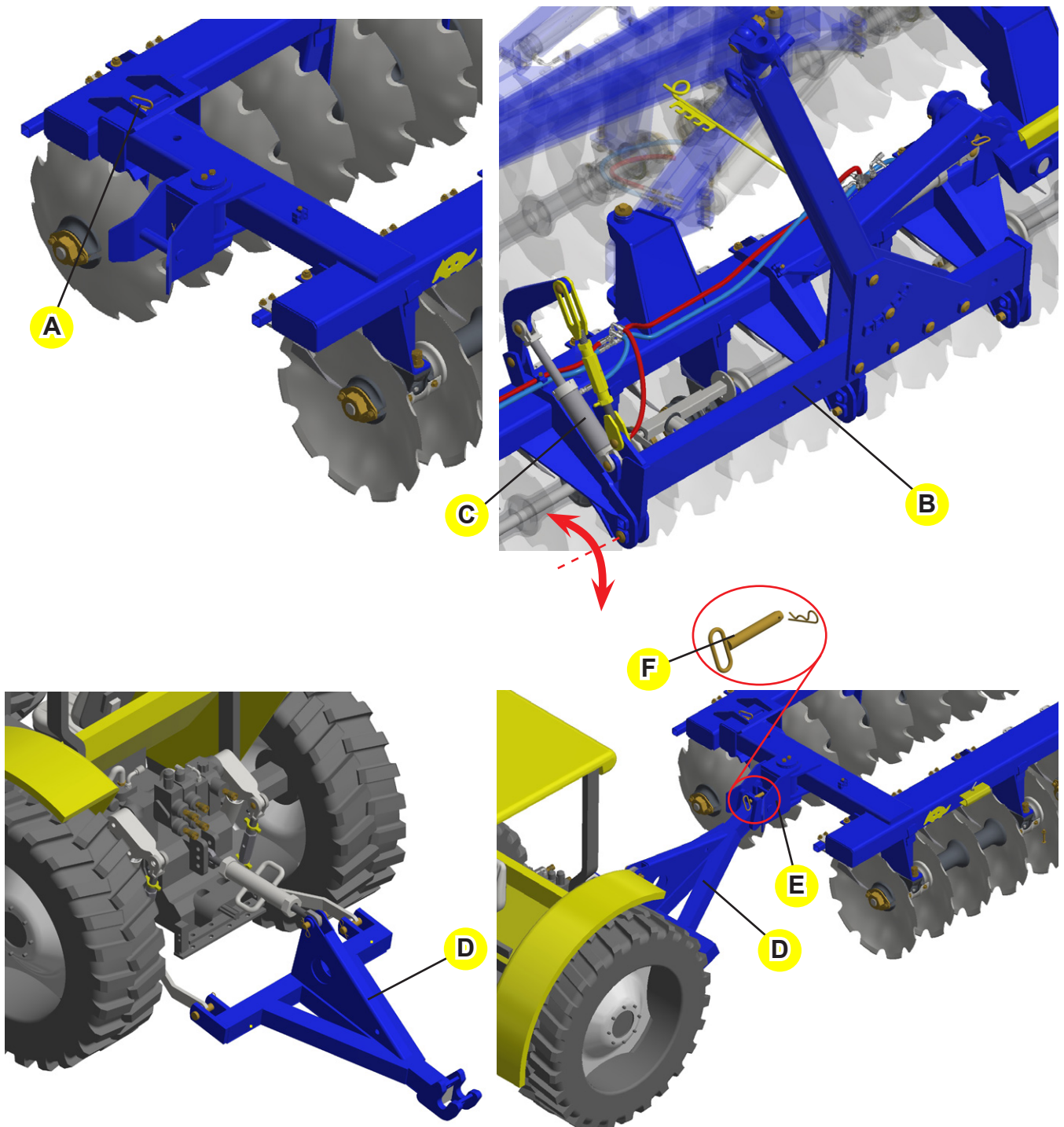
- ATTENTION**
- Before activating the hydraulic command to lower or lift the tires, check if there are no people close to the harrow, especially near the drawbar.
  - Do not allow that people or animals get closer to the equipment.
  - Never relieve or remove the hoses without relieving the control valve pressure.

# Set-up instructions

## Hitching to the tractor to transport the harrow

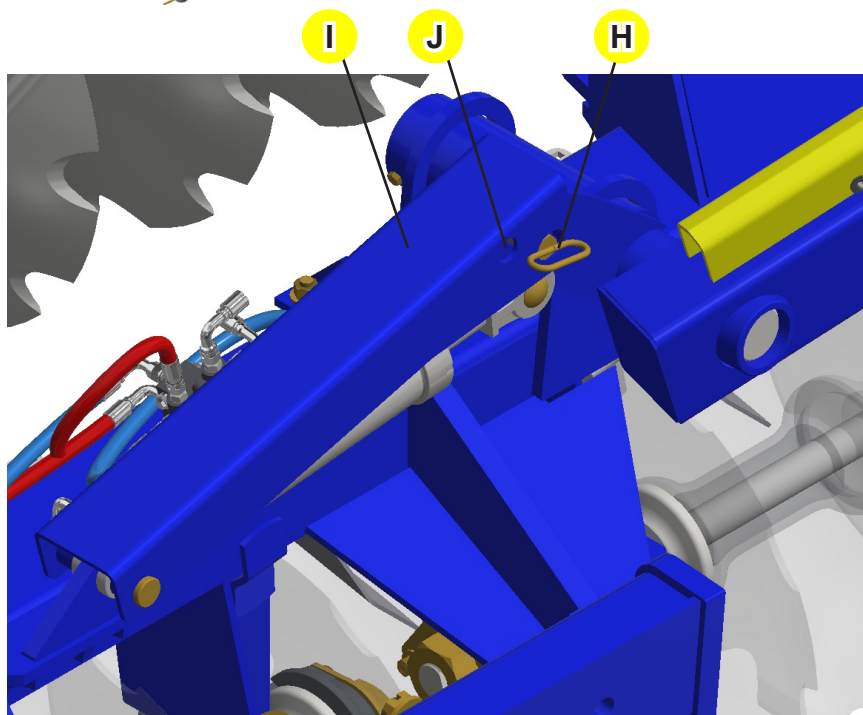
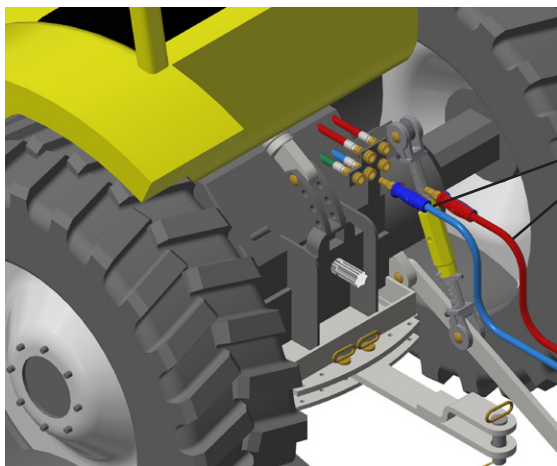
Being the harrow closed and locked with a pin (A) and cotter pin, proceed as follows:

- Articulate the drawbar (B) with the aid of the cylinder (C) until the transport position.
- Couple the transport hitch (D) to the tractor three points.
- Approach the tractor with hitch (D) and couple the transport drawbar (E), locking with a pin (F) and cotter pin.



## Set-up instructions

- Couple the hoses (G) that activate the wheelsets to the quick couplers of the tractor. To do so, shut down the engine, relieve the control valve pressure by activating the lever a couple of times and check if the couplers are cleaned.
- Remove the pins (H) from the safety locks (I). If necessary, activate the hydraulic command slightly to relieve the pins from the holes and to facilitate their removal. Fasten the pins (H) to the safety locks on the hole (J).



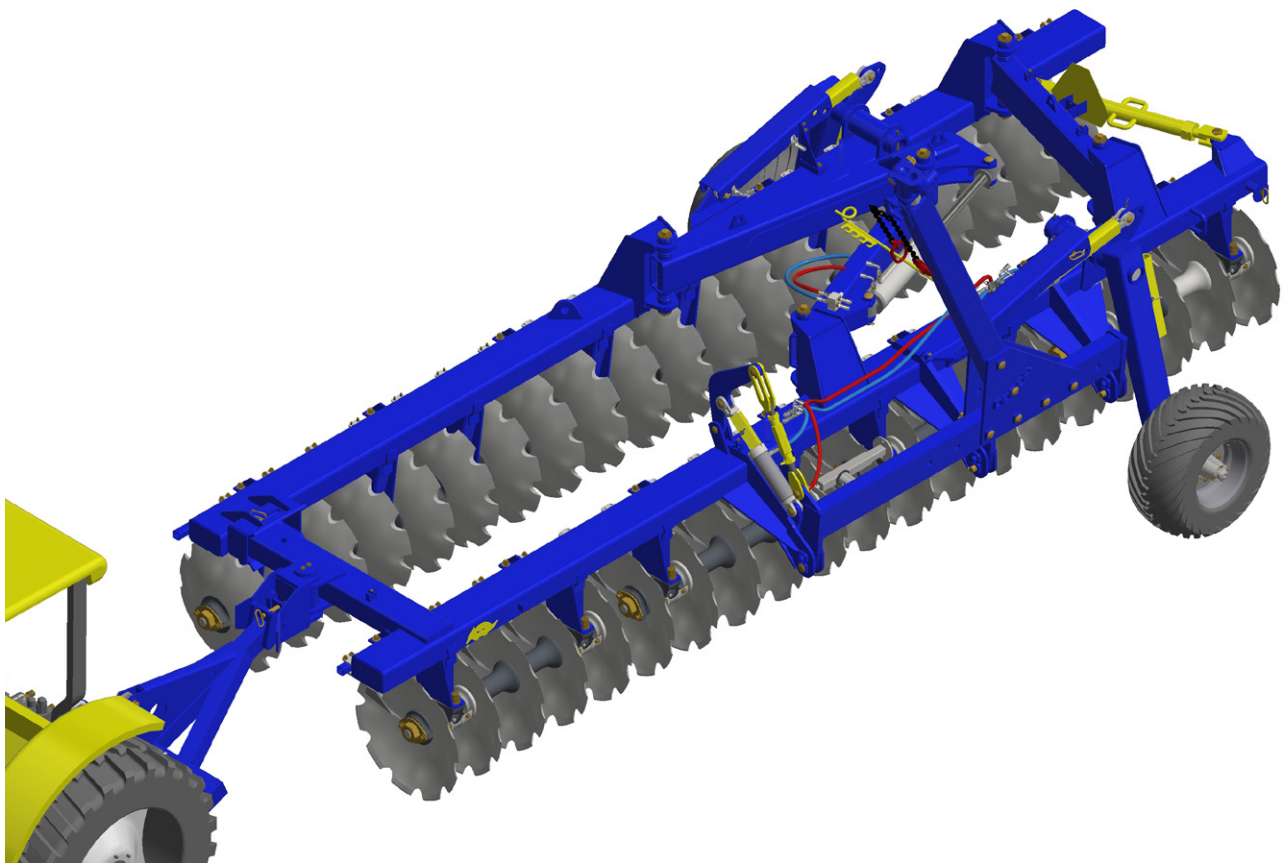
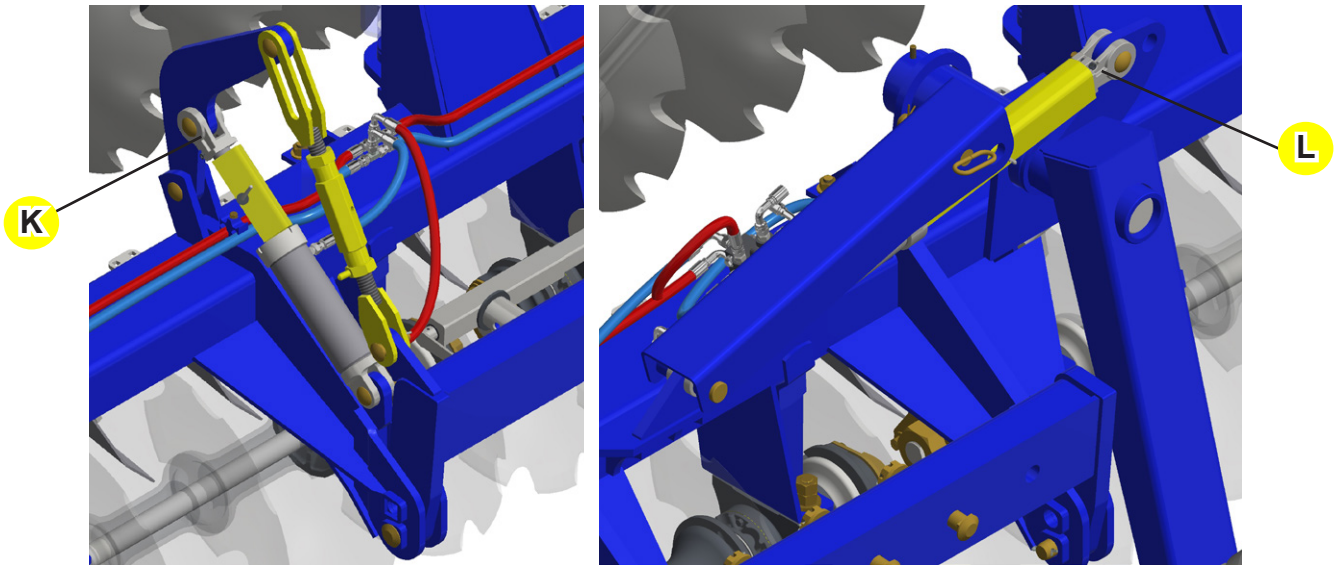
- Activate the hydraulic command to lower the tires and to lift the harrow.



- **Before activating the hydraulic command to lower or to lift the tires, always check if there are no people or animals close to the harrow, especially near the drawbar, which will be articulated before the tires.**
- **Do not allow the approximation of people or animals.**

## Set-up instructions

• Place the safety locks (K) to the drawbar cylinder and place the locks (L) to the wheelset cylinders.



**ATTENTION** Never loose or remove the hoses before relieving the control valve pressure.

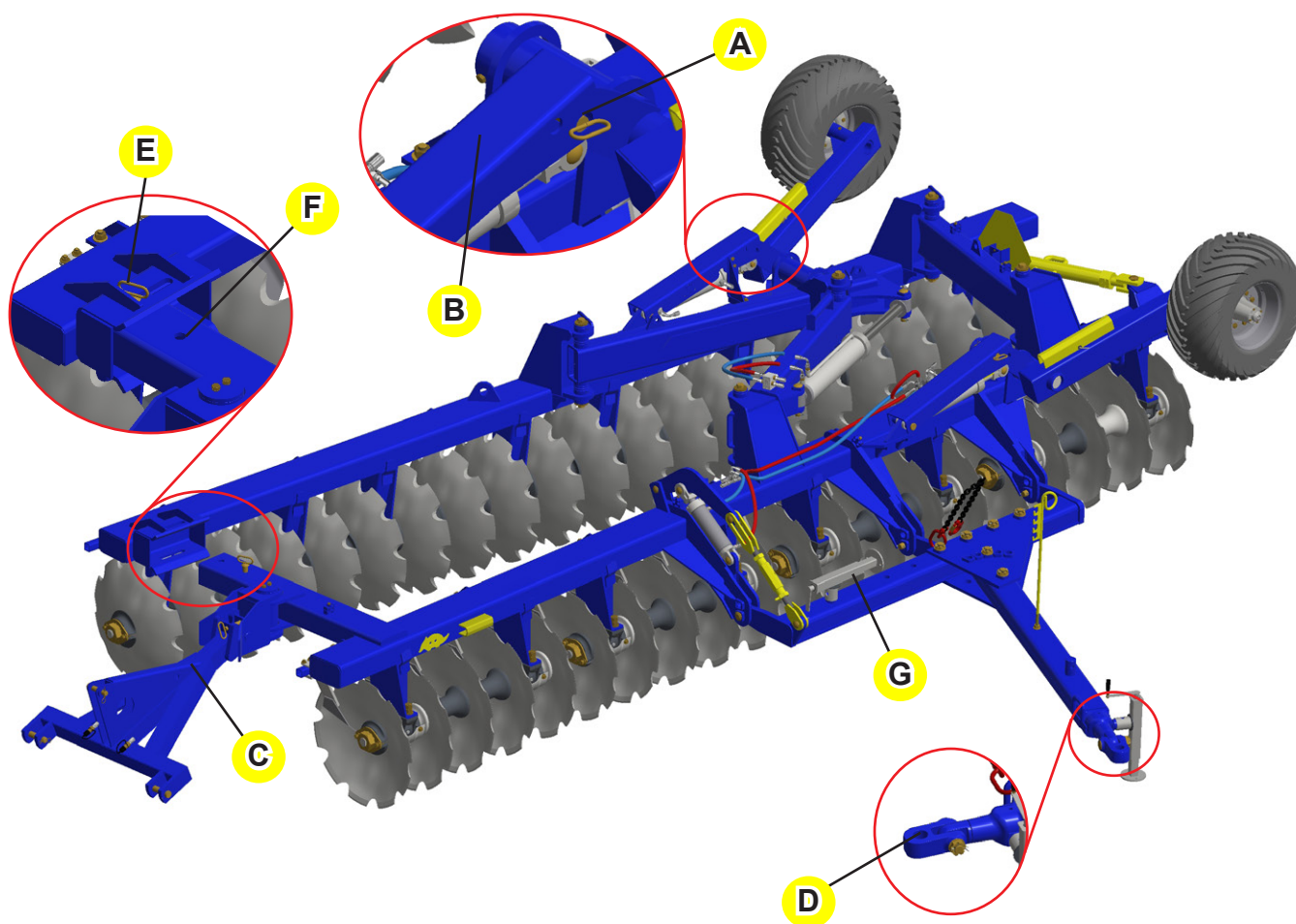
A speed of 20 km/h is safe for the transportation. Never keep the speed over 30 km/h while transporting. Maintain the harrow leveled during transportation.

# Set-up instructions

## Hitching to the tractor to operate the harrow

Being the harrow in transport position and already at the working place, proceed as follows:

- Relieve and remove the safety locks from the three cylinders (wheelsets and drawbar) and fasten them to the respective unused spots.
- Lower the harrow until the tires are totally lifted.
- Place the pins (A) to the safety locks (B) and keep the wheelsets lifted.
- Relieve the hydraulic control valve of the tractor and uncouple the hoses from the quick couplers.
- Uncouple the transport hitch (C) using a pin and cotter pin with the harrow.
- Couple the harrow hitch (D) to the tractor drawbar.
- Couple the opening cylinder hoses to the tractor quick couplers.
- Unlock the frame by removing the pin (E) and placing the pin on the hole (F).
- Position the parking stand (G) on the unused spot.



### ATTENTION

To operate on normal soils, the tractor drawbar must be fixed on the central position.

The tractor drawbar can oscillate when working on hard soils.

# Adjustments and operations

The GAPCW-EP harrow has an "OFFSET" profile and are well adjusted when the disc blades from the rear gang pass over the center of the spacing from the disc blades on the front gang and when their rotation are equivalent, that is, when they have the same number of rotations in a determined space.

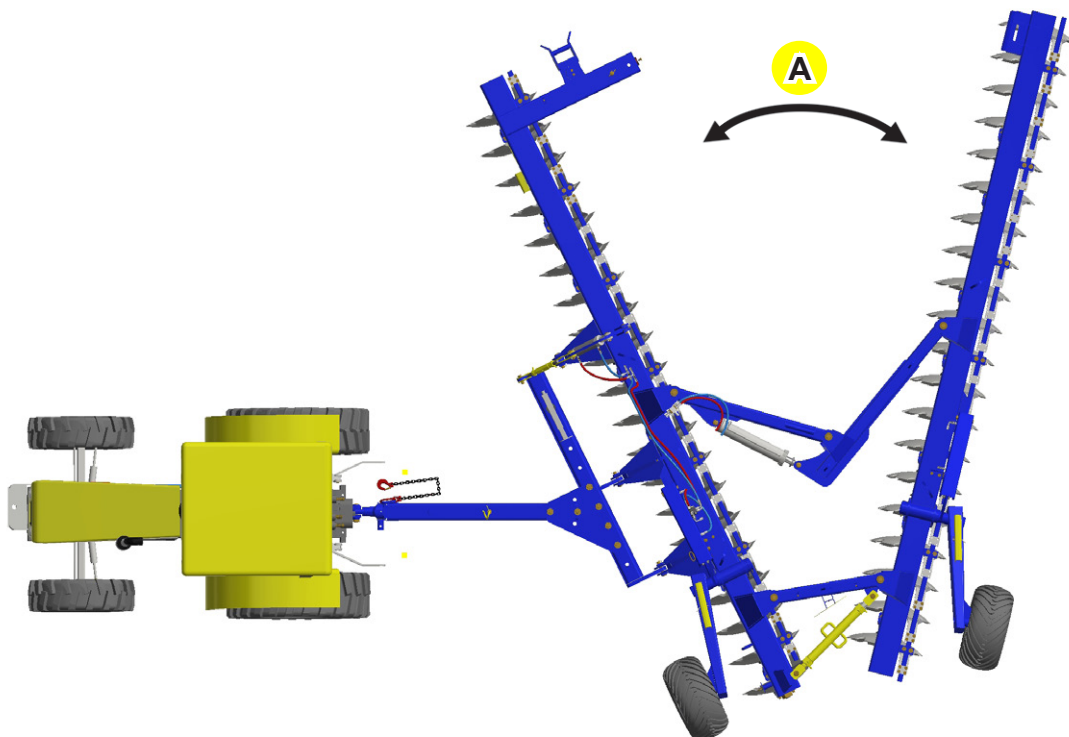
## Cutting depth

The cutting depth is adjusted by the following points:

### 1) Disc gang opening

A greater opening (A) between the disc gangs is adequate when working in harder soils, which the disc blades will have more difficult to penetrate. Reduce the opening when working on light and loose soils.

Note that the harrow opening may change the cutting angle of the rear gang disc blades.

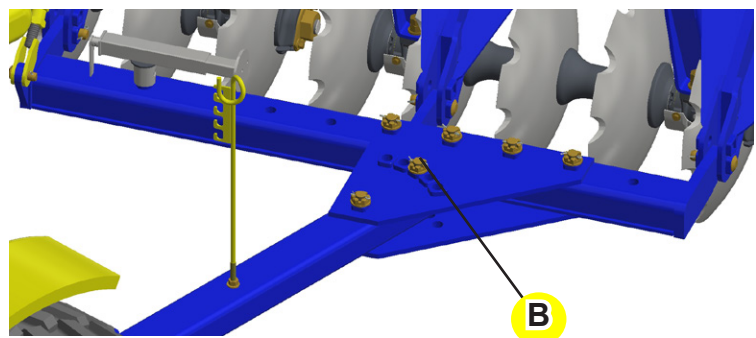


**NOTE** Use the rod stops to determine a smaller opening of the harrow, but keeping the same disc blades depth adjustment.

### 2) Drawbar angle

The holes (B) in the upper and lower plates determine a greater or smaller cutting width and also performs a small lateral displacement of the harrow.

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



# Adjustments and operations

## IMPORTANT

- To start the harrowing, we recommend using an average opening in the disc gangs and in the holes of the drawbar plates. Adjust it, if necessary.
- The harrowed soil is always on the left hand side of the operator (harrow closed side).
- Try to make a good finish between passes. Avoid the formation of furrows or untilled strips.
- The tractor and harrow drawbar should be as aligned as possible related to the work direction.

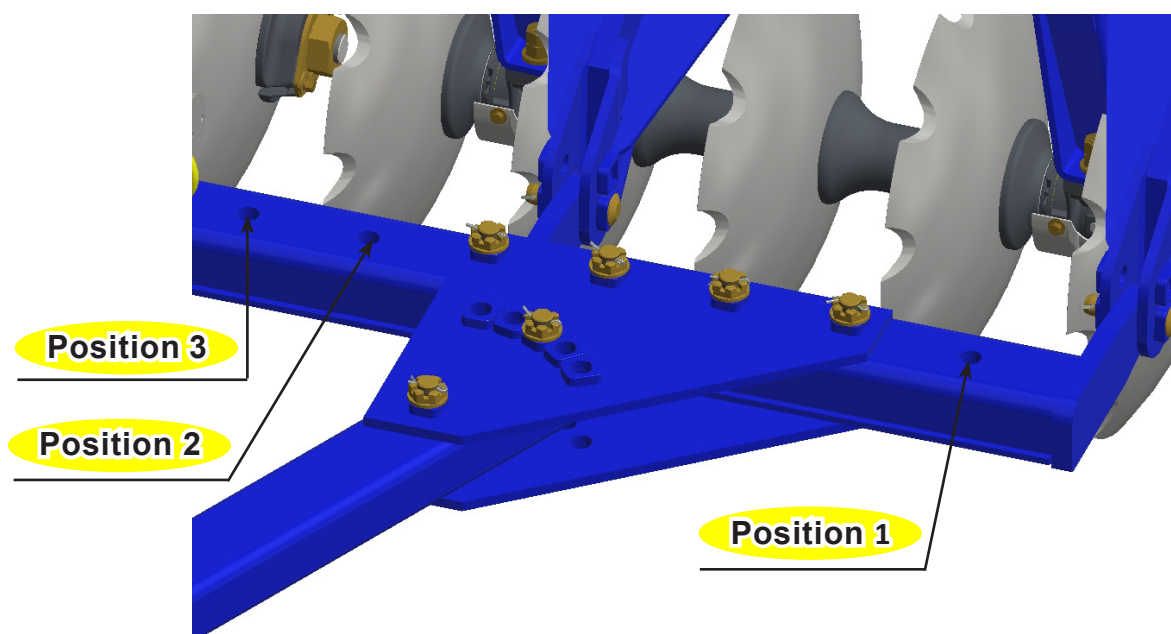
## Tractor position related to the previous pass - Lateral displacement

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 (as shown above): Used on most situations.

Position 1: Allows the tractor to get closer to the previous furrow.

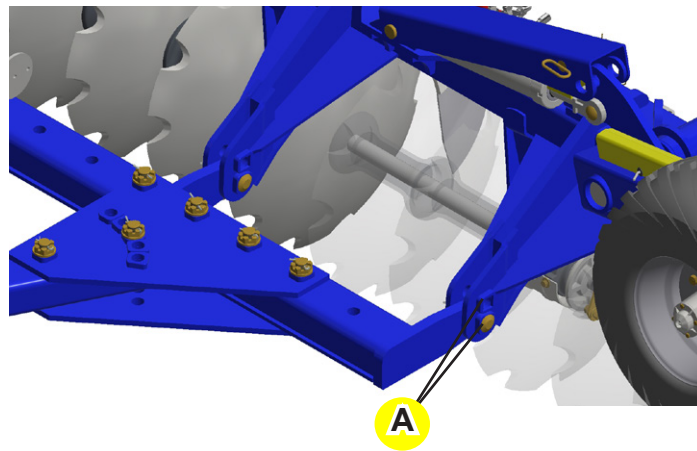
Position 2 and 3: Allows the tractor to move away from the previous furrow.



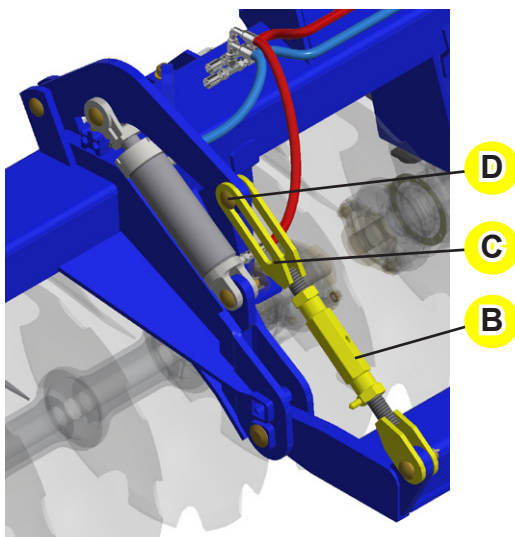
# Adjustments and operations

## Fixation holes on the hitch bar

The fixation holes on the hitch bar (A) on the front frame are used to obtain a better drawbar leveling related to the height of the tractor drawbar.



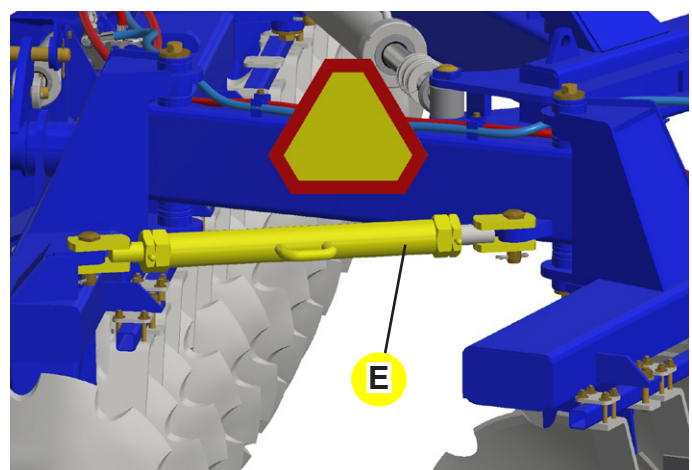
## Drawbar articulation extensor adjustment



The articulation extensor (B) adjustment is done on the field and being the disc blades with a normal working depth. On these conditions, adjust the length of the extensor in a way that the tear (C) stays centralized related to the axle (D), allowing a free articulation of the drawbar to up or down during the job.

## Junction extensor adjustment

The extensor adjustment (E) allows the displacement of the rear gang related to the front gang, providing a better finishing between the passes and avoiding the formation of undesirable windrows or furrows.

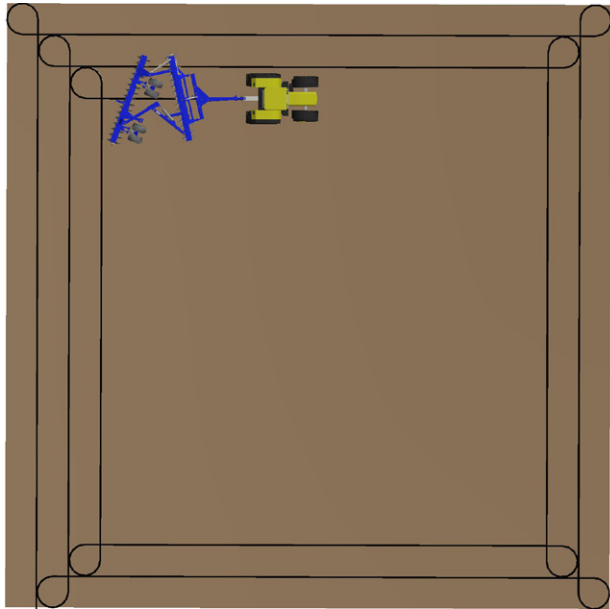


**NOTE** Check the extensor (E) assembly on page 22.

# Adjustments and operations

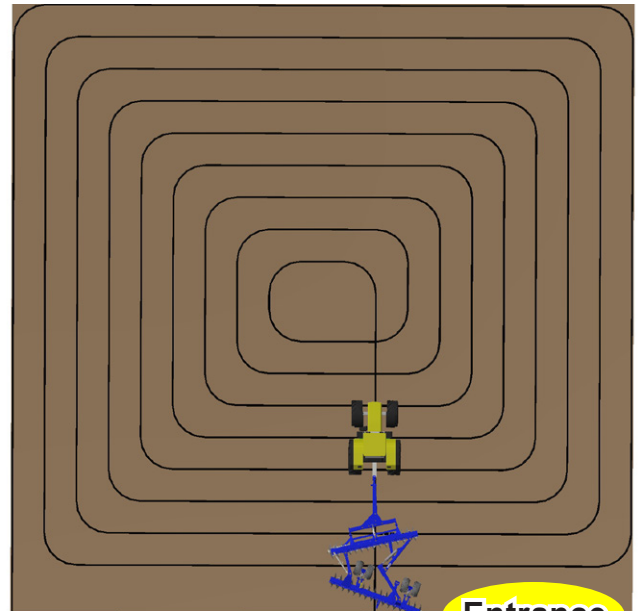
## Ways to start the harrowing

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.



Entrance

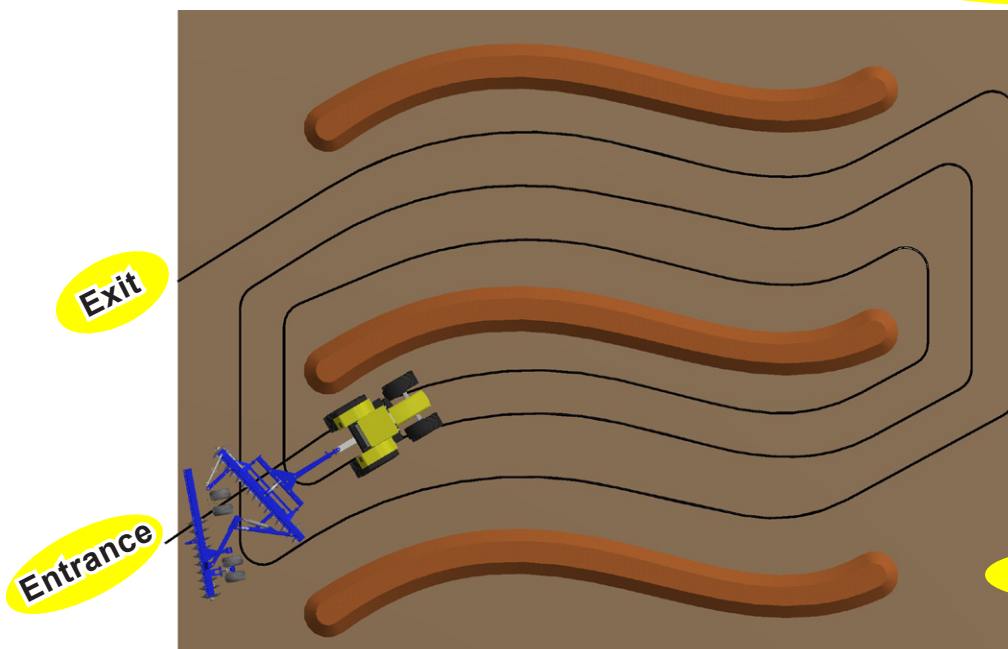
Harrowing in squares from outside to inside



Exit

Harrowing in squares from inside to outside

Entrance



Exit

Entrance

Harrowing in level

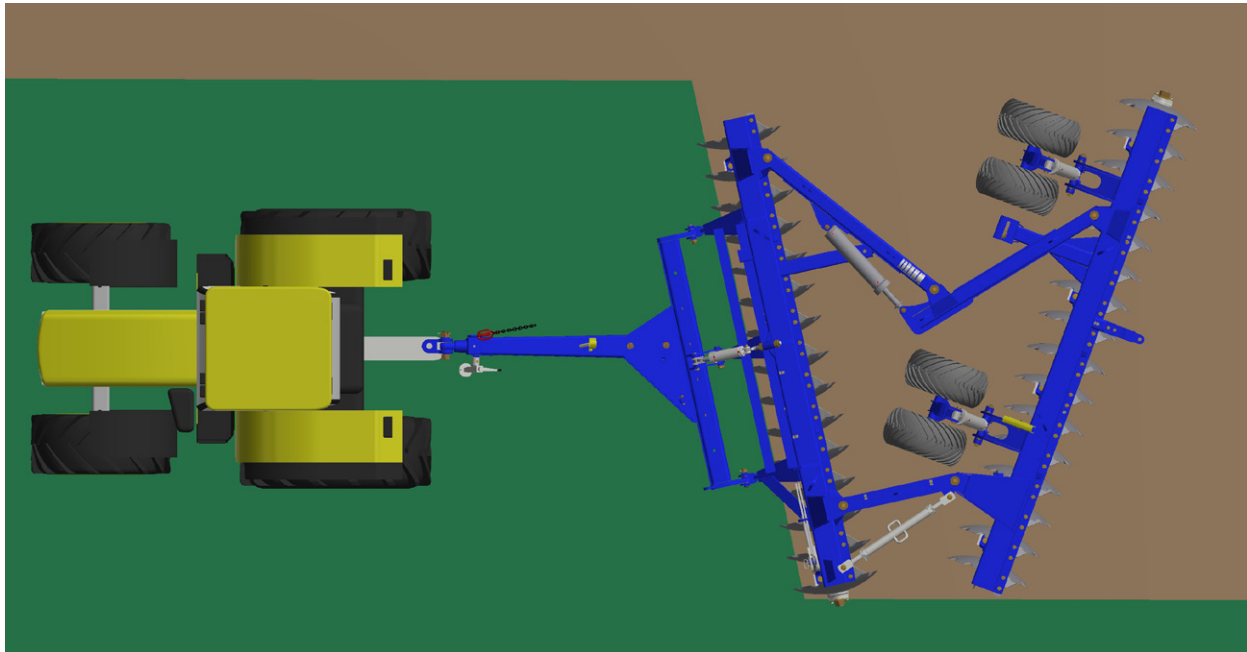
### IMPORTANT

- Note that the harrowed soil is always on the left hand side of the operator.
- Being the disc gangs lowered, only maneuver to the left. (harrow closed side).

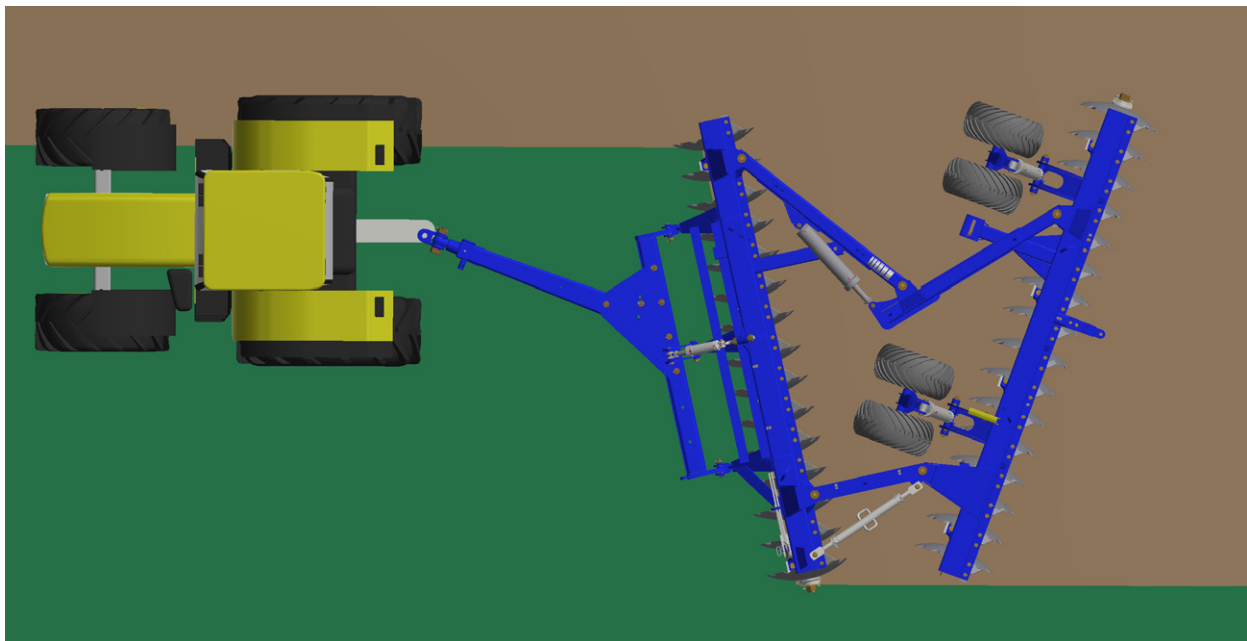
# Adjustments and operations

## Correct way for harrowing

Correct



Incorrect



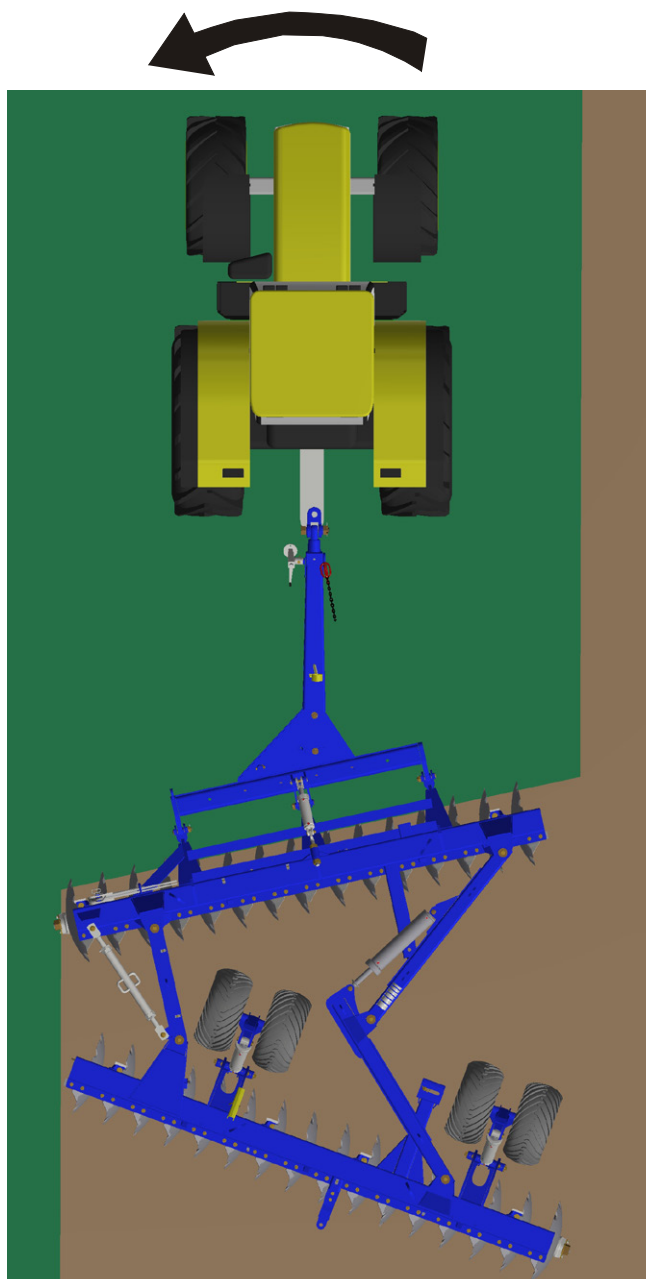
### IMPORTANT

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

# Adjustments and operations

## Direction of the maneuvers

As previously mentioned, the GAPCW-EP disk 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 to the equipment and to allow that it operates normally. Following these instructions also avoids the undesirable formation of large furrows in the maneuver spots.

# Adjustments and operations

## Troubleshooting

| 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.<br>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.                                     | Use the rod stops to decrease the depth.<br>Lift the disc blade to reduce the penetration.        |
|  | Worn out / incorrectly adjusted scrapers.                         | Adjust or change the scrapers when necessary.   |

# Adjustments and operations

## Troubleshooting

| 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.<br>Normal pressure 180 Kg/cm <sup>2</sup> |
| 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.   |

# Adjustments and operations

## 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.
- Special attention should be given to the disc gangs, retightening daily during the first week of use. Then, retighten periodically.
- Carefully observe the lubrication intervals.
- Always use a contention device to inflate the tires (tire inflation cage).
- The correct tire inflation is important; keep the pressure according to the instructions on pages 10 and 49.
- Choose a gear that allows the tractor to maintain certain power reserve, ensuring against unforeseen efforts.
- Speed is relative to the tractor gear and can only be determined by local conditions. We adopted an average 5 to 9 km/h, which is not advisable to overcome to maintain service efficiency and avoid possible damages to the equipment.
- Before maneuvering the headboards, activate the hydraulic cylinder gradually to lift the disc gangs.
- During the harrowing (being the disc blades on the soil), never maneuver to the right, because the angle formed by the disc gangs start to transmit great effort to the equipment, overloading the traction components.
- During working or transportation, do not allow passengers on the tractor or equipment.
- Remove pieces of wood or any object that may attach in the disc blades.
- When working on hard soils, which the disc blade penetration is difficult, the depth can be minimum and the operation may be unsatisfactory. On these cases, we recommend using an equipment that is more appropriate.
- Relieve the control valve pressure before relieving the quick couplers and when doing any verification in the hydraulic cylinder.
- The drawbar must remain loose during working and fixed during transportation.
- As previously mentioned, this harrow has several settings. However, only the local conditions can determine the best adjustment thereof.

# Maintenance

## 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, being the harrow in a flat place.

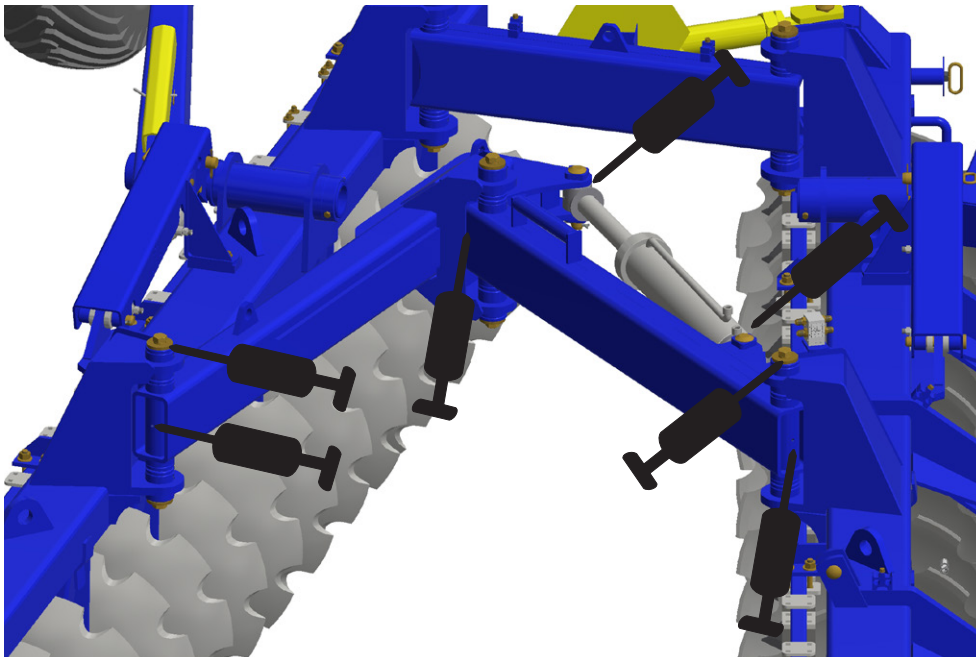
The oil volume on the DM bearings is 600 ml.



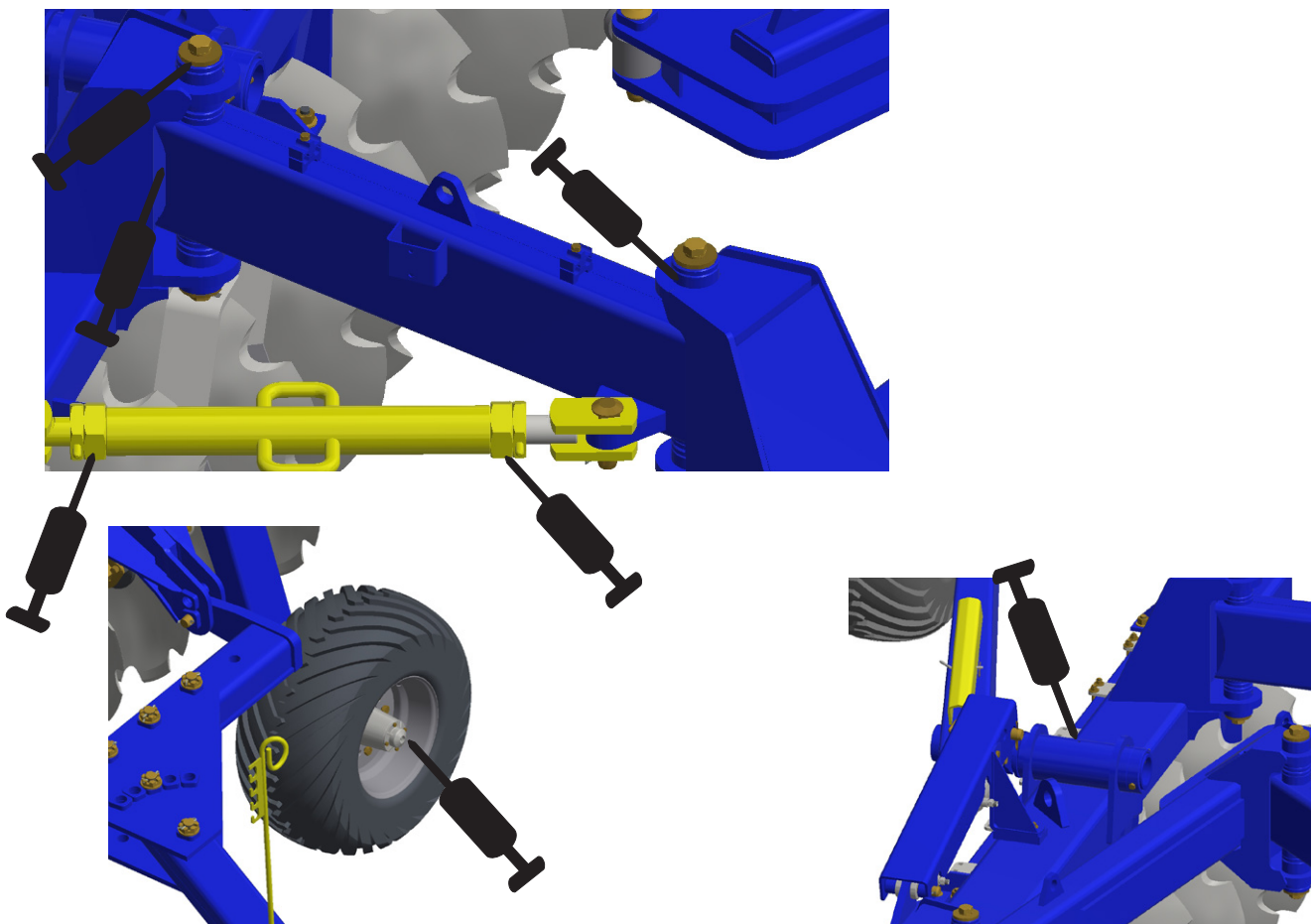
# Maintenance

## Lubrication points

Lubricate every 24 hours of service:



Lubricate every 100 hours of service:



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

# Maintenance

## Harrow maintenance

During offseason wash the harrow, repair any damaged paintwork, protect the disc blades with oil, lubricate all grease fittings and store the 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 the reduction in its diameter, loss of cut and other damages that may occur during the job.

After some hours of operation, the bolts on the 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 occurrence on all moving parts. Replace any part, if necessary.

Replace the missing or damaged safety stickers. Marchesan supplies these stickers, upon request and indication of their respective serial numbers. The operator must know the need and importance to keep the stickers 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, place the locks on the cylinders, lower the harrow until it touches the locks and place the parking stand with pin and cotter pin.**
- **If it is necessary to totally lower the equipment, do not place the locks or the parking stand pin, as such procedure may cause damages to the parking stand.**

# Maintenance

## Tires inflation

The tires must always be properly inflated to avoid premature wear for excess or lack of pressure and to assure precision on the distribution.

400/60-15,5-T404-14L Treleborg tire **(50 PSI)**.



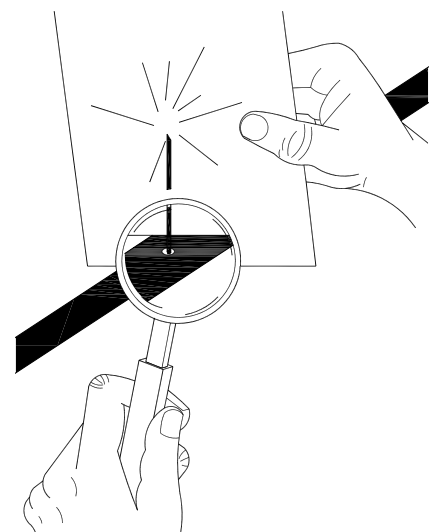
## Maintenance precautions



Caution! Hydraulic oil leakage may be strong enough to penetrate the skin and cause serious injuries to health. Oil leakage through a tiny hole may seem invisible. Use a piece of wood instead of your hand to check a possible leakage.

Keep unprotected parts of the body, such as your face, eyes and arms as far as possible from a suspected leak. A splash of hydraulic oil can even cause gangrene or other maladies.

In case of such kind of accidents or any other, consult a doctor immediately. If such doctor does not possess proper knowledge of this kind of problem, ask for a referral or search to find the proper treatment.

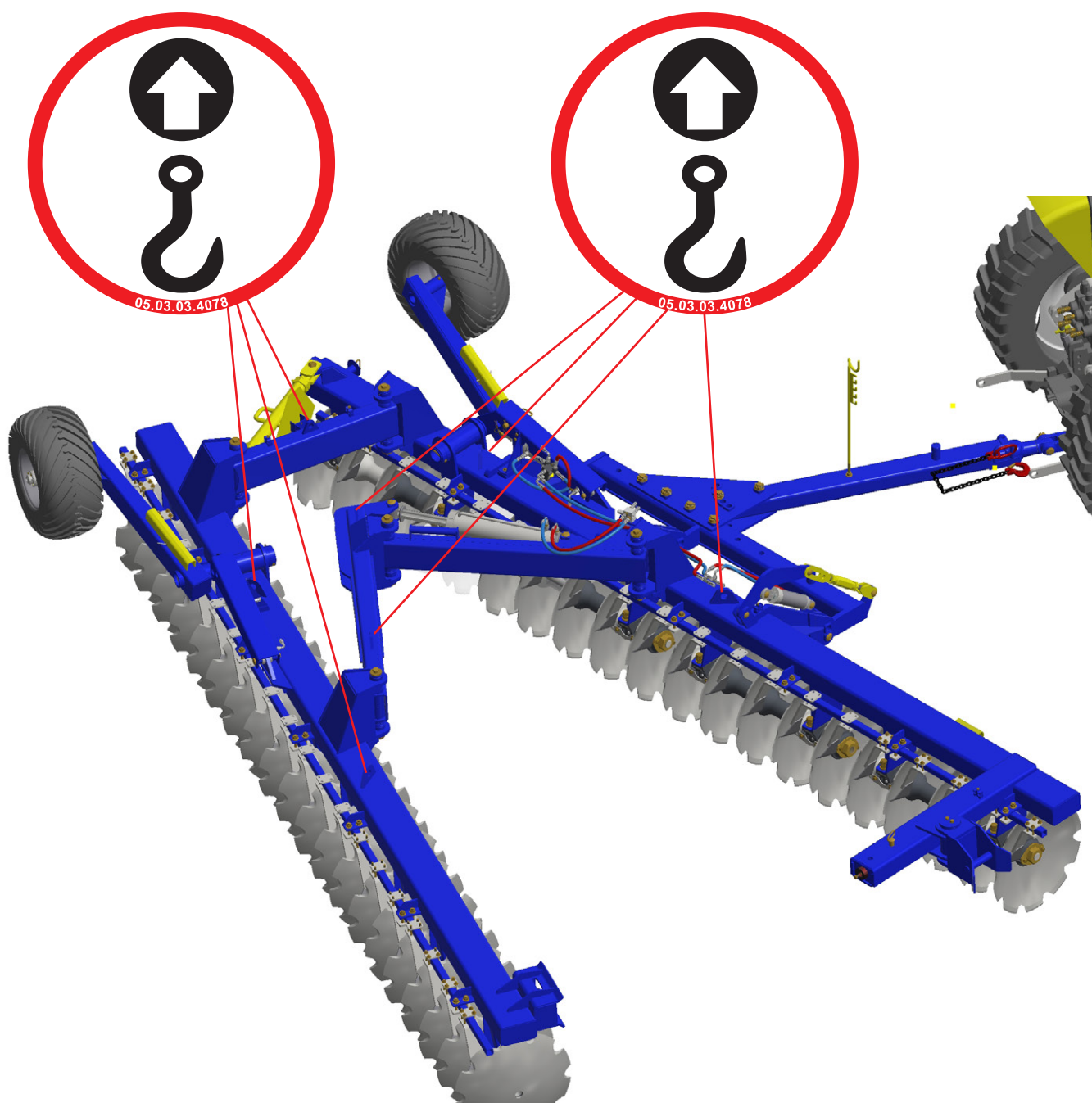


**NOTE** Use TATU original parts only.

# Maintenance

## Lifting points

This harrow has adequate lifting points, being two on the front and two on the rear. When lifting with a hoist, it is necessary to hitch on these lifting points, as shown below.



Use the suitable points for lifting and check if the equipment is safe. Avoid accidents.

# Important data

## Calculation of hourly income

To calculate the hourly income, use the following calculation:

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

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<sup>2</sup>.

Example with a GAPCW-EP (40 disc blades):

**R** = ?

**L** = 6,096 m

**V** = 6,000 m/h

**E** = 0.90

**X** = 10,000 m<sup>2</sup>

$$R = \frac{6,096 \times 6,000 \times 0.90}{10,000}$$

**R = 3.29 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.

# Important data

## Average income table

| Model      | Number of disc blades | Cutting width (mm) | Hourly income (ha) | Daily income (ha) |
|------------|-----------------------|--------------------|--------------------|-------------------|
| GAPCW - EP | 30                    | 4,877              | 2.63               | 23.67             |
|            | 32                    | 5,182              | 2.80               | 25.18             |
|            | 34                    | 5,486              | 2.96               | 26.66             |
|            | 40                    | 6,096              | 3.29               | 29.63             |

**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 100 hectares to be worked with a GAPCW-EP that has 40 disc blades. (Hourly income = 3.29 ha).

$$\text{So: } \frac{100}{3.29} = 30.40$$




Approximately will be spent 30 (thirty) hours to work in an area of 100 hectares.

# Important data

## Torque table

| 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<br>No Marks. |  | GRADE 3<br>3 Marks. |  | GRADE 8<br>6 Marks. |
|---|----------------------|---|---------------------|---|---------------------|

[G:\VAL-SON\Manuals\_Inglés\Torque]

### 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).

## 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 illustrations 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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