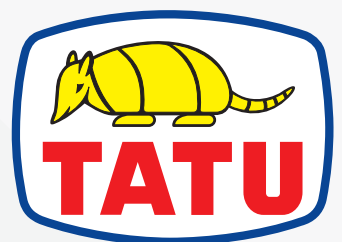


EST/MATIC 300

OPERATOR'S MANUAL



MARCHESAN

Introduction

The EST/MATIC 300 subsoiler plow was specially designed to break compacted layers deepen down to 300 mm with safety, agility and reduced maintenance.

Manufactured with 9, 11, 13, 15, 17, 19, 21 or 23 shanks, this plow features a modern structure with higher resistance. The shanks feature an automatic retrieving system through the coil springs to protect the equipment and also an oscillate scarification, which increases the compacted layer rupture between the row crops.

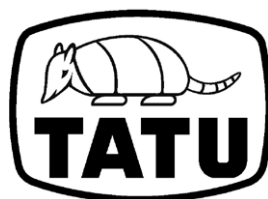
This equipment features a disc blade that is perfect to cut the straw.

It also features a cage roller to break the earth clods and to facilitate other operations, leaving a pre-leveled soil.

A seed hopper is optionally supplied for every model.

This operator's manual contains the necessary information for the best performance of this plow. 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 plows.



MARCHESAN

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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.

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

NOTE

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

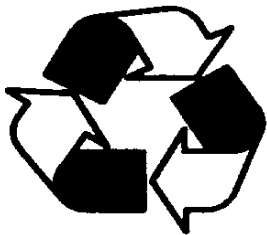
To the operator

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

This equipment 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 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.

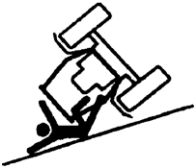
To the operator



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 overturn.



Never transport the equipment on highways or paved roads. 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.
- When setting the equipment 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 equipment 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.

To the operator

Transportation over truck or trailer



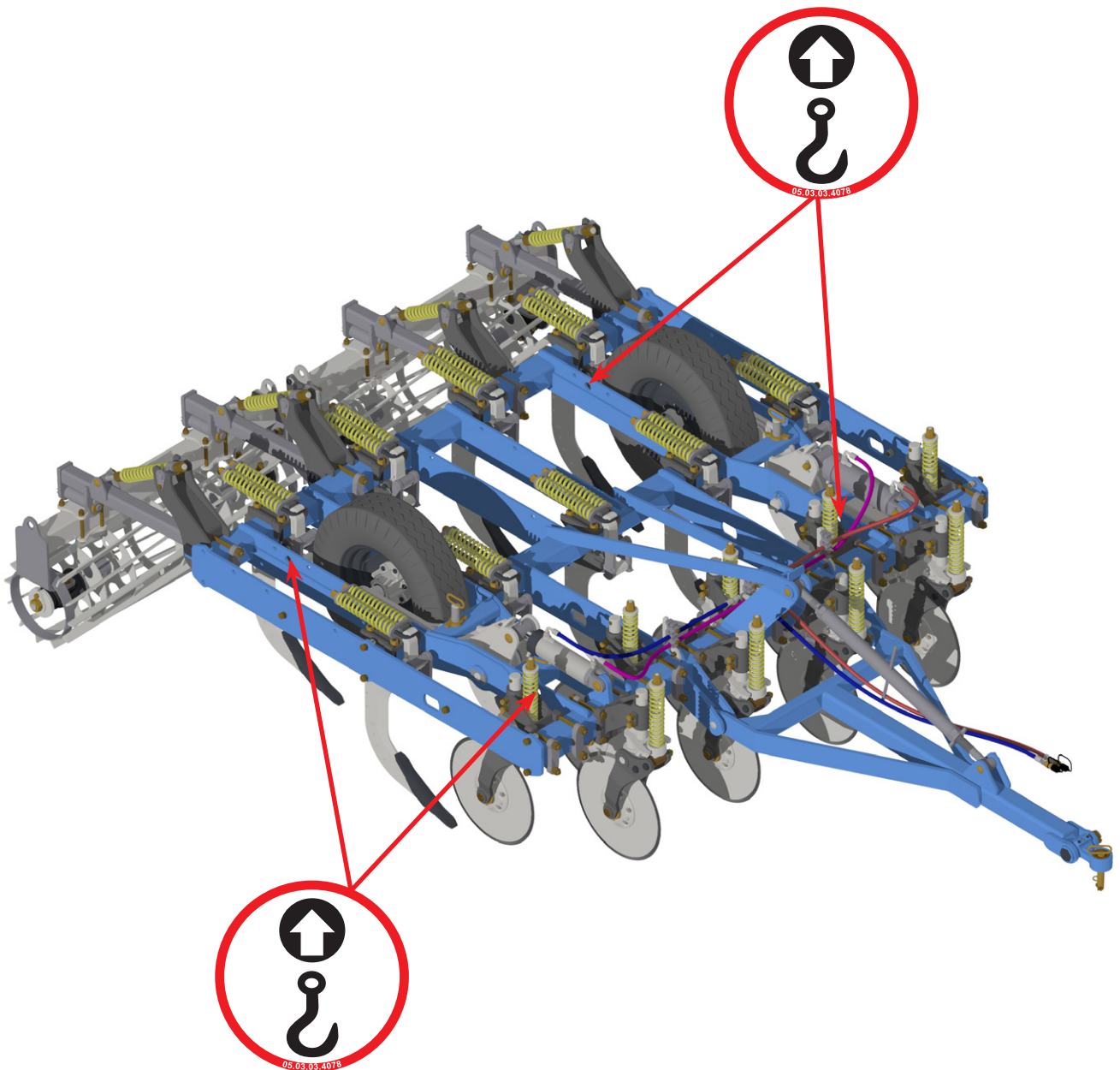
Marchesan does not advise the equipment traffic on highways, because this practice involves serious security risks in addition to being prohibited by the current existing traffic law. The transportation for long distances should be done on truck, trailer or others by following these safety guidelines:

- Use adequate ramps to load or unload the equipment. Do not make the loading on ditch banks, it can cause a serious accident.
- When lifting with a hoist, use the appropriate points for lifting.
- 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 authorities 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 on truck or trailer. If necessary use banners, lights and other devices in order to give adequate warning to the other drivers.

To the operator

Lifting points

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



- 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.

To the operator

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.

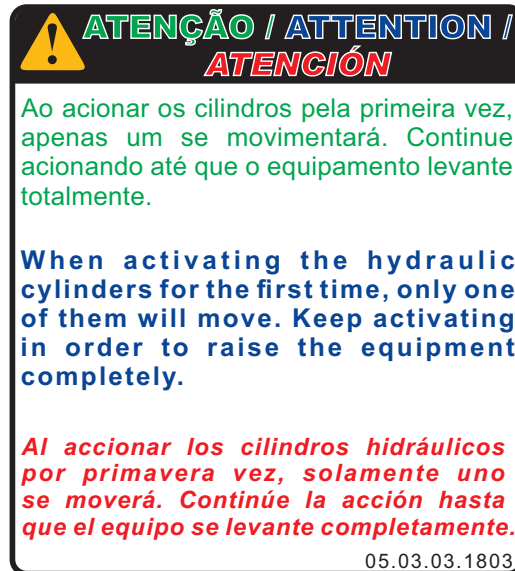


ATENÇÃO
ATTENTION
ATENCIÓN



Leia o manual antes de iniciar o uso do equipamento.
Read the manual before attempting to work with the equipment.
Lea el manual antes de iniciar el uso del equipo.

05.03.03.1428



ATENÇÃO / ATTENTION / ATENCIÓN

Ao acionar os cilindros pela primeira vez, apenas um se movimentará. Continue acionando até que o equipamento levante totalmente.

When activating the hydraulic cylinders for the first time, only one of them will move. Keep activating in order to raise the equipment completely.

Al accionar los cilindros hidráulicos por primavera vez, solamente uno se moverá. Continúe la acción hasta que el equipo se levante completamente.

05.03.03.1803



ATENÇÃO / ATTENTION / ATENCIÓN

<ul style="list-style-type: none">• Verifique o nível de óleo dos mancais semanalmente;• Observe, diariamente, se há vazamento;• Troque o óleo a cada 1000 horas de trabalho;• Use óleo mineral SAE 90;• Lubrifique os pontos de graxa periodicamente;• Reaperte os conjuntos de discos periodicamente (antes disso, deve-se soltar os parafusos de fixação dos mancais).	<ul style="list-style-type: none">• Check the bearings' oil level weekly;• Check the existence of eventual leaks daily;• Change the oil at every 1000 working hours;• Use mineral SAE 90 oil;• Lubricate the grease points periodically;• Re-tighten the disc assemblies periodically (to do that, you must loose the bearing fastening bolts first).	<ul style="list-style-type: none">• Verifique el nivel de aceite de los cojinetes semanalmente;• Observe si hay pérdidas, diariamente;• Cambie el aceite a cada 1000 horas de trabajo;• Utilice aceite mineral SAE 90;• Lubrique los puntos de grasa periódicamente;• Reajuste los conjuntos de discos periódicamente (para esto, antes, se deberá soltar los tornillos de fijación de los cojinetes).
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05.03.03.3038

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

05.03.03.1827

To the operator

Safety decals



Decals list

Quantity	Serial number	Description
01	05.03.06.2125	EST/MATIC 300 decal
01	05.03.06.2143	EST/MATIC 300 decal and hopper
01	05.03.03.1827	Lubricate and retighten daily decal
01	05.03.03.1428	Read the manual decal
01	05.03.03.1803	Important decal
01	05.03.03.1087	Final test decal
01	05.03.03.3038	Danger decal
01	05.03.03.1739	Danger 65 X 103 decal
04	05.03.03.4078	Lifting points decal

Data sheet

Data sheet

Model	EST/MATIC							
Number of shanks	09	11	13	15*	17	19	21	23
Spacing (mm)	300							
Depth (mm)	300							
Total seeds capacity (liters)	405	495	585	675	765	855	945	1035
(A) Length	5090				5710			
(B) Maximum height (With seed hopper)	2460							
(C) Maximum height (Without seed hopper)	1400							
(D) Transport width	3000	3630	4210	4820	5390	5755	6620	7230
(E) Working width (mm)	2700	3300	3900	4500	5100	5700	6300	6900
Hitching type	Drawbar							
Tires	2 7.50 x 16 -12 ply				4 7.50 x 16 -12 ply			
Tractor required power (cv)	110	130	160	180	205	230	250	275
	135	165	195	225	255	285	315	345

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

7.50 x 16 tires -12 ply (**72 PSI**).

Oil volume on the bearings: **110 ml.**

EST/MATIC 300 models with 09, 11, 13 and 15* shanks are equipped with 2 tires.

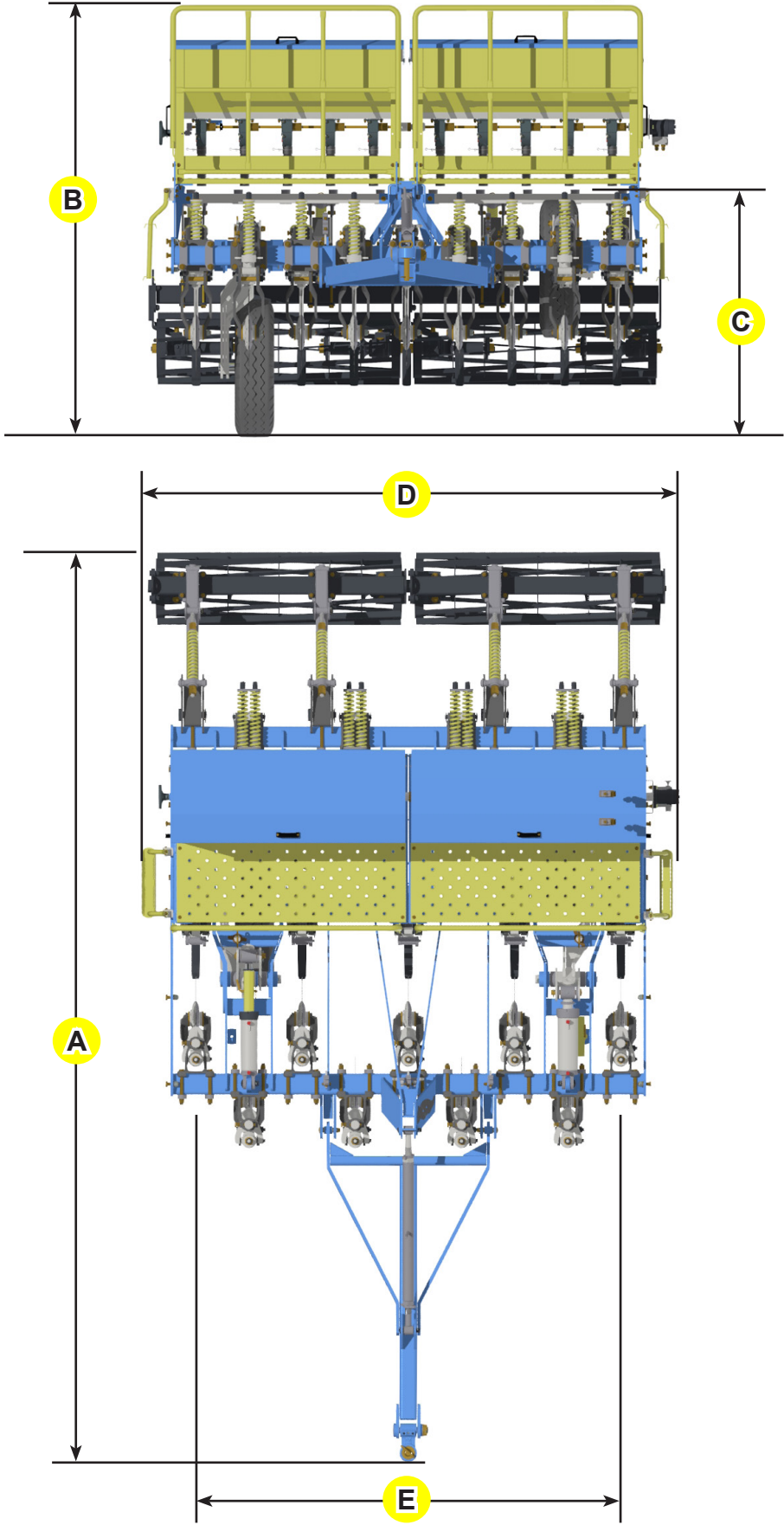
EST/MATIC 300 models with 15*, 17, 19, 21 and 23 shanks are equipped with 4 tires.

NOTE

- *Optional model with 15 shanks can be supplied with 2 or 4 tires.
- The seed hopper has a capacity of 45 liters per shank.

Data sheet

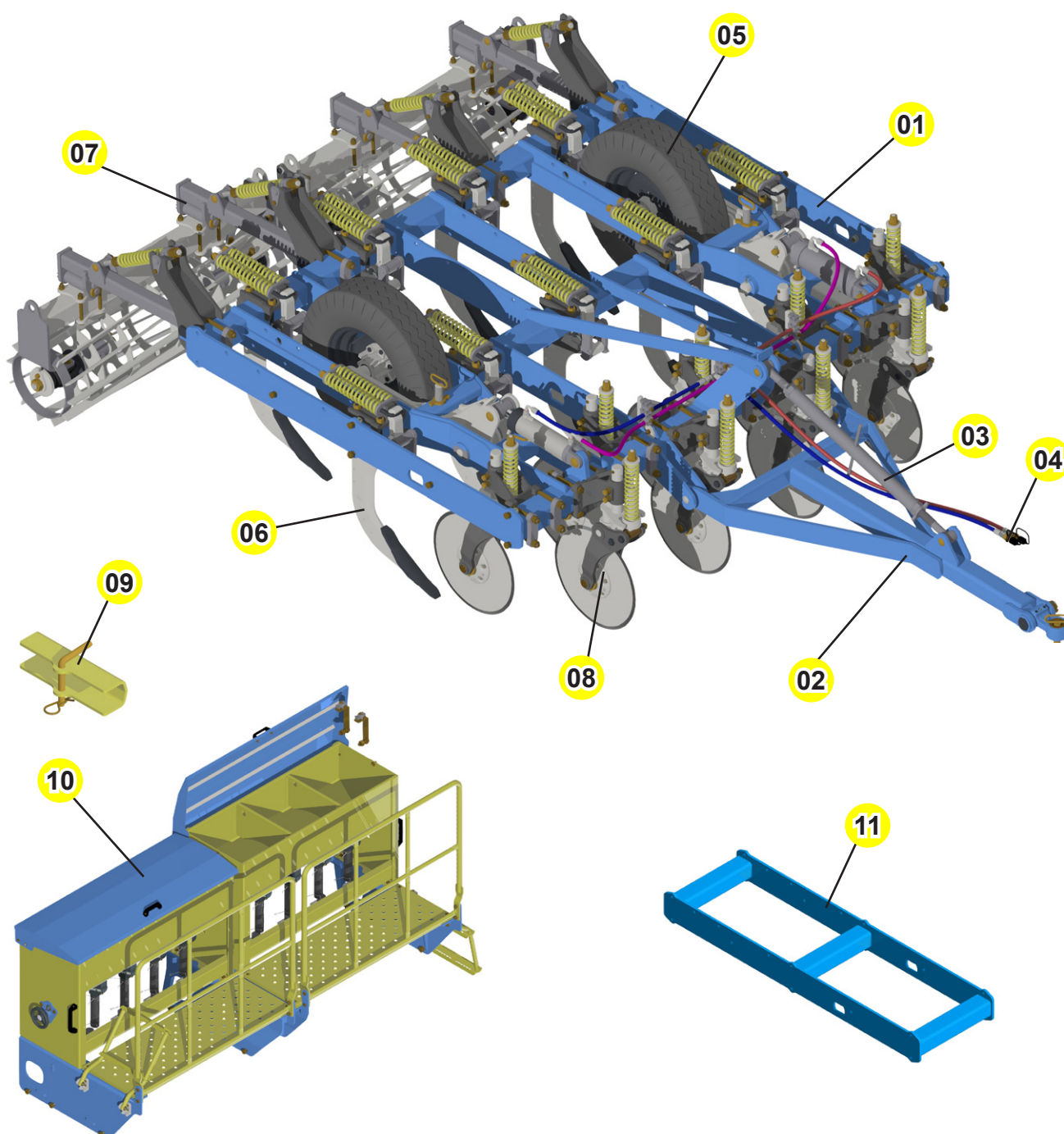
EST/MATIC dimensions (9 - 23 shanks)



Components

EST/MATIC 300

- 01 - Frame
- 02 - Drawbar
- 03 - Extensor arm
- 04 - Hydraulic circuit
- 05 - Wheelset
- 06 - Coil spring shank
- 07 - Cage roller
- 08 - Disc blade
- 09 - Transport lock
- 10 - Seed hopper (Optional)
- 11 - Lateral frame extension



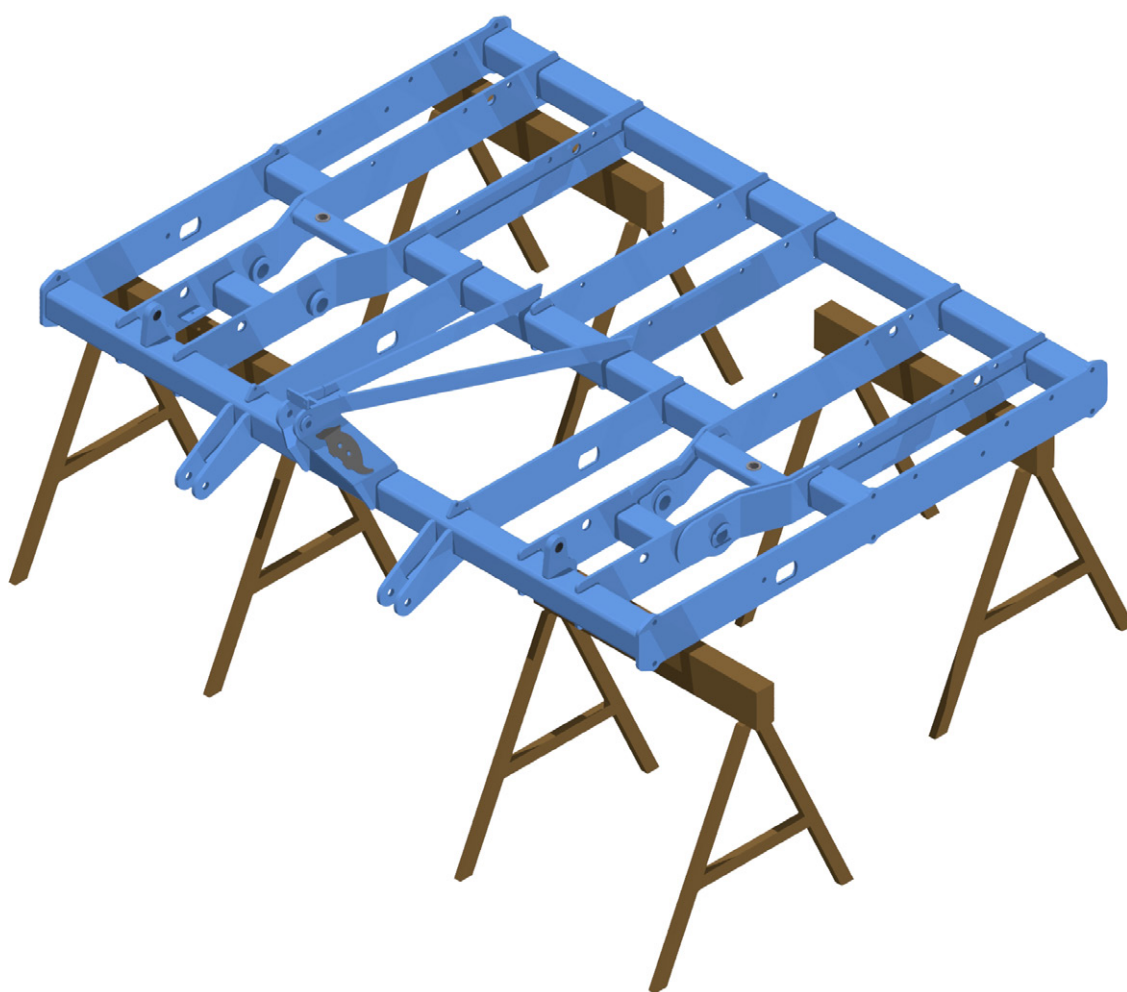
Assembly

Components assembly

To facilitate transportation, the plow leaves the factory unassembled. To start assembling, choose a flat and clean place and follow the steps below:

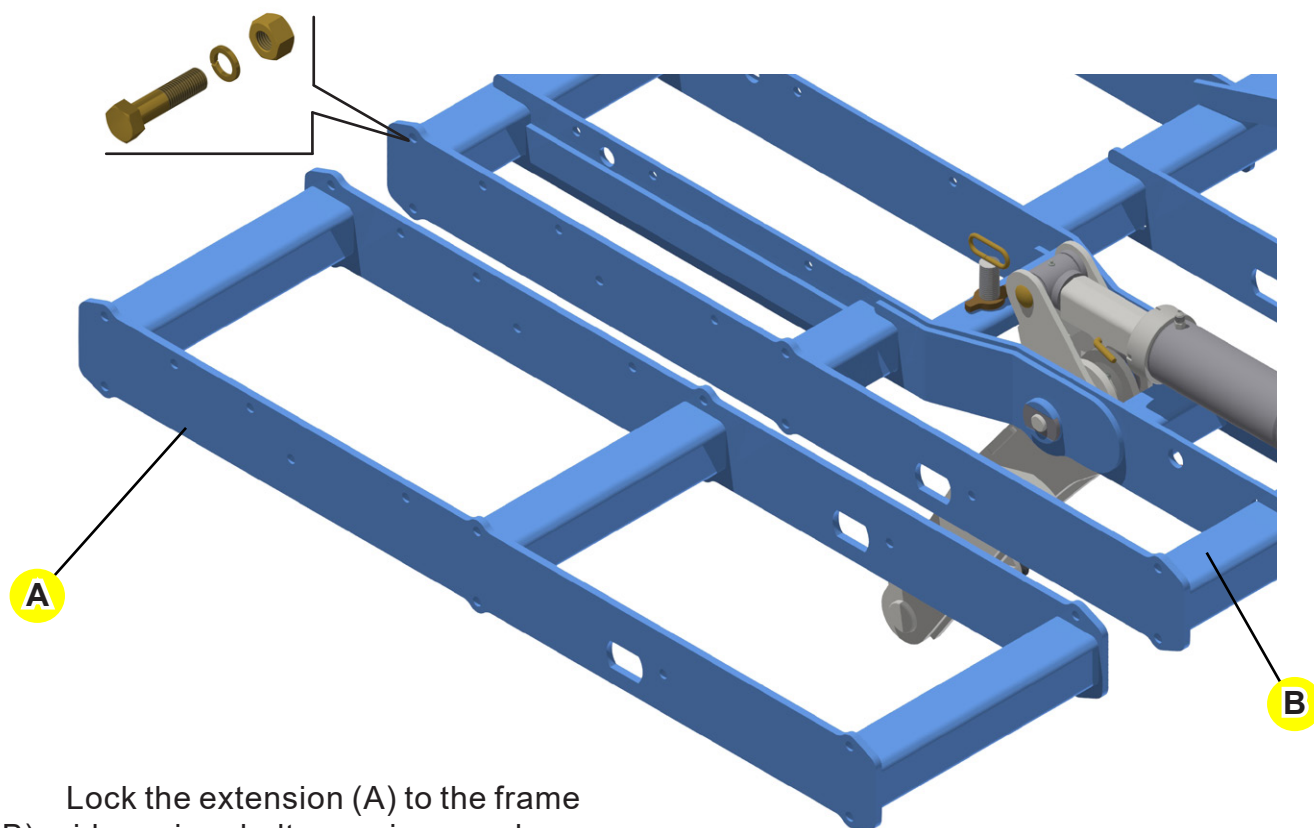
Separate the parts to facilitate identification and check them according to the list that can be found inside the box.

Place the frame over two trestles with a height of at least 850 mm each.



Assembly

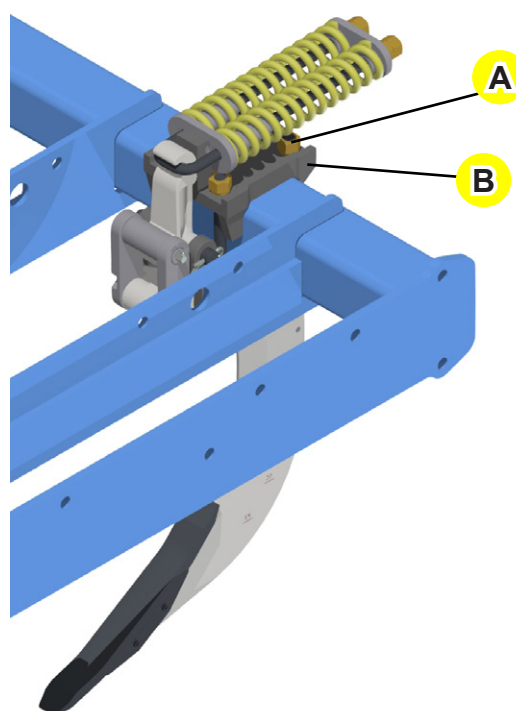
Frame extension assembly



Lock the extension (A) to the frame (B) side using bolts, spring washers and nuts.

Shanks assembly

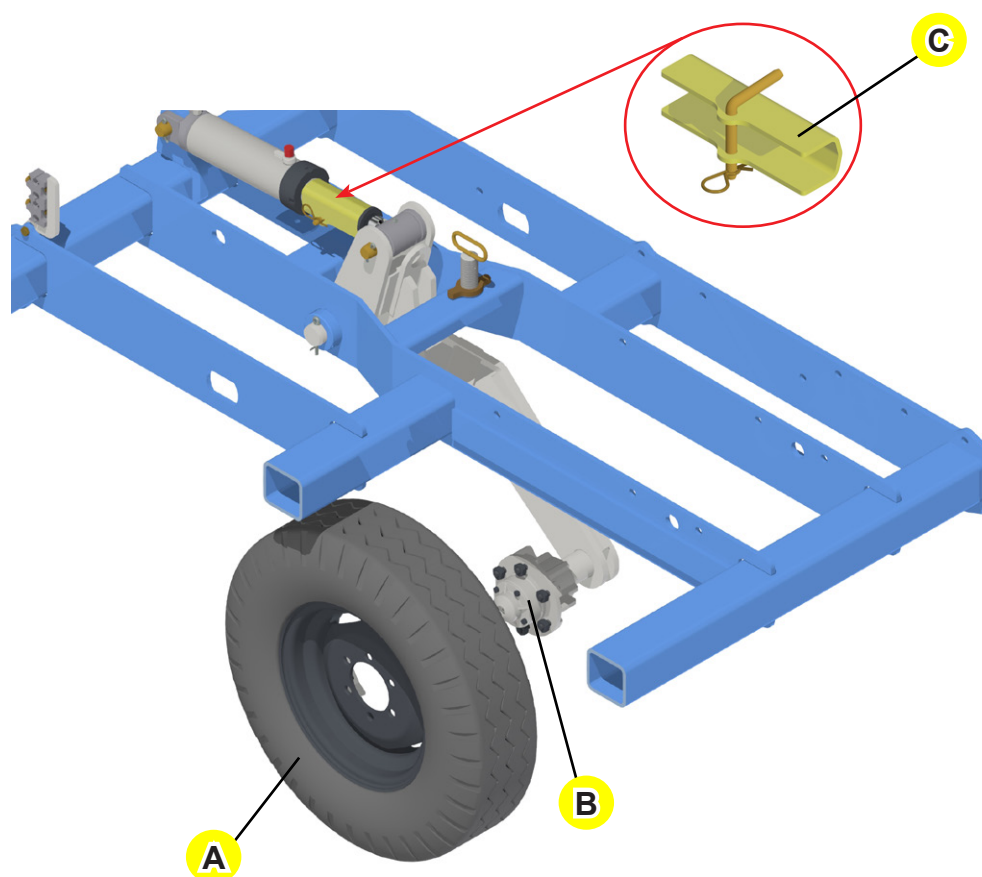
Couple the shanks to the frame using bolts (A), support plate (B), flat washers, nuts and counternuts.



Assembly

Tires assembly

Assemble the tires (A) to the hubs (B) using nuts.



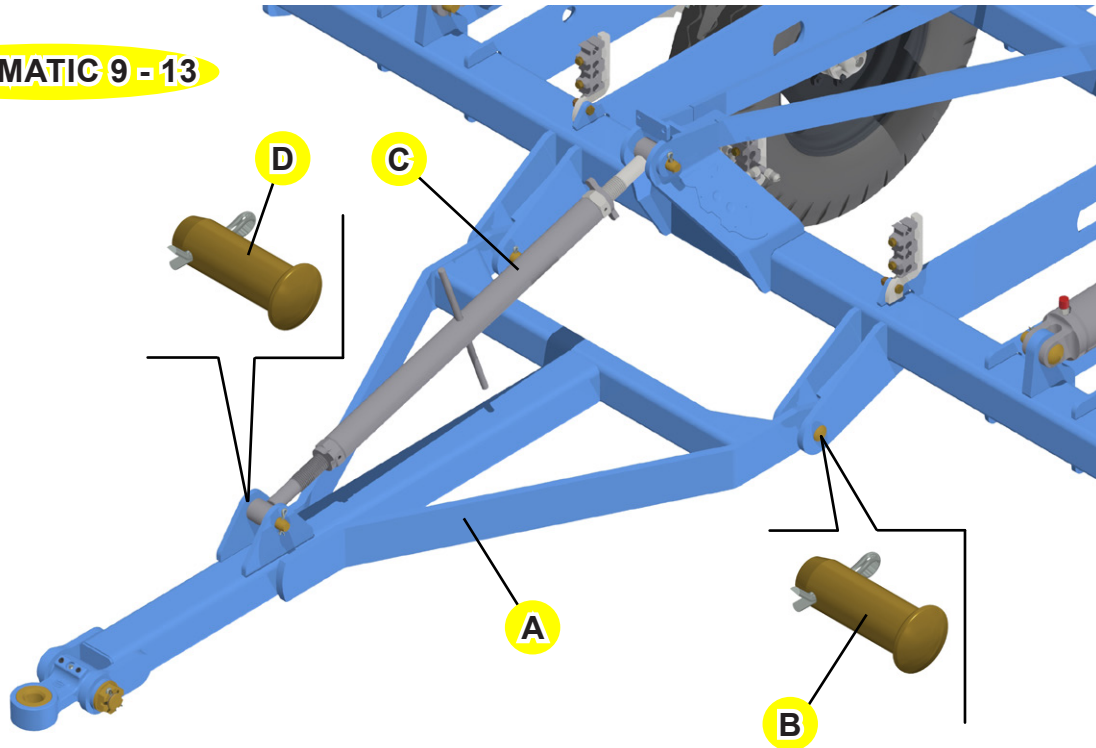
- NOTE**
- To transport the equipment, use the transport lock (C) on the cylinders.
 - To inflate the tires, check the 'tires inflation' page.

Assembly

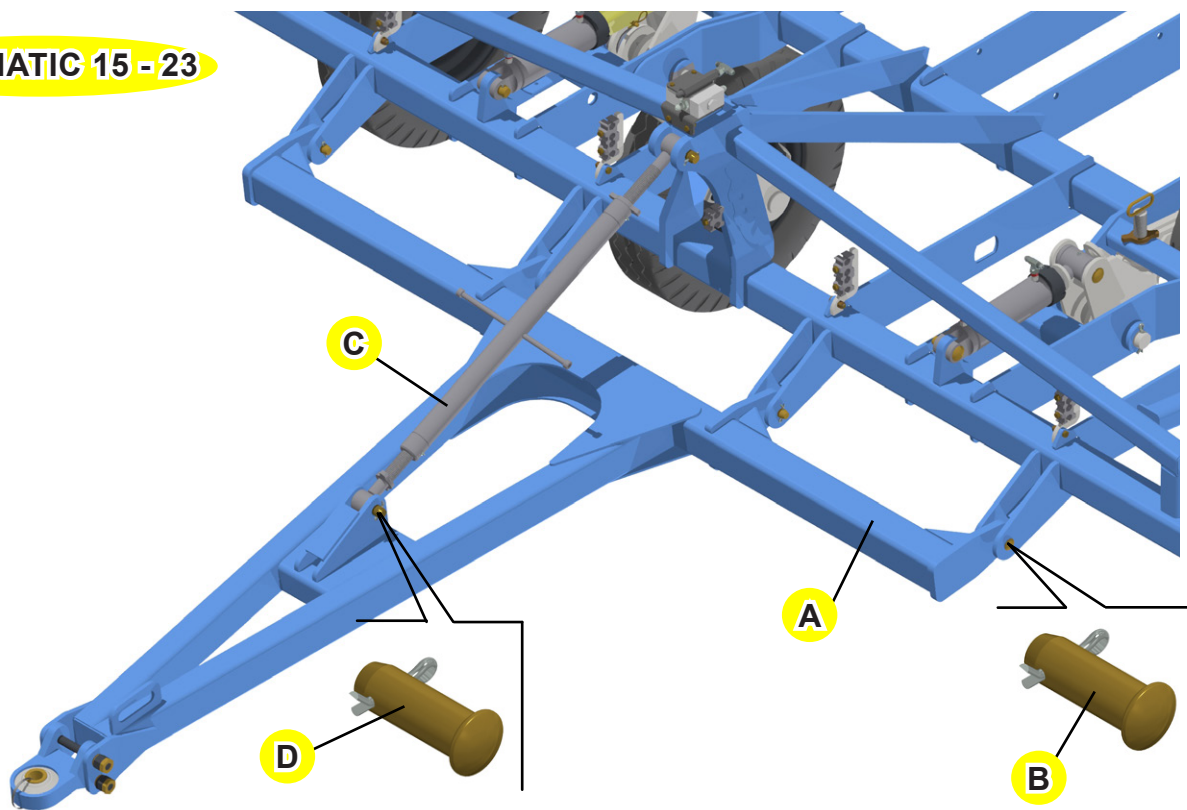
Drawbar assembly - 9 to 23 shanks

Assemble the drawbar (A) to the frame using pins (B) and cotter pin. Then, couple the extensor arm (C) to the frame bar and to the drawbar using a pin (D) and cotter pin.

EST / MATIC 9 - 13



EST / MATIC 15 - 23

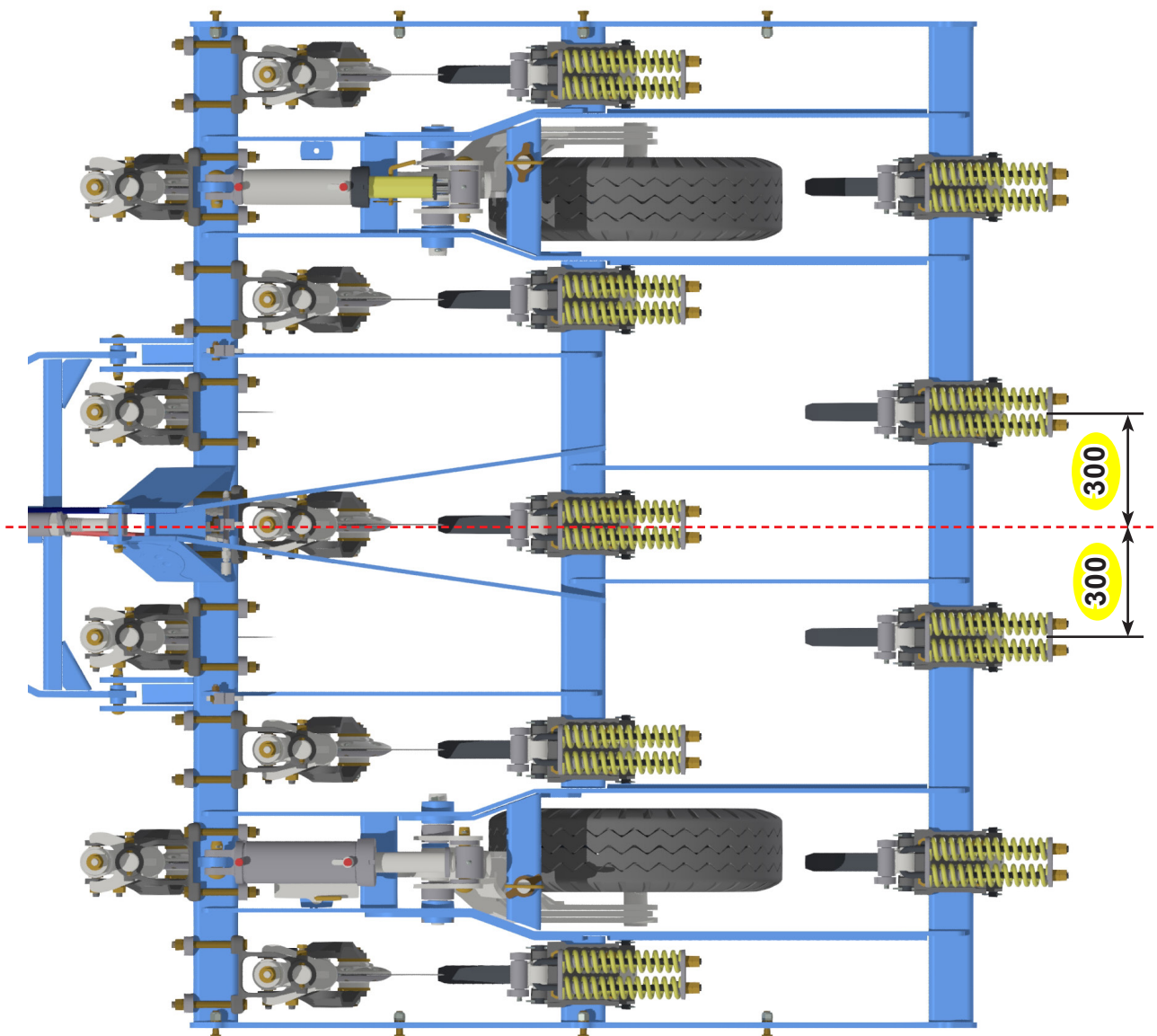


Assembly

Shanks and disc blades position

Note, in the illustrations, the correct setup of shanks and disc blades regarding the frame size, starting from the central part.

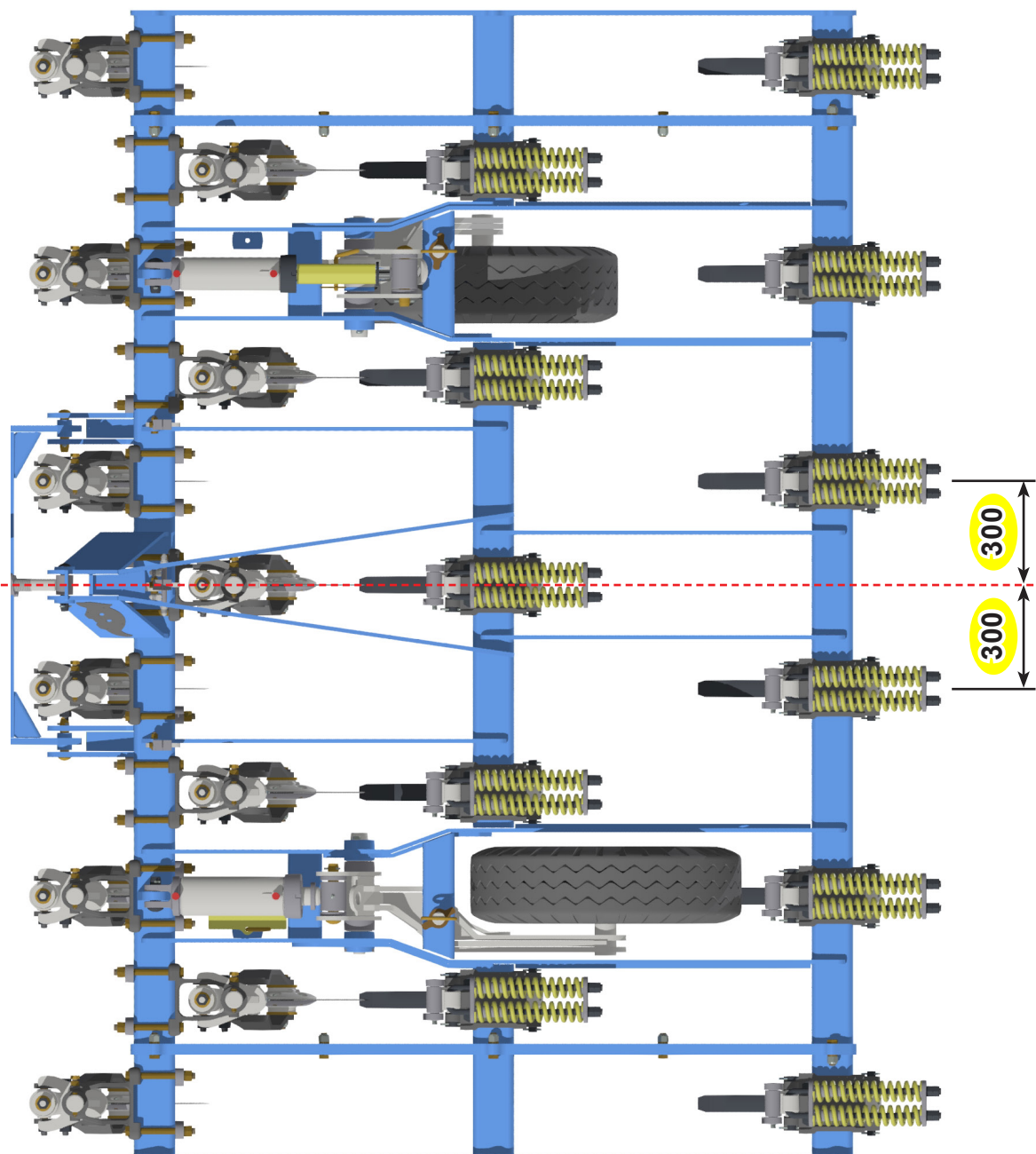
EST/MATIC 300
9 shanks



Assembly

Shanks and disc blades position

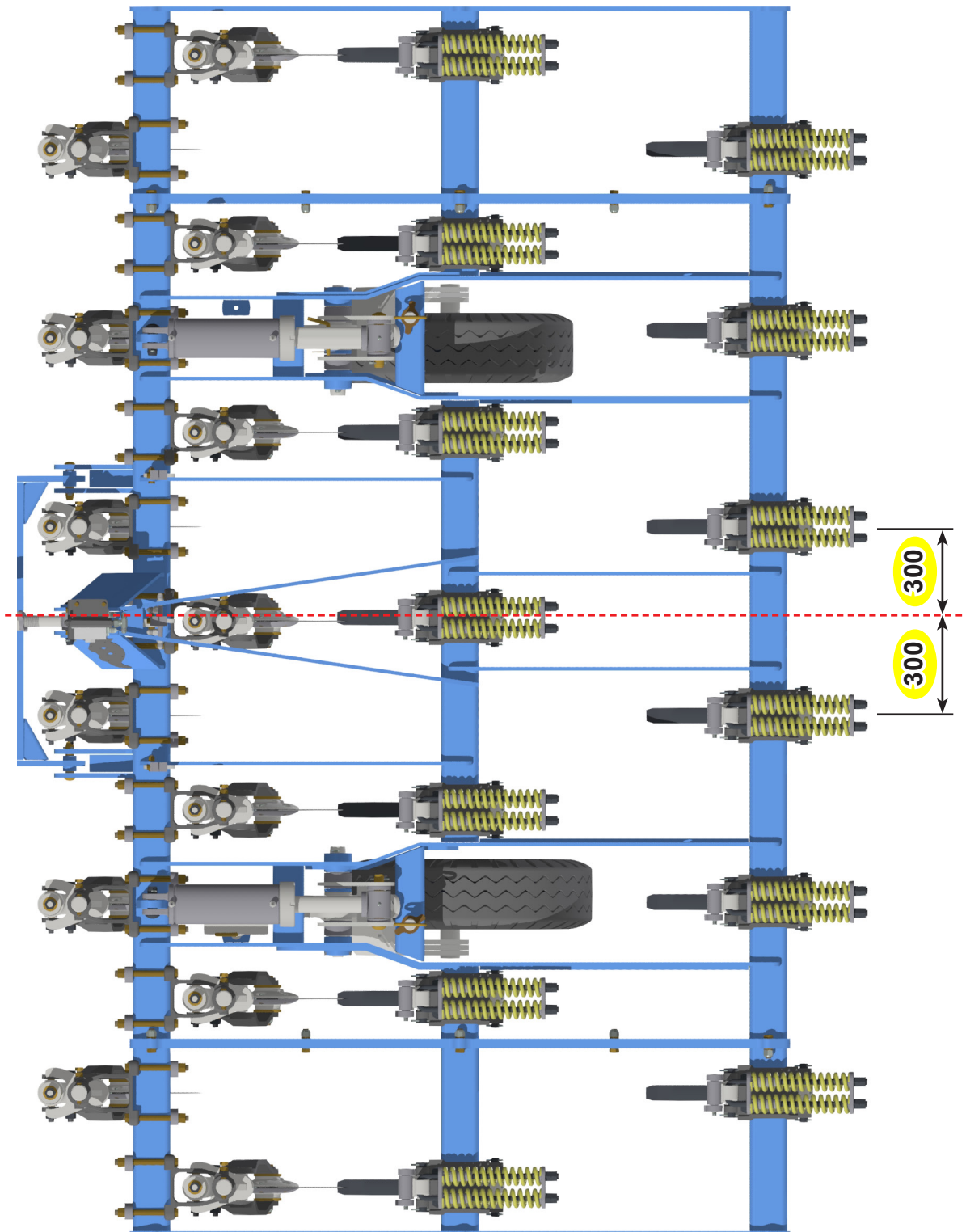
EST/MATIC 300
11 shanks



Assembly

Shanks and disc blades position

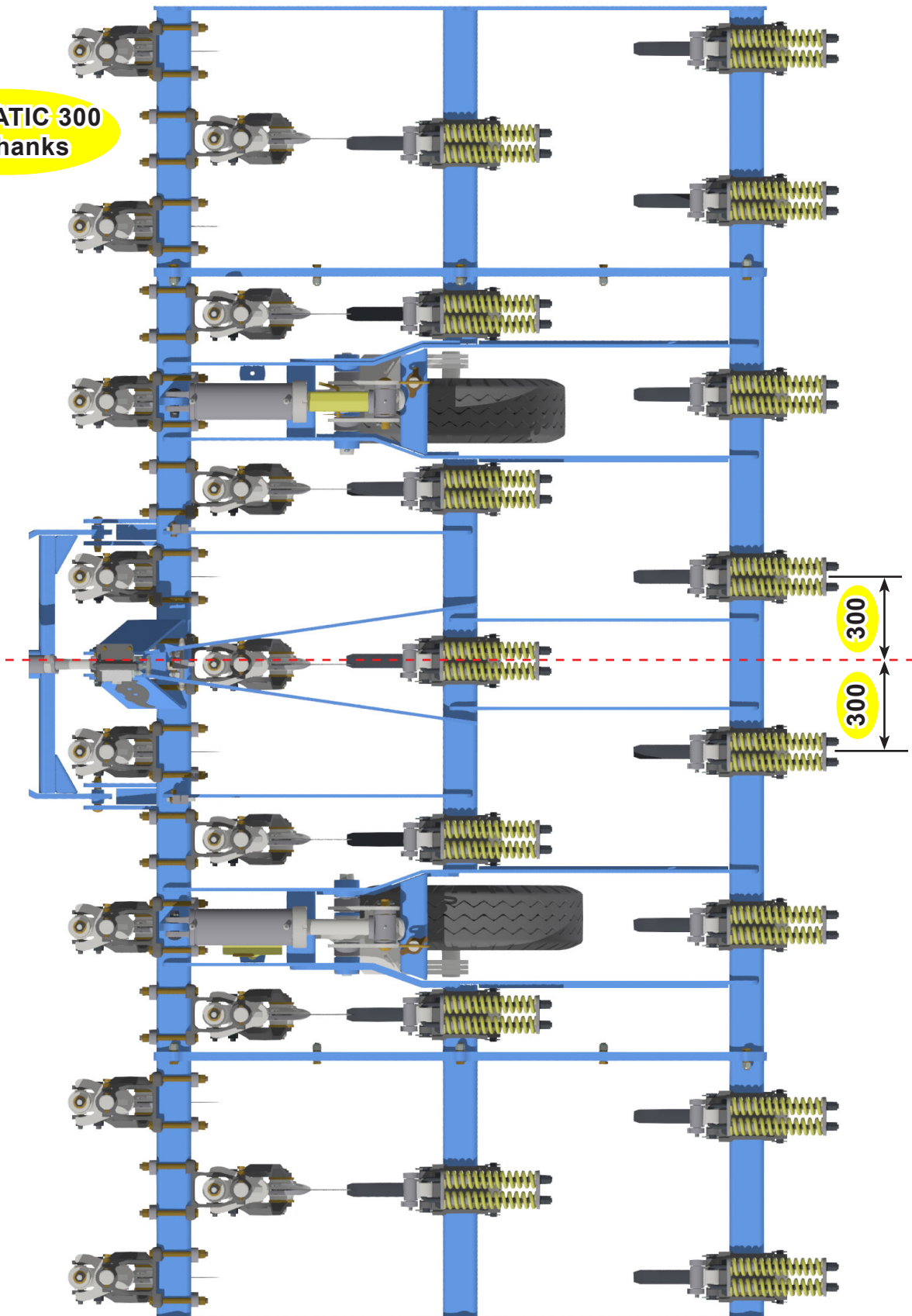
EST/MATIC 300
13 shanks



Assembly

Shanks and disc blades position

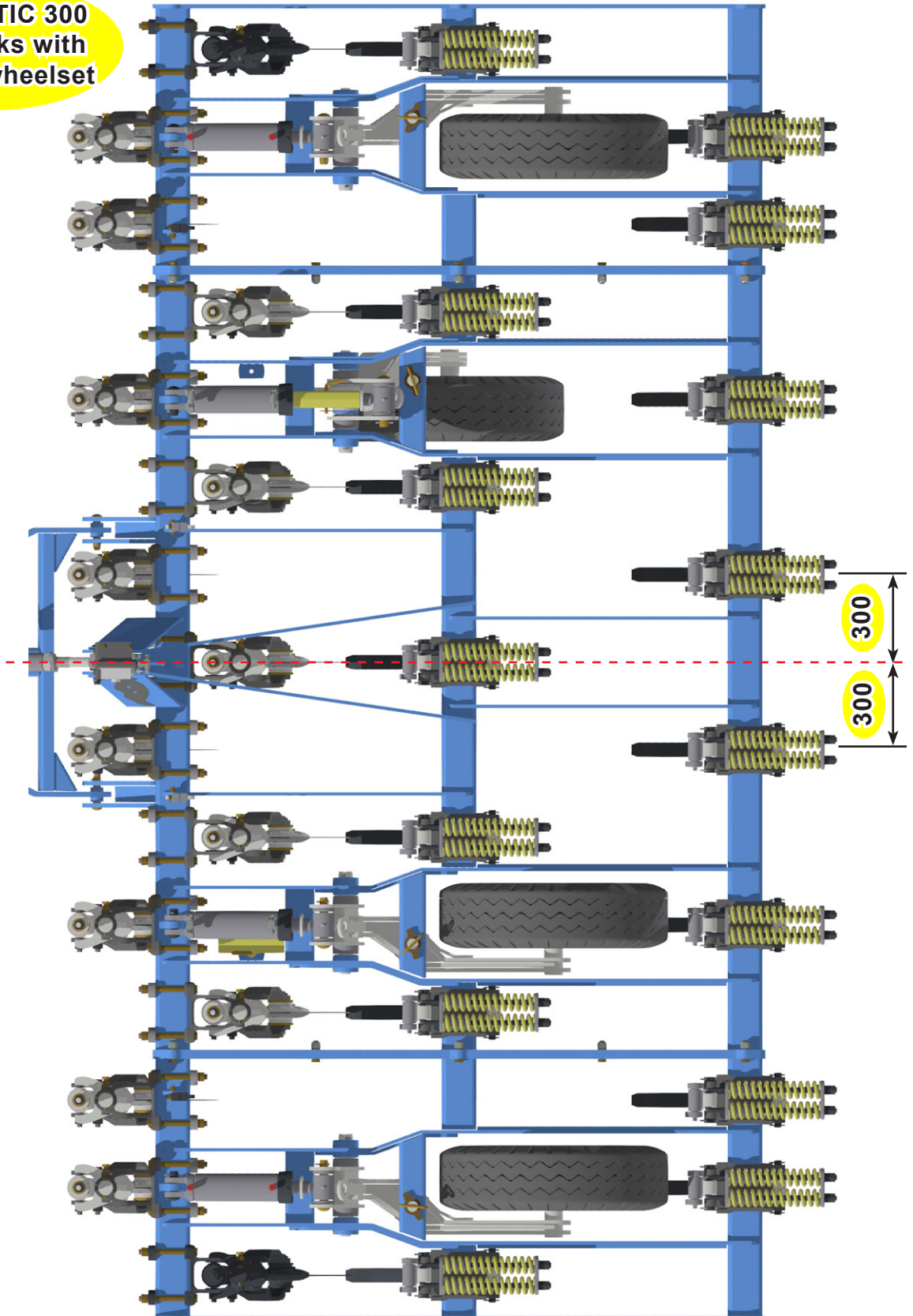
EST/MATIC 300
15 shanks



Assembly

Shanks and disc blades position

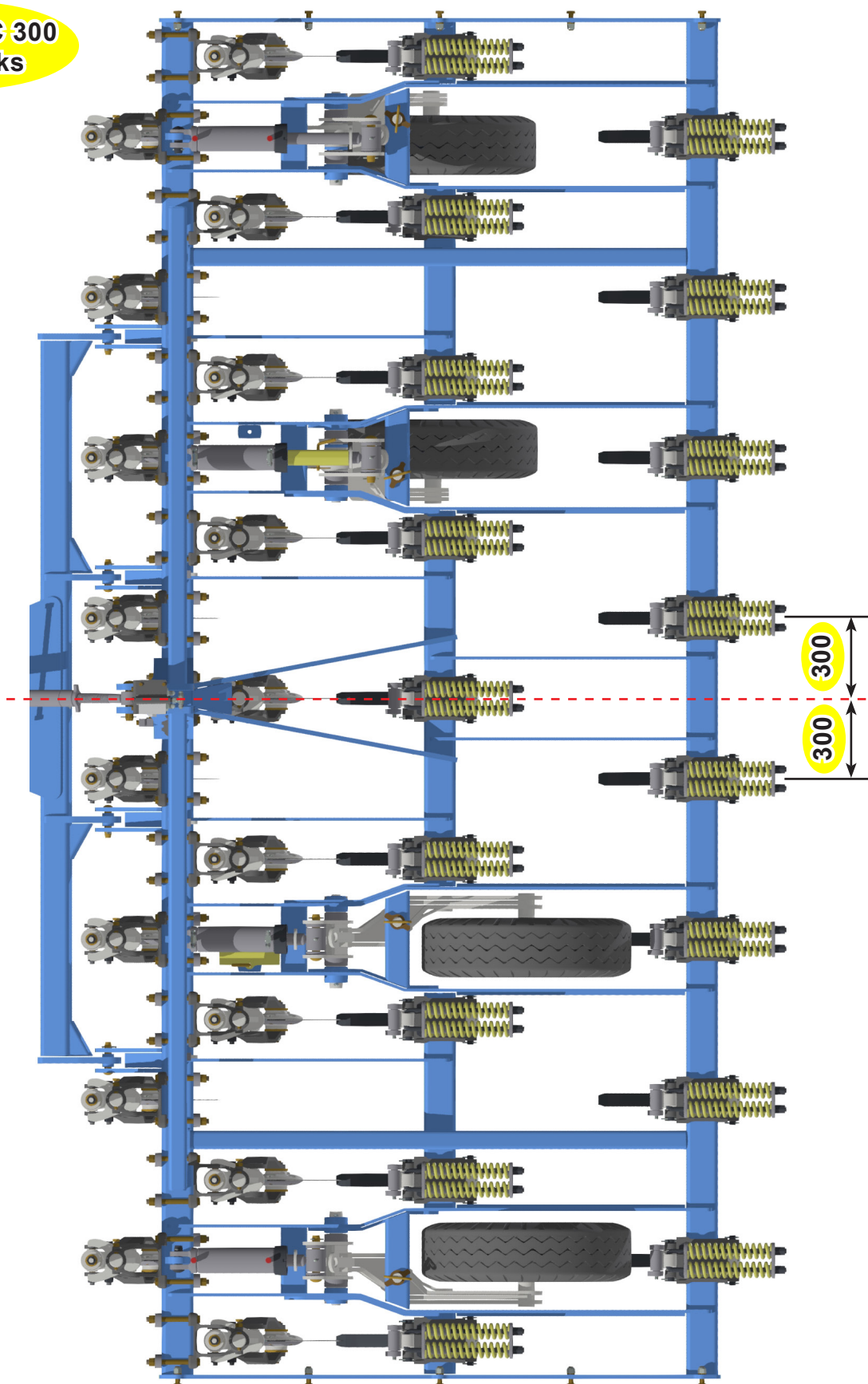
EST/MATIC 300
15 shanks with
double wheelset



Assembly

Shanks and disc blades position

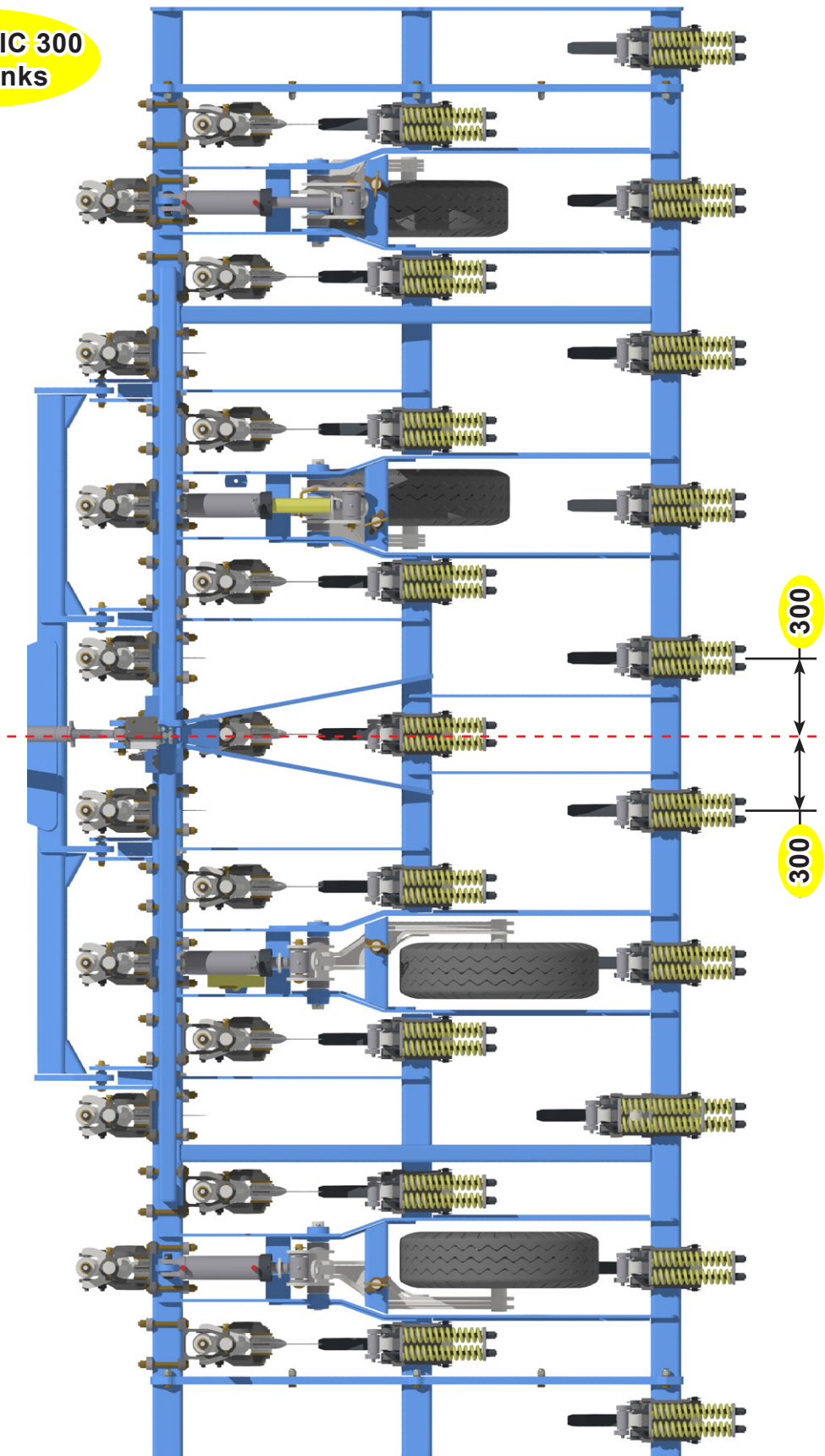
EST/MATIC 300
17 shanks



Assembly

Shanks and disc blades position

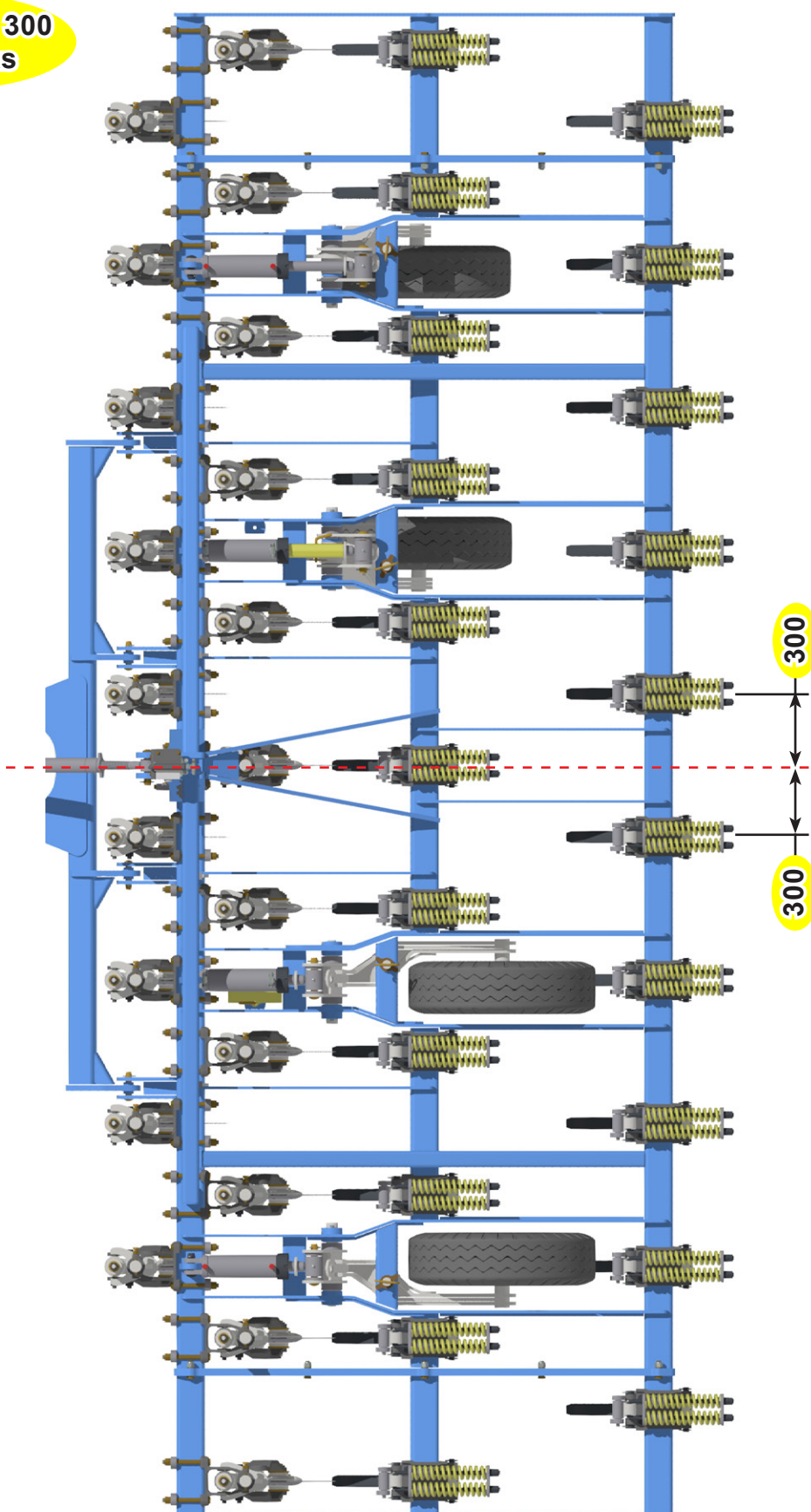
EST/MATIC 300
19 shanks



Assembly

Shanks and disc blades position

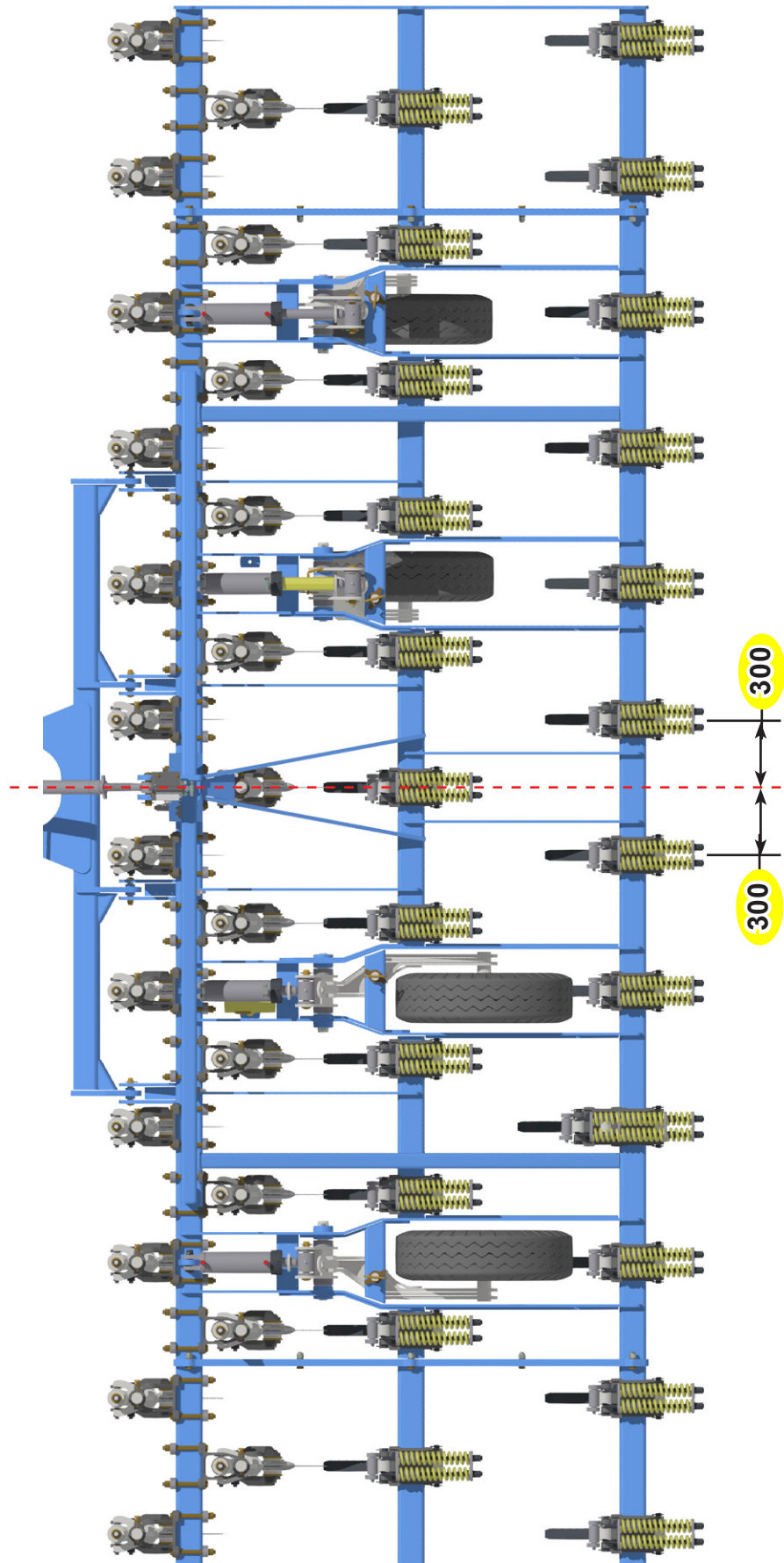
EST/MATIC 300
21 shanks



Assembly

Shanks and disc blades position

EST/MATIC 300
23 shanks

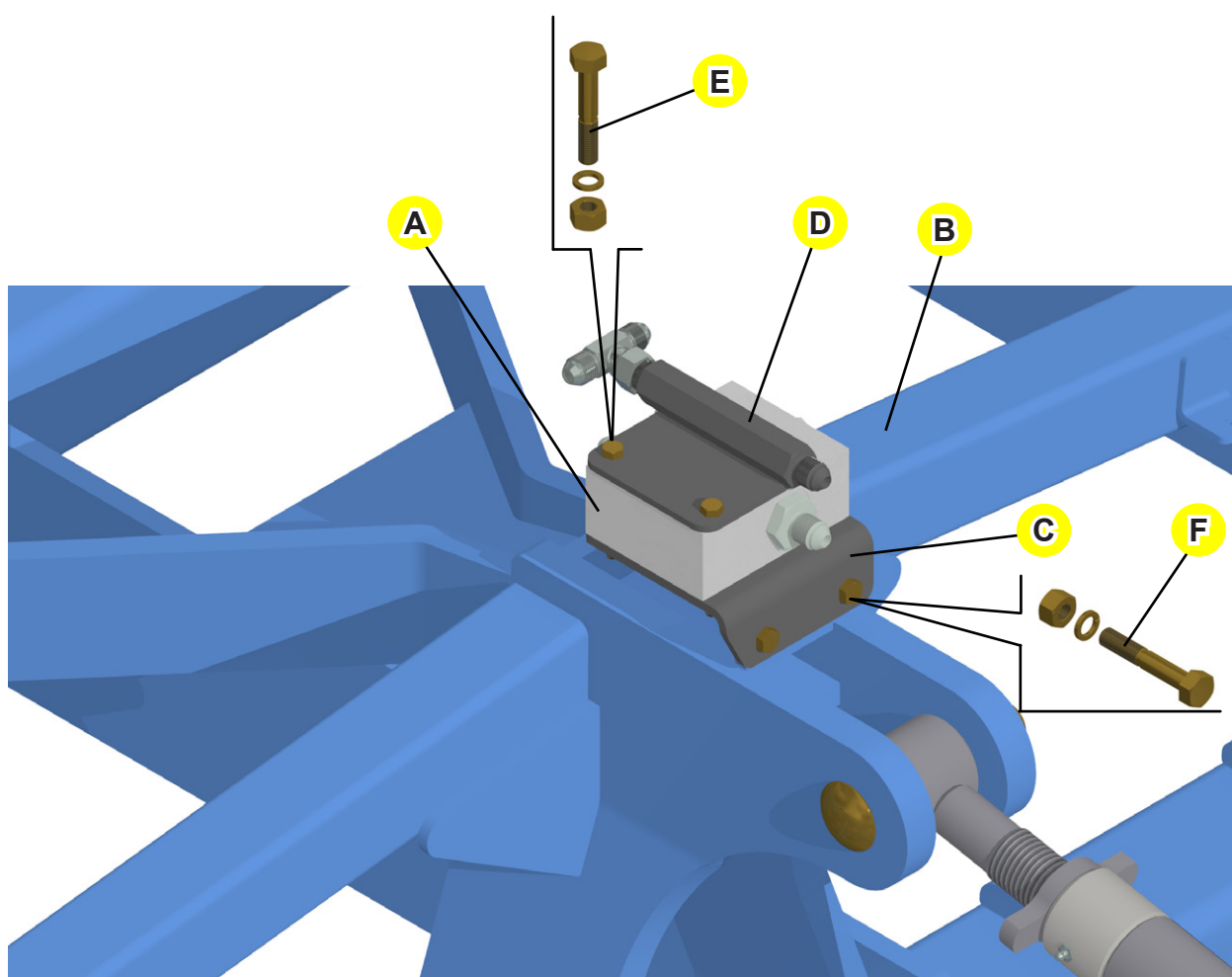


Assembly

Oil distributor assembly

Assemble the flow divider valve (A) to the center of the frame (B) using the valve support (C) along with the oil distributor (D), fastening to the support (C) using a bolt (E), spring washer and nut.

Assemble the valve support (C) to the frame (B) using bolts (F), spring washers and nuts.



NOTE

- If necessary, use thread sealing tape to couple the hoses and the 'male' part of the quick couplers.
- Assemble the hoses carefully.

Assembly

Wheelset hydraulic circuit assembly (9 and 11 shanks)

EST/MATIC 300			
Item	Quantity	Frame with 9 and 11 shanks	
01	01	3/8 X 1200 TR-TC hose	Pressure
02	01	3/8 X 1500 TR-TC hose	Return
03	01	3/8 X 2700 TC-TC hose	Pressure / Return
04	01	3/8 X 3000 TR-TM hose	Return
05	01	3/8 X 3000 TR-TM hose	Pressure
06	01	Greater hydraulic cylinder	
07	01	Smaller hydraulic cylinder	
08	01	Oil distributor	
09	02	Male quick coupler	

NOTE

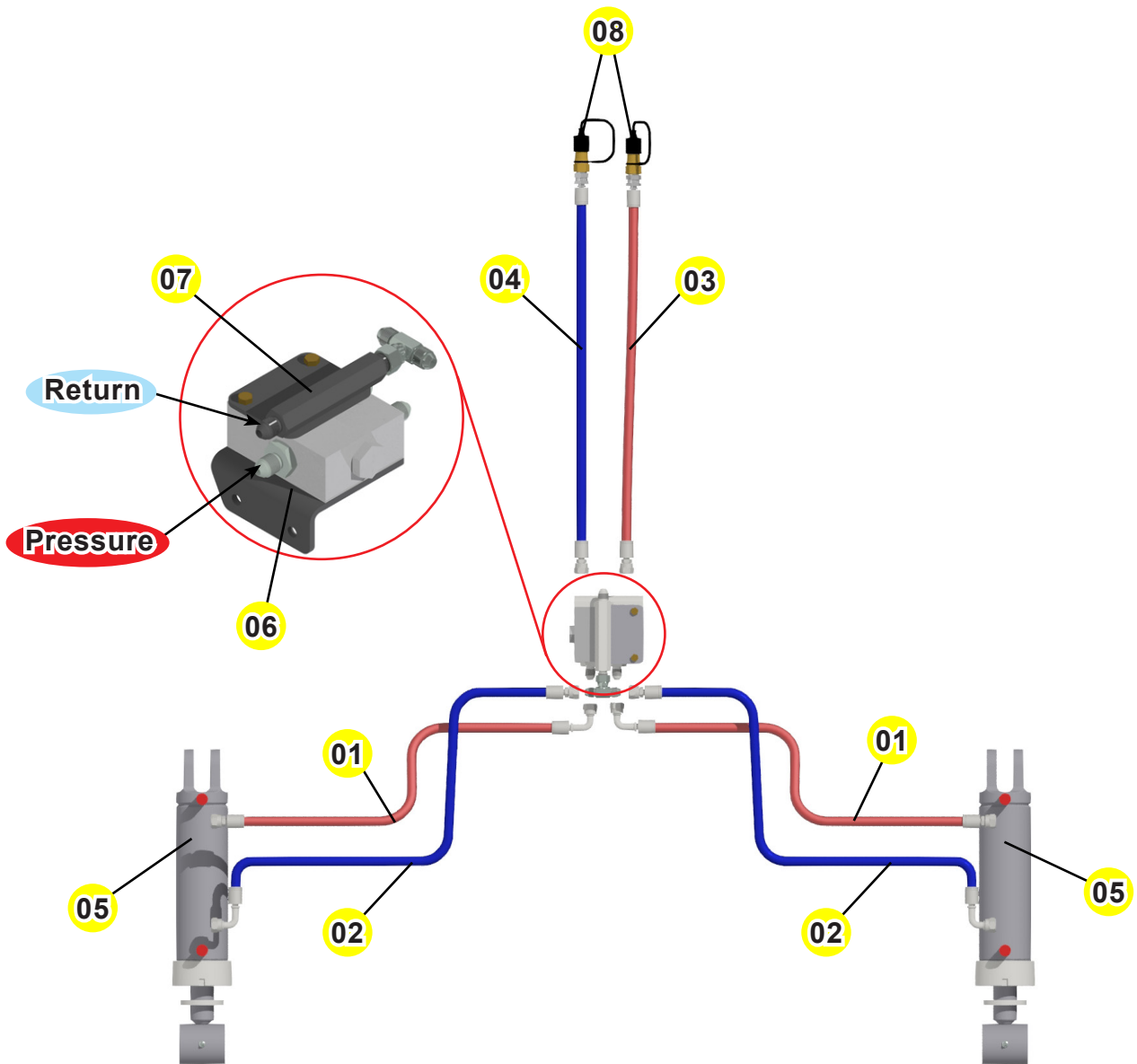
- Assemble the hoses carefully.
- After assembling the equipment, activate the hydraulic circuit so just one side of the equipment will lift up. Activate some more until the equipment is leveled.
- The return of the BP TELL cylinder must be the activation pressure of the smaller cylinder.
- This procedure is executed just once so the hydraulic circuit is filled completely, thus the other activations will carry out the operation with a leveled equipment.

IMPORTANT

- Frequently observe the general condition of connectors, hoses and cylinders to assure that there are no defects, wears or leakings.
- Use thread sealing tape to couple the hoses to the male quick couplers.

Assembly

Wheelset hydraulic circuit assembly (13 and 15 shanks)



Assembly

Wheelset hydraulic circuit assembly (13 and 15 shanks)

EST/MATIC 300			
Item	Quantity	Frame with 13 and 15 shanks	
01	02	3/8 X 1200 TR-TC hose	Pressure
02	02	3/8 X 1400 TR-TC hose	Return
03	01	3/8 X 3000 TR-TM hose	Pressure
04	01	3/8 X 3000 TR-TM hose	Return
05	01	Greater hydraulic cylinder	
06	01	Oil divider valve	
07	01	Oil distributor	
08	02	Male quick coupler	

NOTE

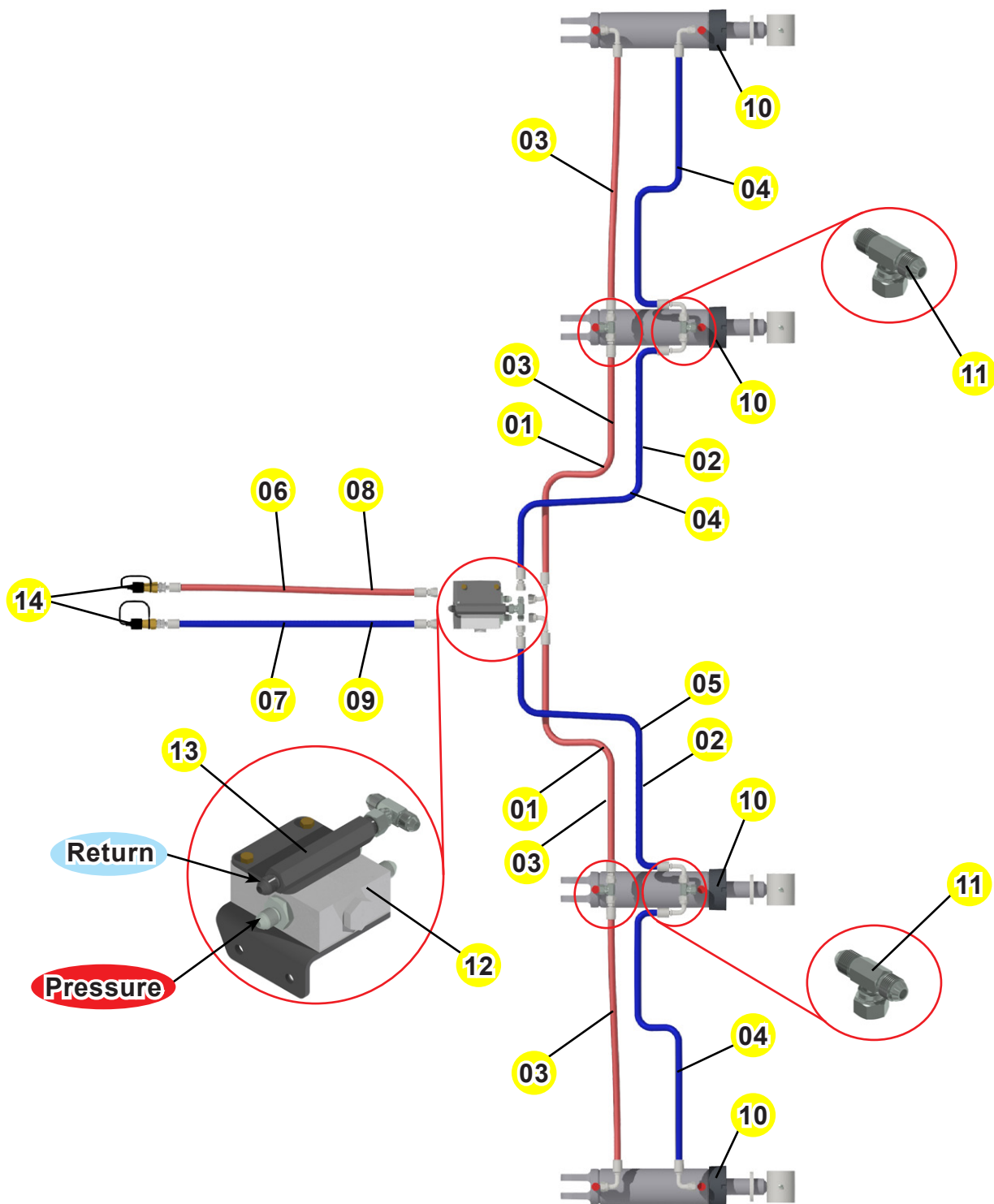
- Assemble the hoses carefully.
- After assembling the equipment, activate the hydraulic circuit so just one side of the equipment will lift up. Activate some more until the equipment is leveled.
- This procedure is executed just once so the hydraulic circuit is filled completely, thus the other activations will carry out the operation with a leveled equipment.

IMPORTANT

- Frequently observe the general condition of connectors, hoses and cylinders to assure that there are no defects, wears or leakings.
- Use thread sealing tape to couple the hoses to the male quick couplers.

Assembly

Wheelset hydraulic circuit assembly (15 to 23 shanks)



NOTE

- After assembling the equipment, activate the hydraulic circuit so just one side of the equipment will lift up. Activate some more until the equipment is leveled.
- This procedure is executed just once so the hydraulic circuit is filled completely, thus the other activations will carry out the operation with a leveled equipment.

Assembly

Hoses assembly (15 to 23 shanks)

		EST/MATIC 300						
Item	Description	Quantity						
		15 S	17 S	19 S	21 S	23 S		
01	3/8 X 1200 TR-TC hose	02	---	---	---	---	---	Pressure
02	3/8 X 1400 TC-TC hose	02	---	---	---	---	---	Return
03	3/8 X 1400 TR-TC hose	02	04	04	04	04	04	Pressure
04	3/8 X 1400 TR-TC hose	02	02	02	02	02	02	Return
05	3/8 X 1700 TC-TC hose	---	02	02	02	02	02	Return
06	3/8 X 3000 TR-TM hose	01	---	---	---	---	---	Pressure
07	3/8 X 3000 TR-TM hose	01	---	---	---	---	---	Return
08	3/8 X 3800 TR-TM hose	---	01	01	01	01	01	Pressure
09	3/8 X 3800 TR-TM hose	---	01	01	01	01	01	Return
10	Hydraulic cylinder						04	
11	T male adapter with nut						04	
12	Oil divider valve						01	
13	Oil distributor						01	
14	Male quick coupler						02	

IMPORTANT

- Frequently observe the general condition of connectors, hoses and cylinders to assure that there are no defects, wears or leakings.
- Use thread sealing tape to couple the hoses to the male quick couplers.

Assembly

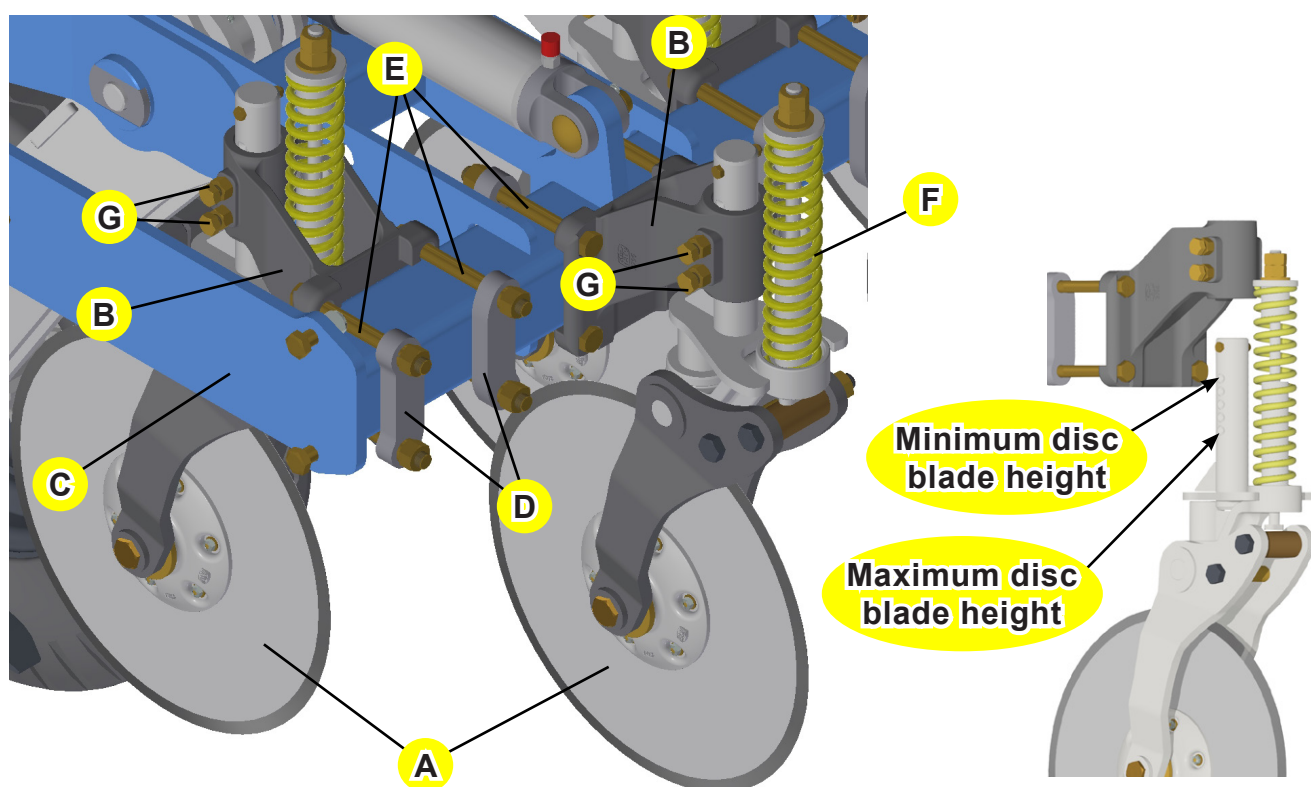
Disc blades assembly

The disc blades have oscillation movements to follow the curves on the ground.

During working, **do not perform sharp turns**, as it may damage some components.

Disc gangs assembly:

- Couple the disc blade (A) to the fixation support (B) and lock it to the frame (C) using the fixation plate (D), bolts (E), spring washers and nuts;
- The vertical oscillation (or flotation) of the disc is provided by the spring (F), which allows the necessary articulation to follow the soil profile and to pass obstacles;
- The height adjustment of the disc blades related to the soil must be used to increase or decrease the cutting depth of the discs through the bolts (G).



- NOTE**
- Adjust the discs height according to the straw thickness. Avoid to deepen the discs unnecessarily.
 - The disc blade spring (F) is adjusted on the factory, which must not be altered.
 - The disc blades must always be aligned with their rods. The discs depth adjustment must be equal to all of them.
 - To work on a depth range going from 150 to 300 mm, the disc blade must be assembled on its maximum height.

Assembly

Cage roller assembly

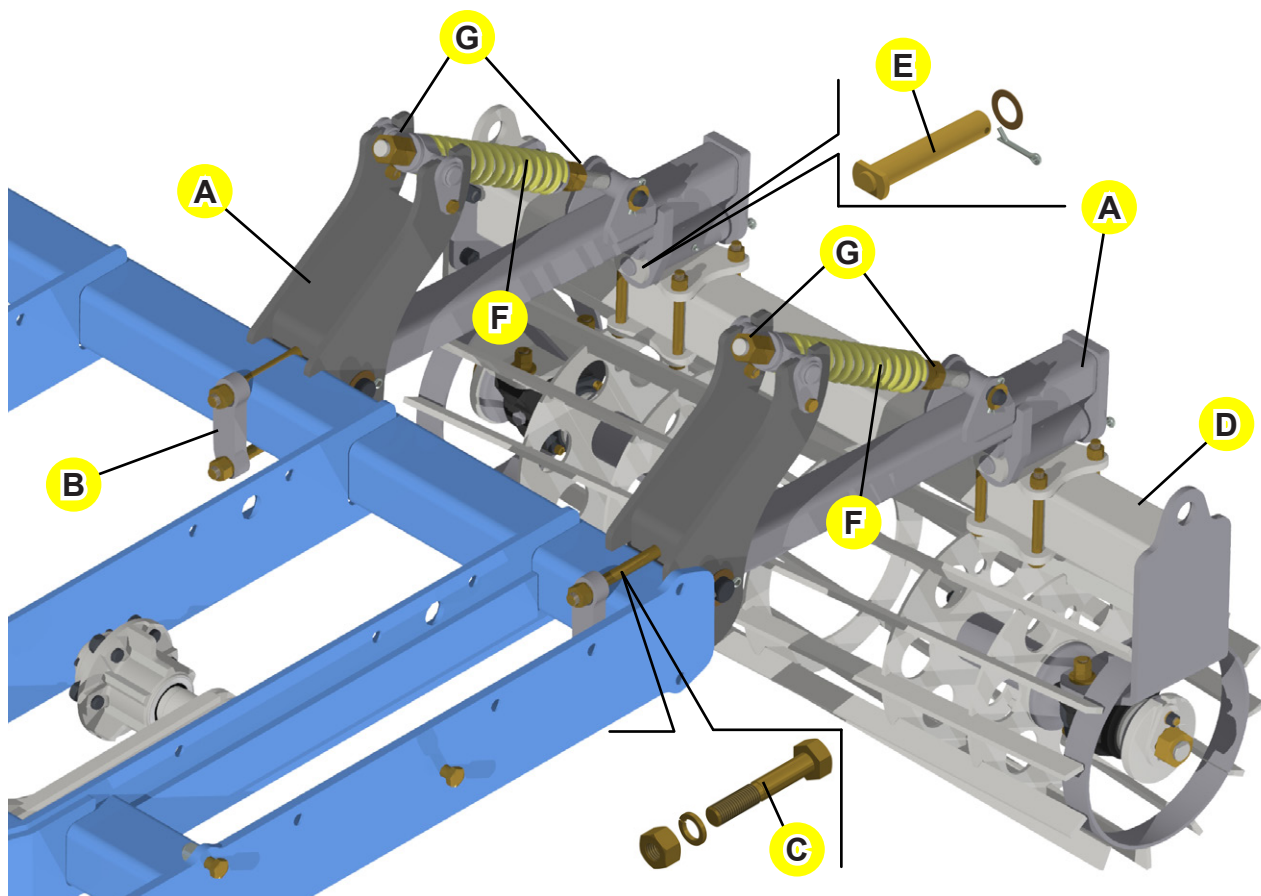
To couple the plow, proceed as follows:

Couple the cage roller bars (A) to the rear tube of the frame without totally tightening it using clamps (B), bolts (C), spring washers and nuts.

Then, couple the cage roller (D) to the bars (A) using articulation axles (E), flat washer and cotter pin.

Tighten the whole set.

Support the cage roller (D) on the field and relieve the pressure on the spring (F) by loosening the nuts (G).



- NOTE**
- The distance between a fixation support and another is determined by the working width of the plow.
 - The spring (F) must be adjusted in a way that the pressure will be evenly distributed in the whole cage roller extension. The pressure must be adjusted in a way that the equipment will not be hang, as it may cause alterations on the subsoiling uniformity.
 - This procedure is useful for when the equipment is plowing, as the springs (F) will not be crushed with the cage roller (D) oscillation.
 - An excessive tightening on the nuts (G) that adjust the pressure may cause damages to the cage roller bar (A).

Set-up instructions

The following instructions must be carefully followed in order to achieve the best performance during the job.

Preparing the tractor

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

Preparing the equipment

Check the conditions of all parts and retighten nuts and bolts, especially the ones on the shanks and on the disc blades. If these parts work loose, there may be damages to the components.

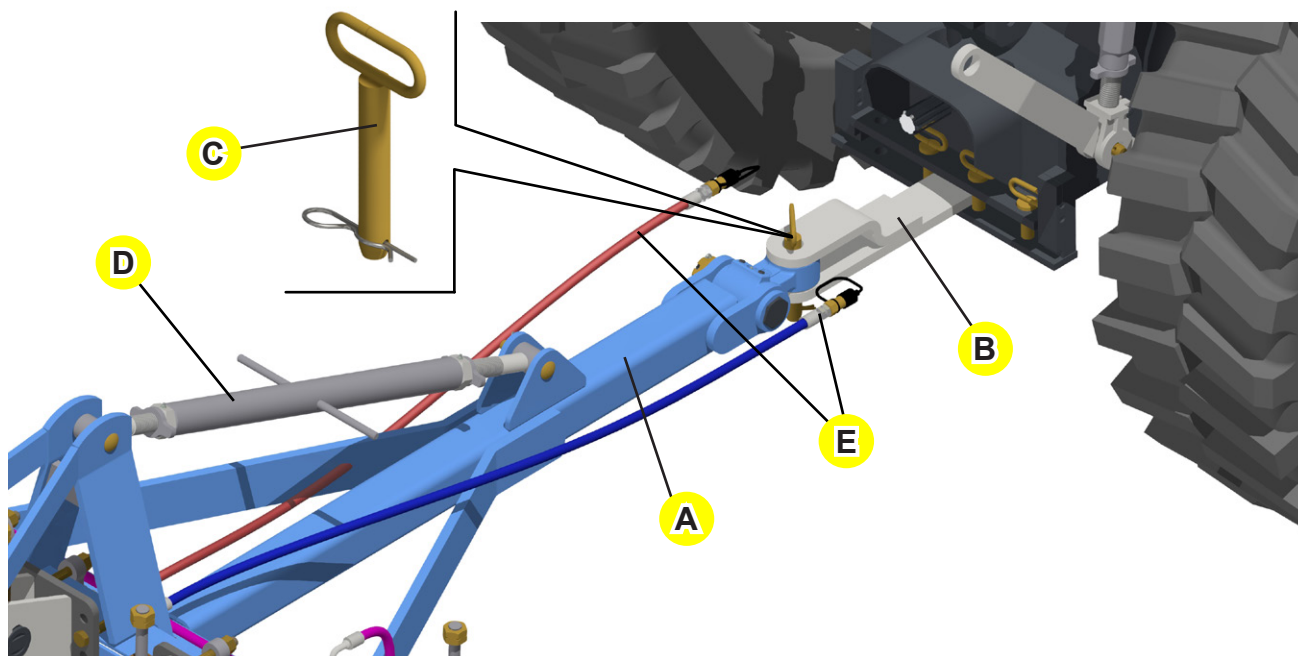
Check the tires inflation and keep the same pressure on them.

Lubricate all grease fittings appropriately. (Check the 'lubrication' section).

Hitching to the tractor

Couple the equipment to the tractor by hitching the drawbar (A) to the hitch bar (B) using a pin (C).

If necessary, use the extensor arm (D) to facilitate hitching.



ATTENTION

- The tractor hitch bar must remain fixed and centralized.
- The pin (C) is not an included part on some equipment models.
- During transportation, the lower hydraulic arms must remain lifted.

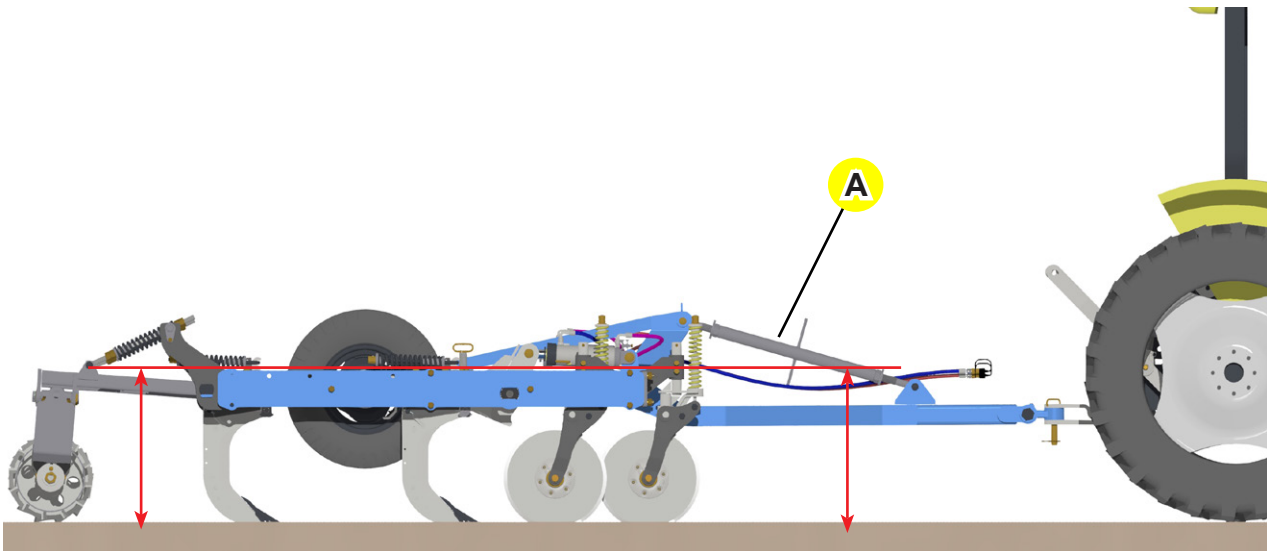
Set-up instructions

Hitching to the tractor

To couple the hydraulic cylinder hoses (E) to the remote control couplers of the tractor, turn off the tractor engine, relieve the control valve pressure by activating the lever a couple of times and check if the quick couplers are clean.

Leveling the plow

Level the plow through the extensor arm (A).



Set-up instructions

Important recommendations

Before starting the subsoiling job, inspect the plow and retighten all bolts and nuts; also check the conditions of all pins and cotter pins to avoid future damages. Repeat this operation after the first day of work.

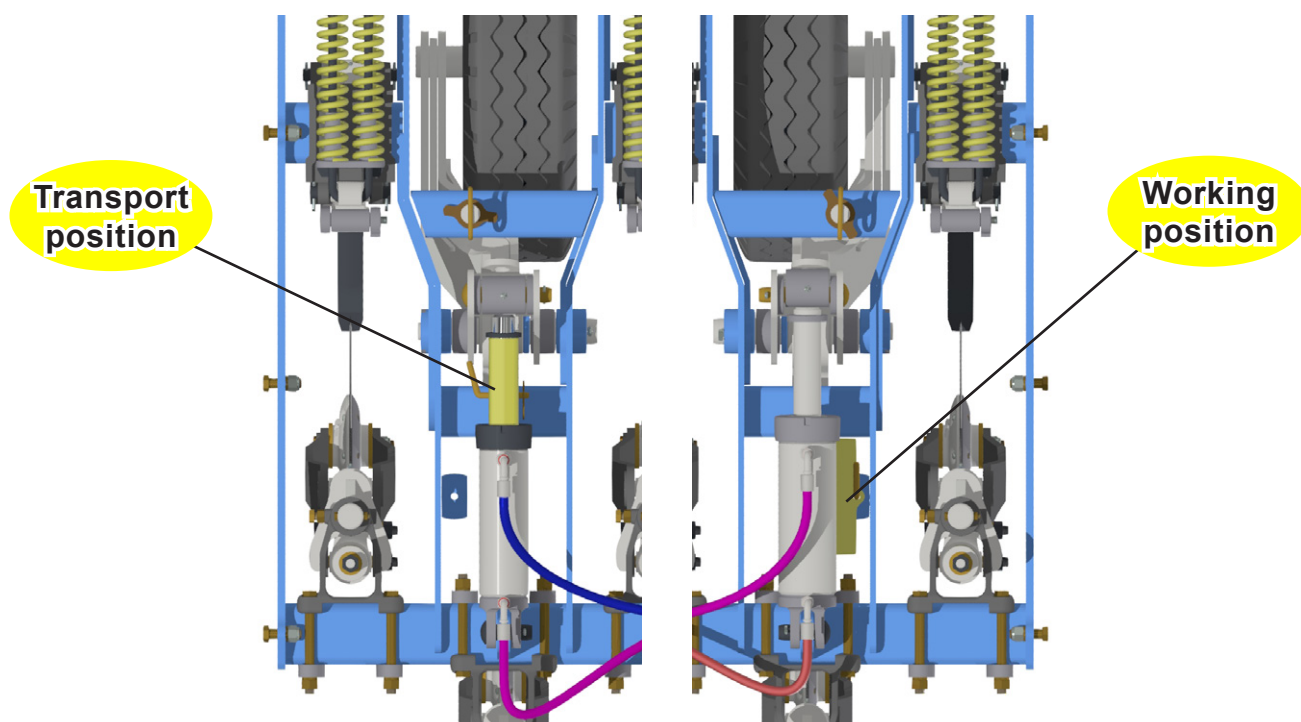
The tractor drawbar must remain fixed and centralized.

It is really important to check the tires inflation and to keep the same pressure on both of them.

Before connecting the equipment hoses to the tractor, check if the hose is pressurized. If the answer is positive, the operator will not be able to connect the male part to the female one - and forcing this operation may lead to severe damages to the eye and skin as the fluid may escape. To remove the pressure on the tip of the hose, press the male coupling against a non-metallic surface to move the retention valve, until there is no oil leakage anymore.

Activate the control valve lever and check for any leaks on the terminals and on the quick couplers.

To transport the equipment, it is necessary to use the transport locks which are coupled to the hydraulic cylinder rods. When they are not being used, the safety locks must remain fixed to the equipment on their appropriate place.



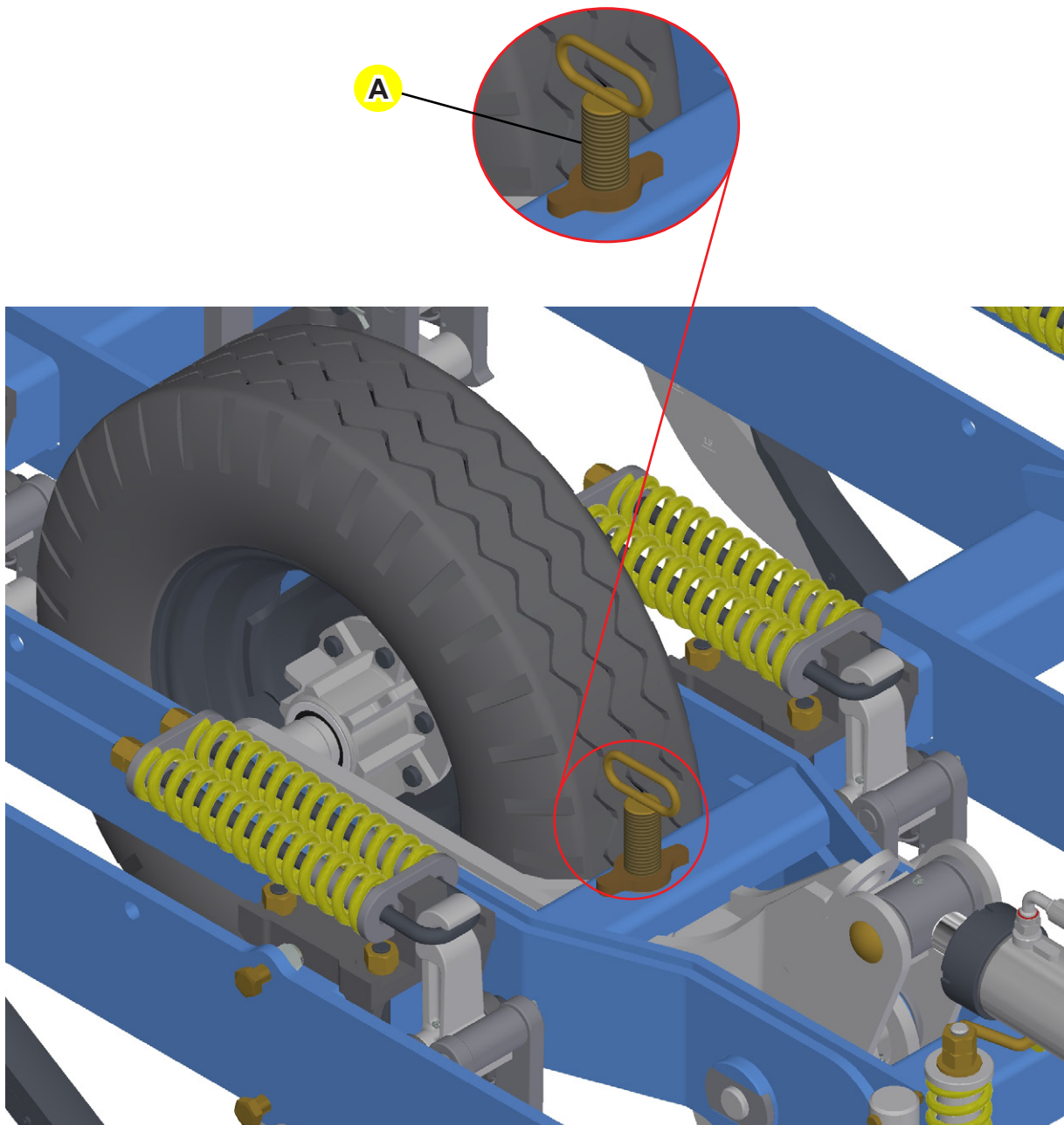
Adjustments and operations

Shanks depth adjustment

The shanks working depth is controlled through the wheels by the hydraulic cylinders activation.

To set the shanks working depth, use the cylinder stops (A), which will limit the cylinder rods movement.

After the adjustment, the depth will always be the same; this occurs because the stops are limiting the cylinder movement, therefore preventing the wheels from oscillate and always keeping the same depth.



NOTE • The working depth will be indicated by the scale on the shanks.

Adjustments and operations

Shanks depth adjustment

The working depth must be adjusted regarding the depth of the compacted layer on the soil.

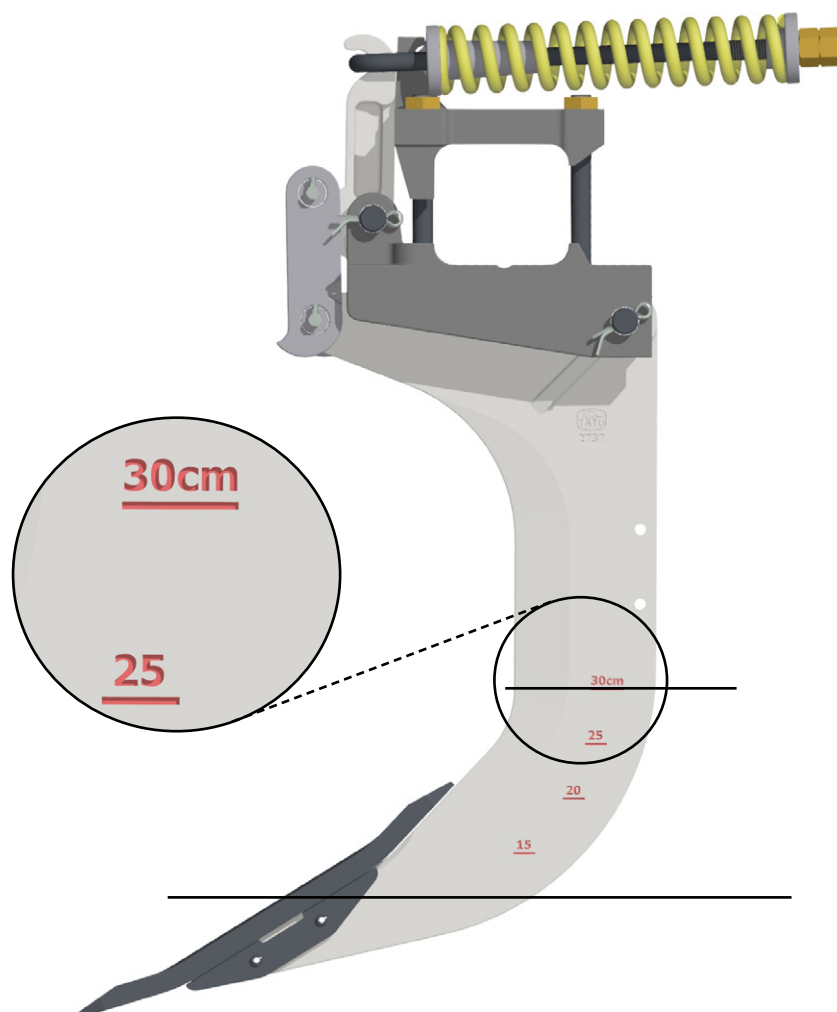
To do so, use devices such as penetrometers or, to simplify, open trenches with the aid of any sharp tool and find the depth of the compacted layer.

Besides the depth, it is also necessary to know the thickness of this layer.

It is necessary to know these points to adjust the working depth properly and avoid wastes, such as: high skidding index, high use of fuel, greater wear on the tires and low income.

Another factor to pay attention is the soil humidity rate. An ideal soil is a friable one (one that breaks or crumbles with easiness).

The humidity factor is easy to understand, because when working with high humidity, the shanks will pass over the soil but not penetrate. If the soil is completely dry, the job will remove great clods, which are hard to destroy afterwards.



Adjustments and operations

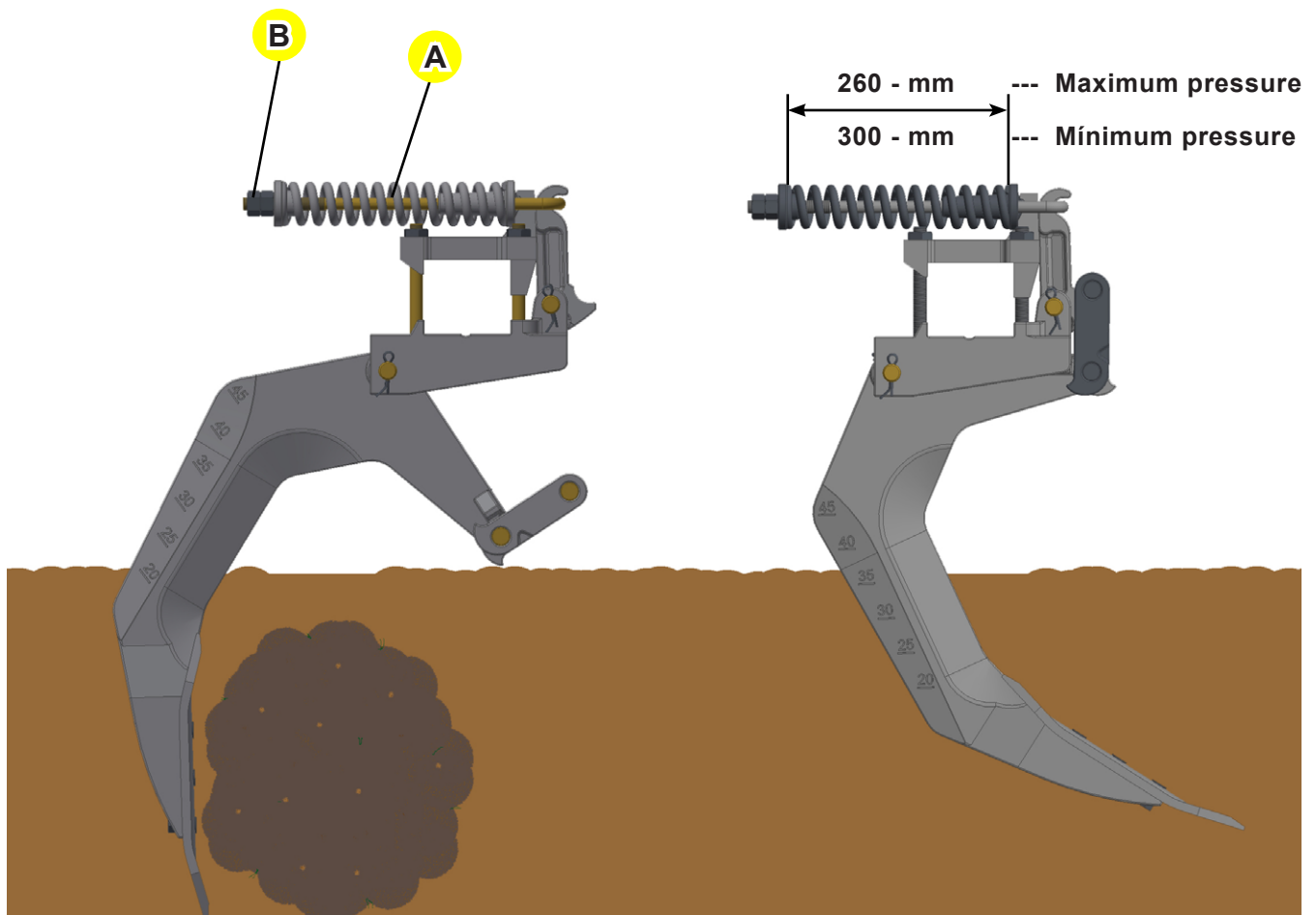
Automatic retrieving of the shanks

This safety system with a coil spring allows that the subsoiling shanks retrieve when facing any obstacle. To return to working position it is just necessary to lift the plow, not being necessary to use reverse gear.

Shank retrieving pressure adjustment

If the soil is free from obstacles such as stones, roots and others, the pressure adjustment springs (A) must have a length of **300 mm** (Minimum pressure). Loosen up the nuts (B) alternately until the springs (A) reach the desired length.

To increase the retrieving resistance over soil with obstacles, the springs can be adjusted up to **260 mm** (Maximum pressure).



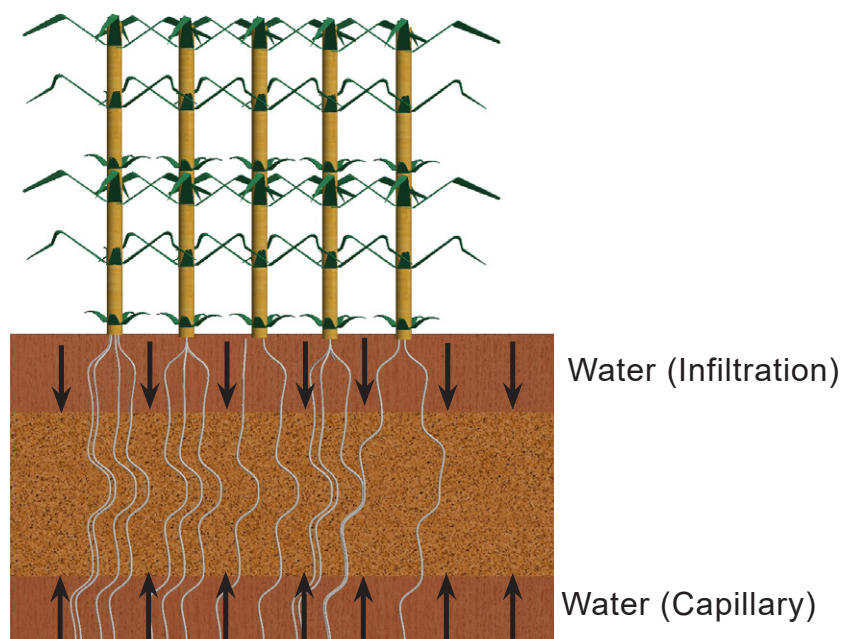
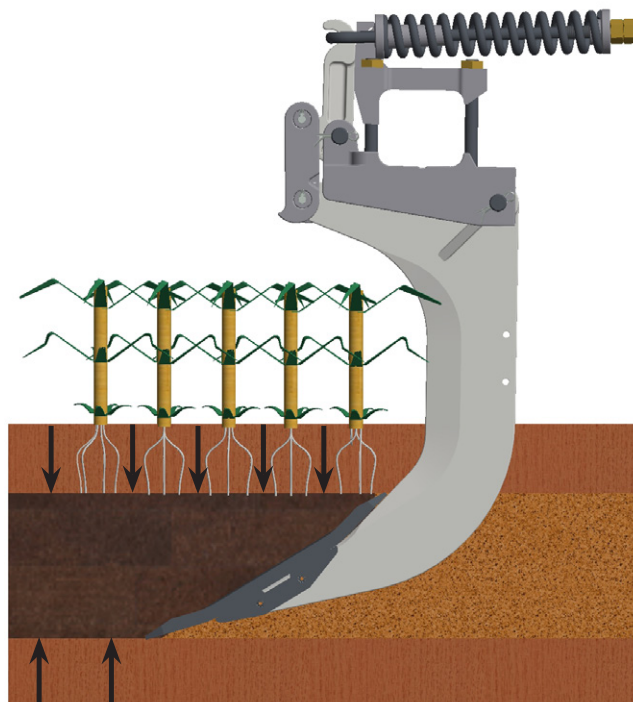
NOTE

- Never work with a spring length inferior than 260 mm, as the system may lock and prejudice the equipment. For a better efficiency, work using the smaller possible pressure (considering normal working conditions), so the shank will not retrieve frequently.

Adjustments and operations

How to perform the subsoiling job

The main function of the subsoiling plow is to break the compacted layer that forms on the soil, specially over fields that adopt the no-till plantation. The soil will start to be compressed on these fields (on a depth of 30 cm) due to equipments driving over it. Use the subsoiler to break that layer and also to establish the cultures for soil coverage during winter and the rooting of those on an uncompressed soil. This assures a greater rain water infiltration, thus allowing a better development of the plants roots and a damage decrease that would be caused by erosion.



Adjustments and operations

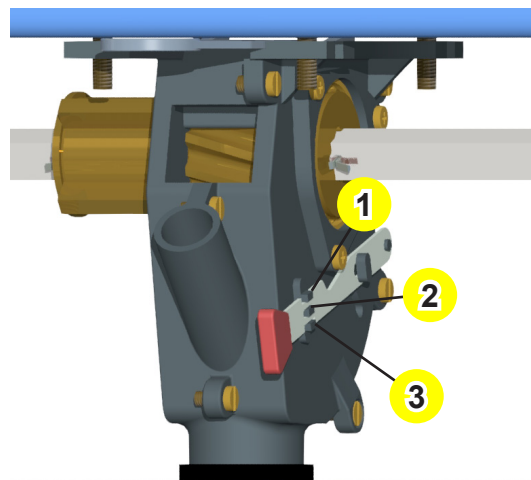
Fine seeds distribution

The fine seed hoppers have **03** (three) adjustment points, which are used according to the different size of grains, being:

Adjustment 1: For small seeds of wheat, rice, oat and similar.

Adjustment 2: For medium seeds of soy, rice, peas and similar.

Adjustment 3: For great seeds of soy, etc.

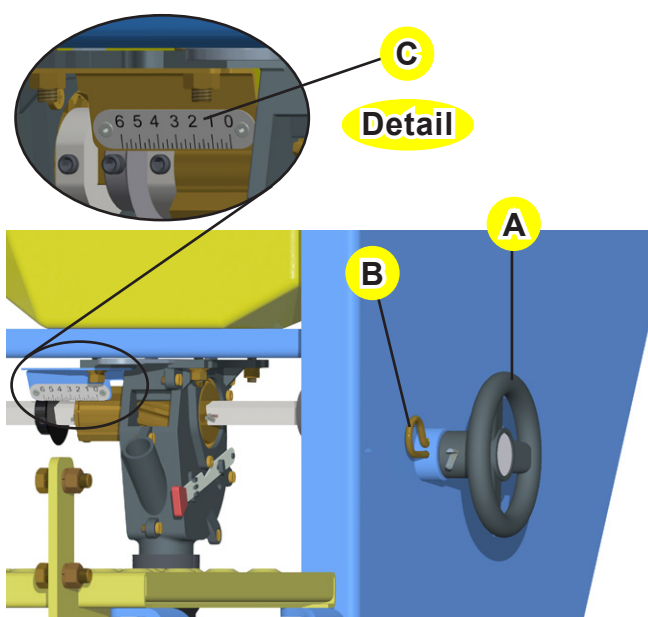


ATTENTION Failure to follow the previous instructions may lead to:

- Damages to the seeds.
- Alteration on the distributed amount.

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

- Mark the distance for the test. Fertilizer table example: 50 linear meters.
- Fill up the planter hoppers at least to the half and then travel some meters to completely fill the meterings before entering in the delimited area;
- Place the collection bags in the seed dispensers (preferably use plastic bags).
- Drive the tractor in the delimited space (50 linear meters), using the same speed that will be used in the whole plantation;
- Remove the collection bags from the seed dispensers to weigh them;



- After getting the desired amount and still in the field, move the tractor in the same speed, leaving the seed to reach the soil for better verifying the distribution uniformity.

The amount of seeds is adjusted through the wheel handle (A) as follows:

- Remove the cotter pin (B) from the wheel handle;
- To determine the approximated amounts in kilograms per hectare (**kg/ha**), turn the wheel handle (A) until reaching the desired amount by checking on the scale (C);
- Lock the wheel handle by replacing the cotter pin (B) after the final adjustment.

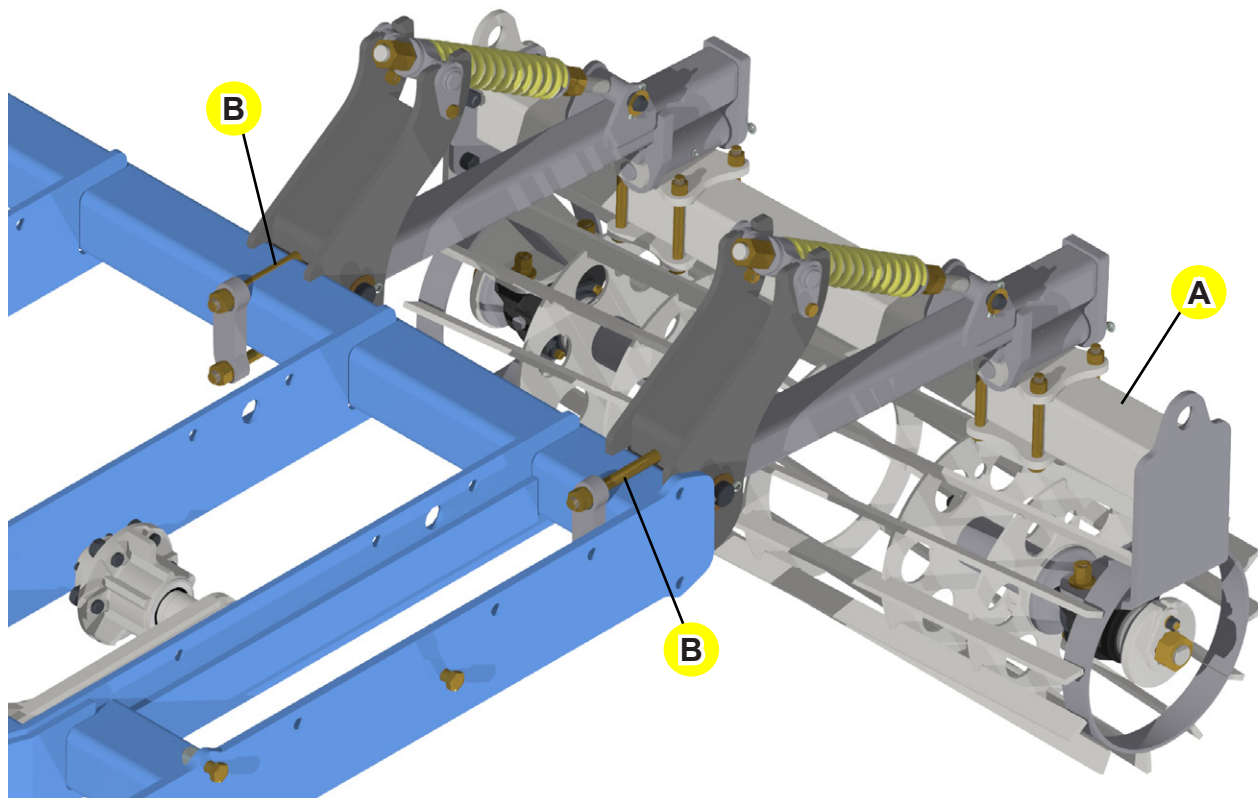
Adjustments and operations

Subsoiler transportation with cage roller

The cage roller function is to reduce the earth clods, thus facilitating the job of other equipments and leaving a pre-leveled soil. (Check the 'Cage roller assembly' page).

For models with 9 and 15 shanks - double cage rollers.

For models with 17, 19 and 23 shanks - triple cage rollers.



When transporting the equipment to greater distances over a truck or trailer, follow the instructions below:

Release the cage roller (A) completely by loosening the bolts (B), spring pressure and nuts.

NOTE • The operator must move the cage roller with the aid of a hoist to avoid serious accidents.

Adjustments and operations

Troubleshooting guide

PROBLEM	CAUSES	POSSIBLE SOLUTIONS
Crooked frame or with cracks.	Maneuvers or finishing procedures in a short radius, being the equipment lowered.	Perform the maneuvers being the equipment lifted.
	Excessive tightening on the springs.	Adjust the springs pressure.
	Parts with an inferior quality than the requested one.	Replace these parts for original ones.
Shanks are not retrieving.	Stuck shanks.	Lubricate with oil or replace them.
	Excessive tightening on the springs.	Adjust the spring pressure.
Shanks are not penetrating on the soil.	Unaligned working position.	Adjust the hitching height along with the hitch bar and stabilizer.
	Worn out tips.	Invert their positions or replace them.
	Depth adjustment bolt with limited movement.	Turn the bolts in a counterclockwise direction until the desired penetration is achieved. Keep the bolts on the same adjustment.
Shanks are retrieving quite often.	Area with several obstacles, such as stones, roots and others.	Reduce the speed or avoid this area.
	Soil with a great compaction rate.	Reduce the speed or replace the tips.
	Tractor power and working speed above the recommended.	Follow the recommended working speed/ tractor power.
	Insufficient spring pressure.	Adjust the spring pressure.
	Shank with great wear on the roller fitting.	Replace the shank extension.
Quick couplers are not adapting.	Different type of couplers.	Replace the male and female couplers and use couplers from the same type.
Quick couplers are not connecting.	Hoses under pressure.	Press the male quick coupler against a non-metallic surface to move the retention valve.
Leaking on the hoses with fixed terminals.	Insufficient tightening.	Retighten carefully.
	Lack of sealing material on the thread.	Use thread sealing tape and retighten carefully.

Adjustments and operations

Troubleshooting guide

PROBLEM	CAUSES	POSSIBLE SOLUTIONS
Hydraulic cylinder leaking.	Damaged repairs.	Replace the repairs.
	Damaged shank.	Replace the shank.
	Oil with impurities.	Replace oil, repairs and filtering elements.
	Working pressure greater than the recommended one.	Adjust the command through the valve with the aid of a manometer. Normal pressure: 180 Kg/cm ² .
Quick couplers leaking.	Insufficient tightening.	Retighten carefully.
	Lack of sealing material on the thread.	Use thread sealing tape and retighten carefully.
	Damaged repairs.	Replace the repairs.
Equipment is moving without activating the command.	Damaged repairs.	Replace the repairs.
	Hydraulic cylinder with damaged repairs.	Identify the cylinder and replace the repairs.
	Insufficient tightening.	Retighten carefully.
Equipment is not moving in any direction or moves with difficult.	Lack of sealing material on the thread.	Use thread sealing tape and retighten carefully.
	Defective hydraulic system on the tractor.	Use other tractor or fix the system.
	Oil level is very low.	Fill up to reach the level.
	Inverted hoses.	Assemble the hoses properly.
	Defective hydraulic cylinders.	Replace the repairs or change the cylinders.
	Insufficient hydraulic pressure on the control valve.	Adjust the command through the valve with the aid of a manometer.
Too many skips.	Obstructed or creased hydraulic conductor.	Unobstruct or change the conductors.
	Seeds with straw.	Use clean seeds.
	Debris on the metering system.	Check the outlet chute and the seed tube.

Adjustments and operations

Operations - Important points



- Retighten nuts and bolts after the first day of work. Check the conditions of all pins and cotter pins. Then, retighten every 24 service hours.
- Carefully observe the lubrication intervals.
- The tires inflation must be always done with the aid of a contention device (tire inflation cage).
- The correct inflation of the equipment tires is important; always follow the instructions on the 'tires inflation' page.
- 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 - 7 km/h, which is not advisable to overcome in order to maintain efficiency and to avoid possible damages to the equipment.
- Only people who own a complete knowledge of the tractor and equipment must operate them.
- To hitch the equipment, maneuver using a slow gear and on a wide area, being ready to brake when necessary.
- The tractor hitch bar must remain fixed and centralized.
- Always carry out the operations on a controlled and careful manner.
- When maneuvering, activate the hydraulic cylinder to totally lift the plow, thus avoiding a great effort and to not overload the traction components.
- Do not check eventual leaks using your bare hands, as the high pressure may cause injury. Use a piece of cardboard or another adequate object.
- During working (being the shanks and discs on the soil), never perform abrupt maneuvers, because the angle formed by the shanks/disc gangs will transmit a great effort to the equipment, thus overloading the traction components.
- Keep the equipment leveled.
- The cutting depth can be minimal when working on compacted soils, providing an insatisfactory operation. On these cases, we recommend the utilization of a more suitable equipment to the job.
- During working or transportation, do not allow passengers on the tractor or equipment.
- Remove sticks or any other object that may get stuck on the shanks/discs.
- Relieve the control valve pressure before relieving the quick couplers and when doing any verification on the hydraulic cylinder.
- When unhitching the equipment, do it on a flat and firm surface.
- As previously mentioned, this equipment has several adjustments, but only the local conditions can determine its best adjustment.

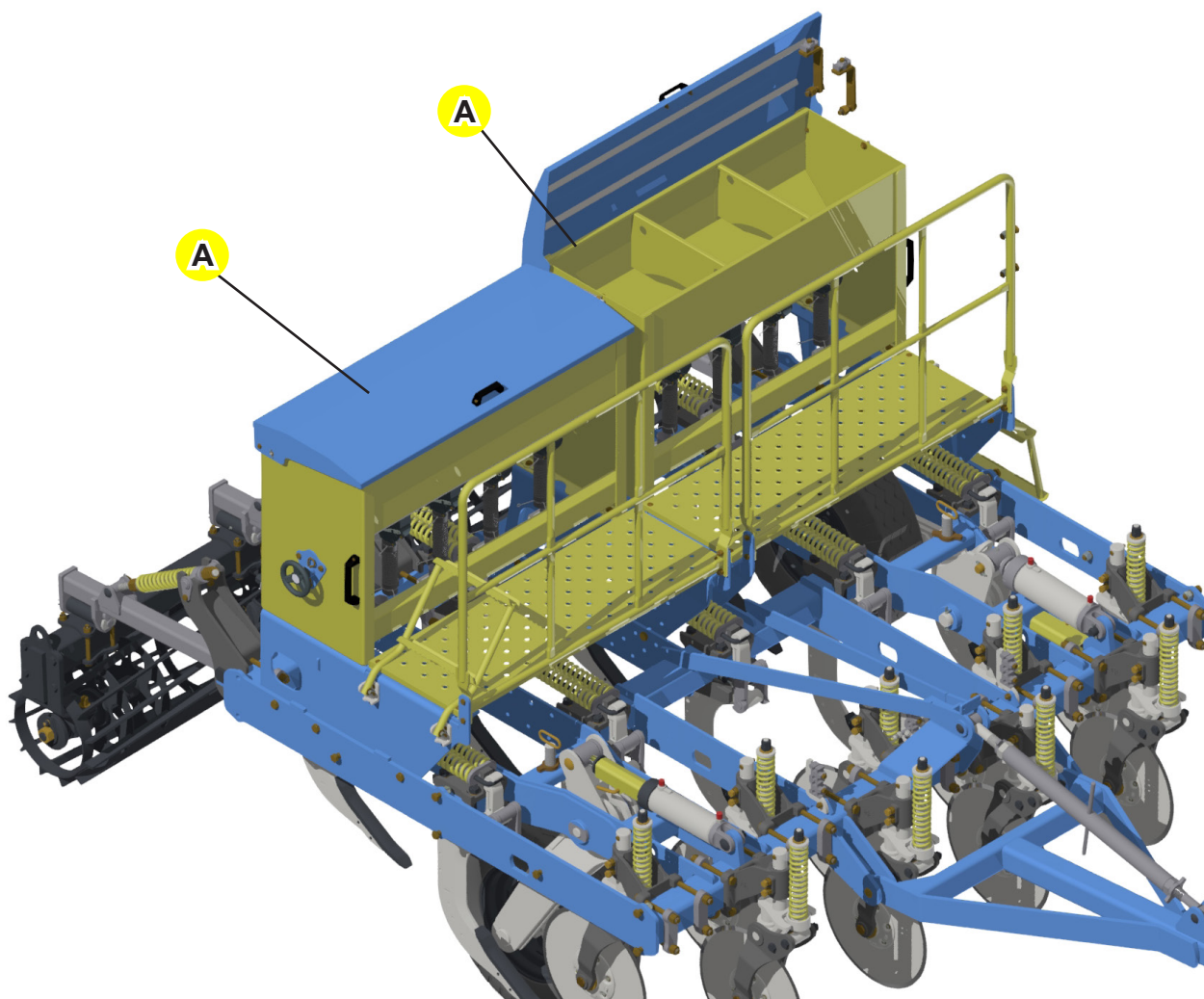
Optional

Seed hopper configuration

Marchesan optionally supplies the seed hoppers (A) for the models with 9 to 23 shanks.

Amount of seed hoppers:

- For the model with 9 shanks - 2 seed hoppers with 5 outlets each;
- For the model with 11 shanks - 2 seed hoppers with 6 outlets each;
- For the model with 13 shanks - 2 seed hoppers with 7 outlets each;
- For the model with 15 shanks - 2 seed hoppers with 8 outlets each;
- For the model with 17 shanks - 3 seed hoppers with 6 outlets each;
- For the model with 19 shanks - 2 lateral seed hoppers with 6 outlets each and one central seed hopper with 8 outlets;
- For the model with 21 shanks - 2 lateral seed hoppers with 7 outlets each and one central seed hopper with 8 outlets;
- For the model with 23 shanks - 3 seed hoppers with 8 outlets each.



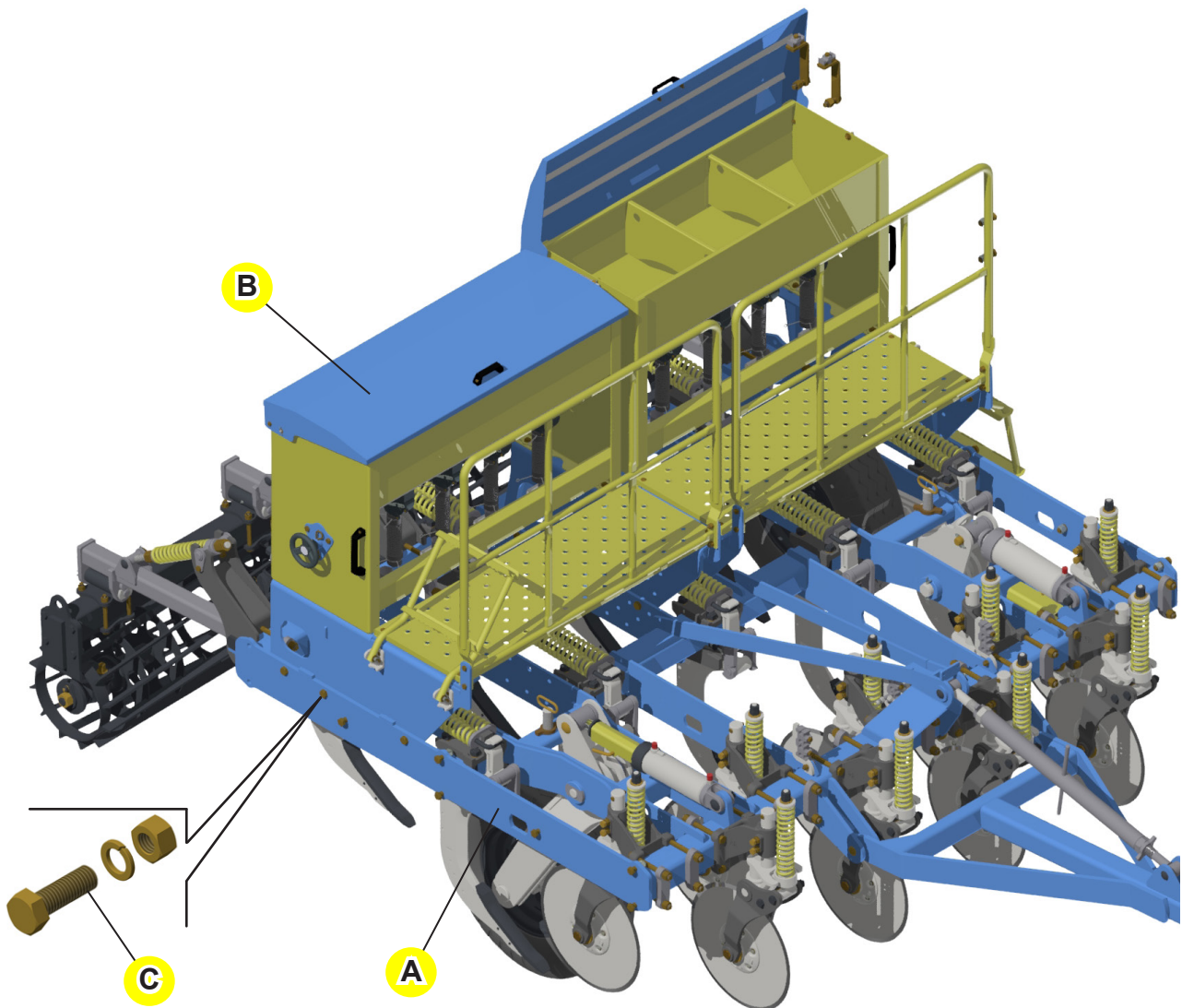
NOTE • The fine seeds hopper has a capacity of 45 liters per shank.

Optional

Seed hopper assembly

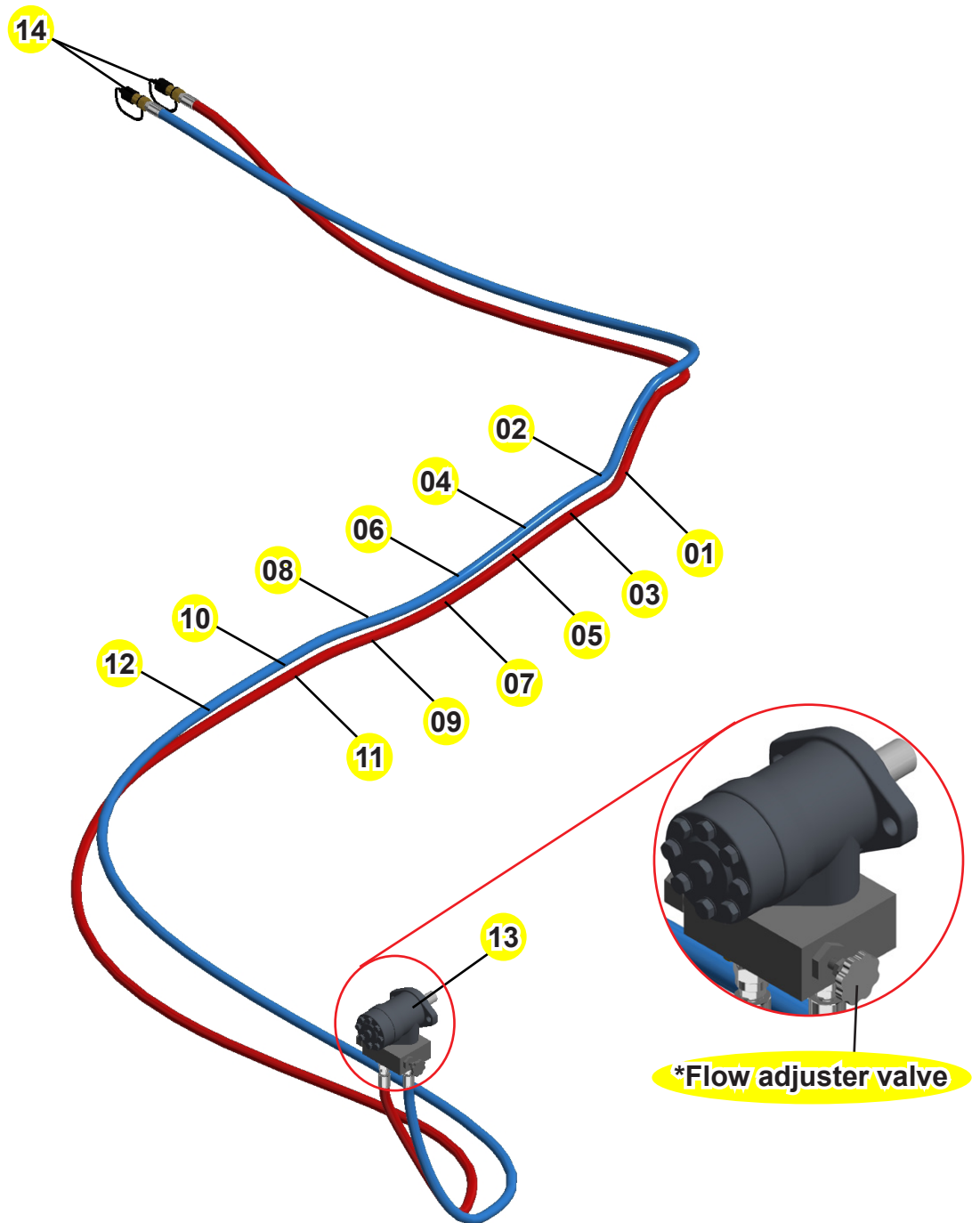
The seed hopper leaves the factory semi-assembled with the seed row unit configurations as requested by the owner.

Being the frame (A) supported safely, assemble the hopper (B) to the frame (A) using bolts (C), spring washers and nuts.



Optional

Fine seeds hopper hydraulic circuit assembly



NOTE

* • The function of the flow adjuster valve is to adjust the fluid drop rate, thus increasing or decreasing the motor speed.

IMPORTANT

• Frequently observe the general condition of connectors, hoses and cylinders to assure that there are no defects, wears or leakings.

Optional

Fine seeds hopper hydraulic circuit assembly

EST/MATIC 300														
Item	Description	Quantity												
		09 S	11 S	13 S	15 S	17 S	19 S	21 S	23 S	Pressure	Return	Pressure	Return	
01	1/2 X 7300 TR-TM hose	01	01	01	---	---	---	---	---	---	---	---	---	Pressure
02	1/2 X 7300 TR-TM hose	01	01	01	---	---	---	---	---	---	---	---	---	Return
03	1/2 X 7600 TR-TM hose	---	---	---	01	---	---	---	---	---	---	---	---	Pressure
04	1/2 X 7600 TR-TM hose	---	---	---	01	---	---	---	---	---	---	---	---	Return
05	1/2 X 8700 TR-TM hose	---	---	---	---	01	---	---	---	---	---	---	---	Pressure
06	1/2 X 8700 TR-TM hose	---	---	---	---	01	---	---	---	---	---	---	---	Return
07	1/2 X 8200 TR-TM hose	---	---	---	---	---	---	01	---	---	---	---	---	Pressure
08	1/2 X 8200 TR-TM hose	---	---	---	---	---	---	01	---	---	---	---	---	Return
09	1/2 X 9300 TR-TM hose	---	---	---	---	---	---	---	---	01	---	---	---	Pressure
10	1/2 X 9300 TR-TM hose	---	---	---	---	---	---	---	---	01	---	---	---	Return
11	1/2 X 9600 TR-TM hose	---	---	---	---	---	---	---	---	---	---	01	---	Pressure
12	1/2 X 9600 TR-TM hose	---	---	---	---	---	---	---	---	---	---	---	01	Return
13	Hydraulic motor ORB 1" axle with valve	01												
14	Male quick coupler	02												

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

Maintenance

Lubrication

To reduce the wear caused by the friction between the moving parts of the equipment, carry out a proper maintenance as indicated below:

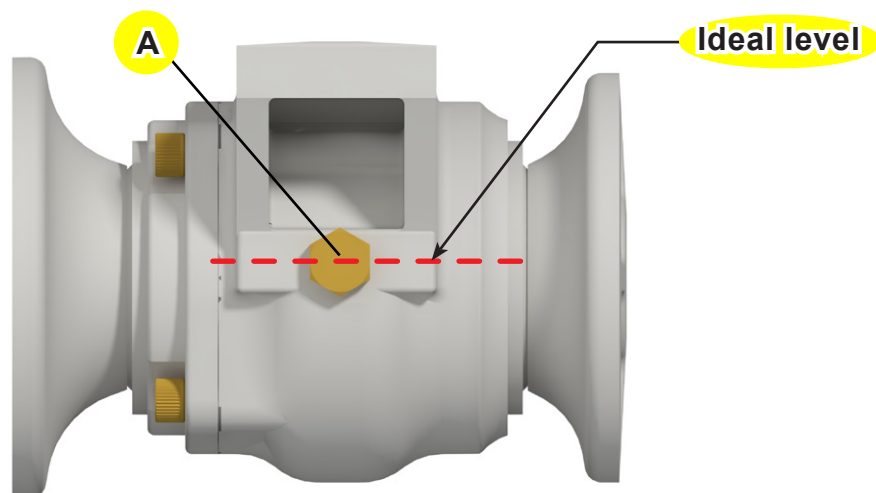
1) Every 24 service hours, lubricate the articulations through the grease fittings in the following way:

- Be certified about the lubricant quality, regarding its efficiency and purity, avoiding the use of products contaminated by water, dirt and others.
- Remove the remainder old grease around the articulations.
- Clean all the grease fittings with a cloth before introducing the lubricant and replace the defective ones.
- Introduce an enough amount of new grease.
- Use medium consistency grease.

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

2.1) The regreasable roller bearings work in constant lubrication, but it is still necessary to pay attention to these points:

- Check the oil level of each bearing on a flat place before using the equipment for the first time and every day of the first week.
- Then, verify weekly.
- Change all the oil of the bearing every 1,000 hours of service.
- Use SAE 90 mineral oil only.

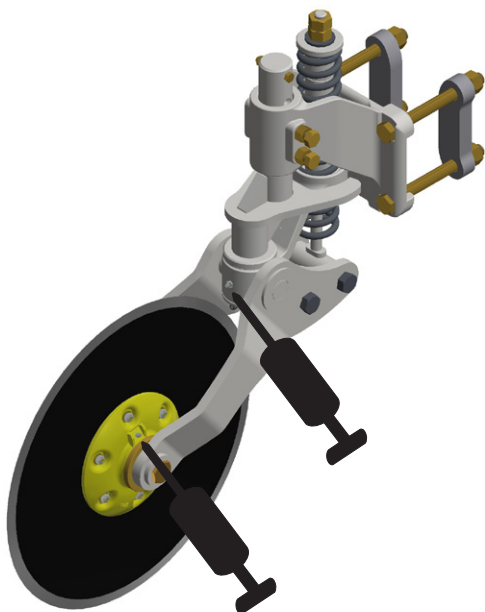
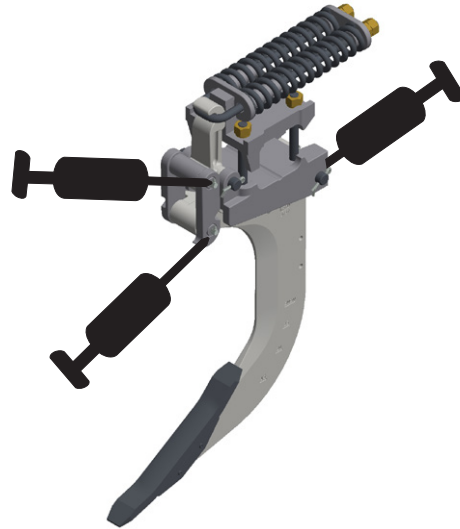
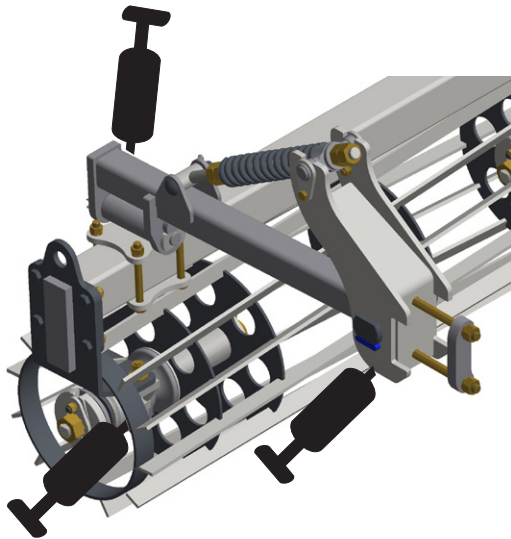


NOTE • The ideal level is when the oil reaches the hole of the plug (A), being the equipment on a flat place.

- Before assembling or disassembling the cage roller axles, it is necessary to apply grease on them.
- The oil volume on the DM bearings is 110 ml.

Maintenance

Lubrication points

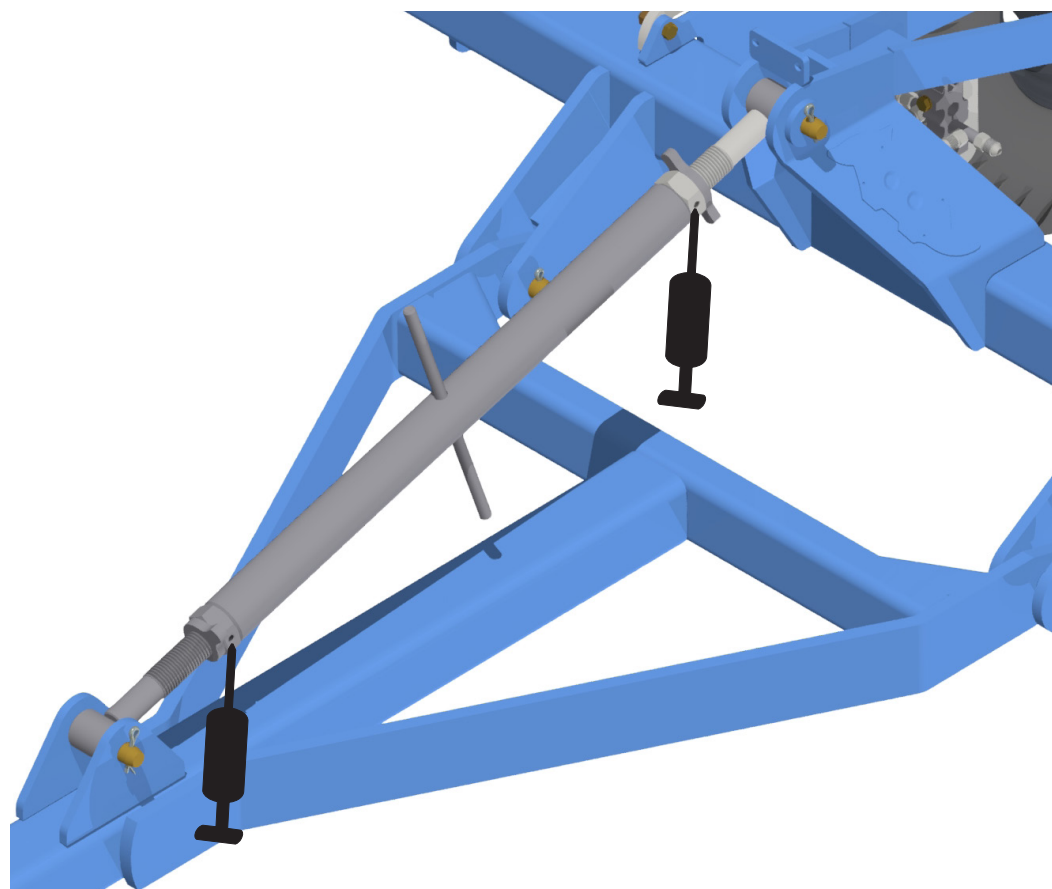


ATTENTION

- Lubricate the points shown above and all grease fittings as well.
- Carefully observe the lubrication intervals on the different points of the equipment.

Maintenance

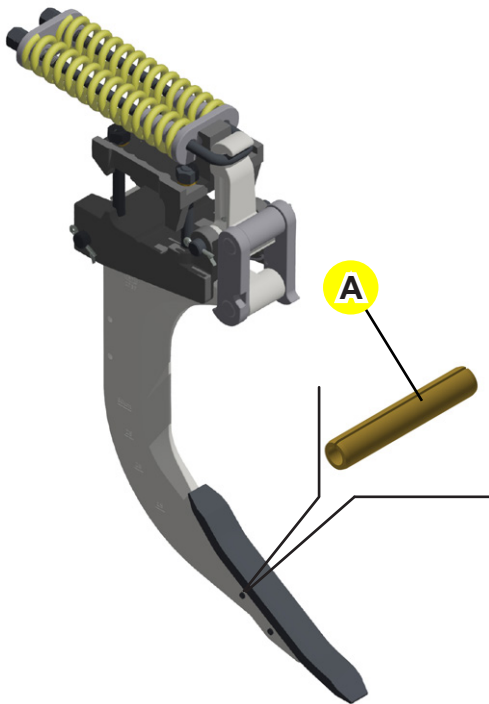
Lubrication points



ATTENTION • Lubricate the points shown above and all grease fittings as well.

Maintenance

Reversion or replacement of the tips



When the shank tips are showing a great wear and struggling to penetrate the soil, revert or replace them.

To do so, loosen up the elastic pins (A) from the shank tip.

Equipment maintenance

Switch off the tractor completely, brake and use the chocks in the tires. Immobilize the equipment firmly before making any maintenance.

Do not make any repairs in the hydraulic system while it is pressurized or the cylinders are under load. A serious accident could result of this unsafe act.

During offseason wash the plow, repair the damaged painting, protect the disc blades with oil, lubricate all grease fittings and store the plow in a covered and dry location, avoiding contact with the soil.

The shanks and discs must be replaced as soon as a low income is noticed, characterized mainly by a cut loss and other forms of damage that may occur during the job.

After some hours of operation, the bolts on the equipment 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 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.

NOTE • Use TATU original parts only.

Maintenance

Wheelset hubs lubrication

The wheelset hubs must be lubricated every 150 hours. When there is any clearance, it is necessary to give maintenance to the wheelset hubs.

Disassemble the hubs and remove the inner components. Clean all parts with diesel oil or kerosene.

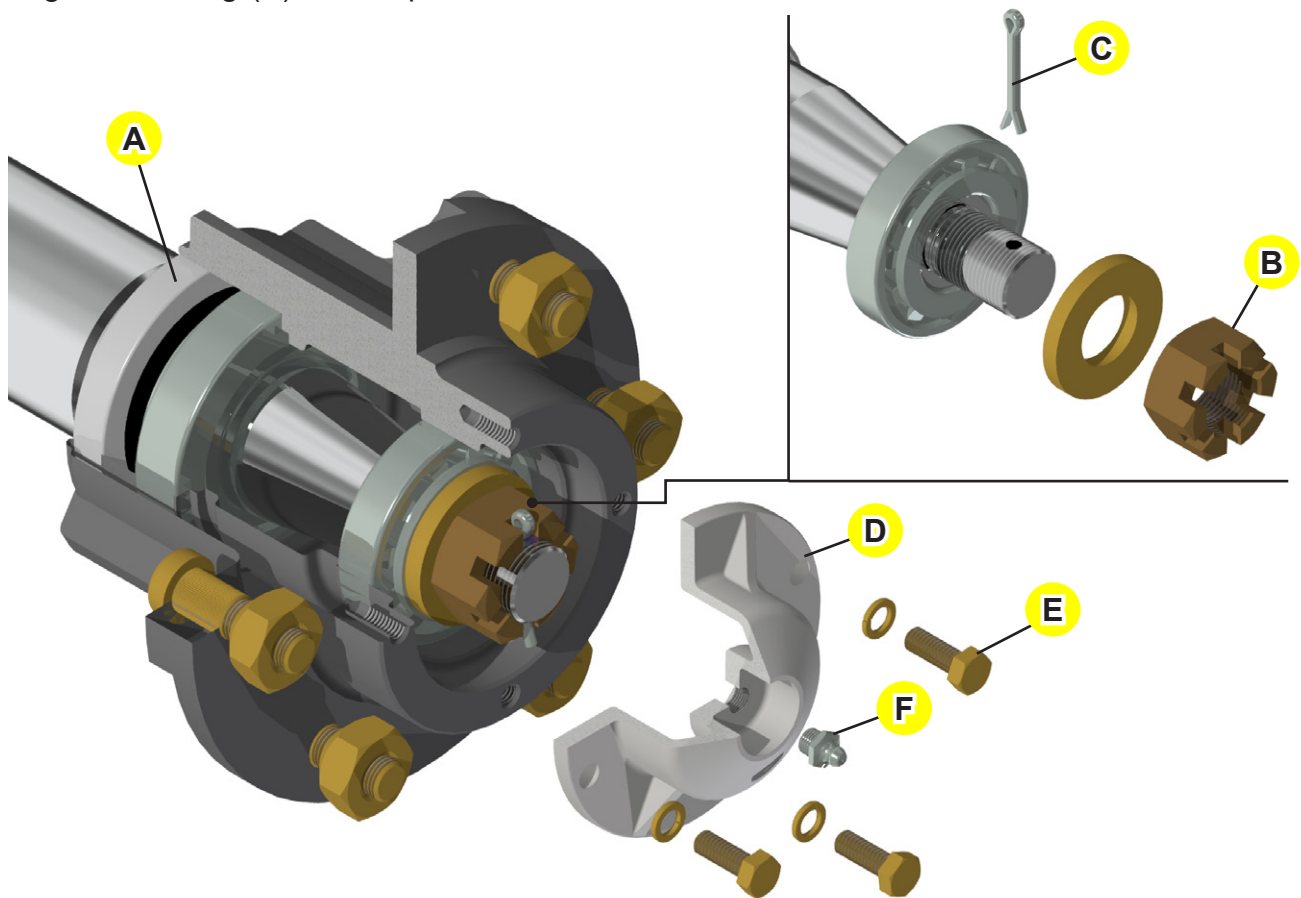
Check the existence of clearances and the condition of the bearings and retainers. Replace any damaged component or with excessive wear.

The bearing must be replaced in a preventive way to avoid breaking it and the unavailability of the equipment, as well as a higher cost for repairing it, because when the bearing breaks during working, more parts of the set gets damaged.

Check the retainer (A) position to allow that the excess of grease gets out and be careful to not damage it.

Adjust the castle nut (B) from the hub using a wrench until reaching a small resistance while turning the hub. Do not overtight. Lock using a cotter pin (C).

Place the protective cover (D) and lock using a bolt (E) and spring washer. Fasten the grease fitting (F) on the protective cover.



Whenever the retainer is damaged, replace it immediately.

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

Maintenance

Hydraulic cylinder maintenance

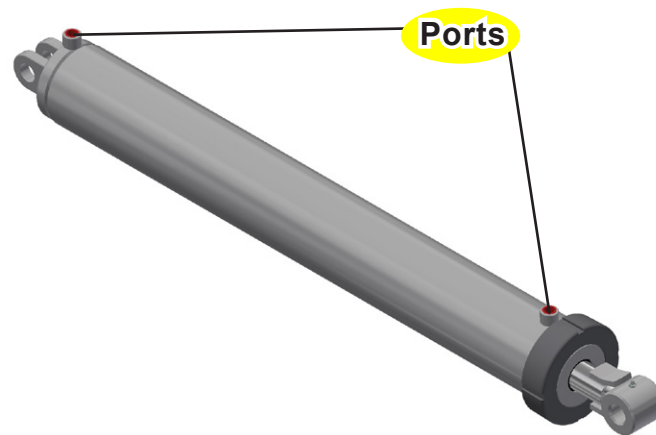
When cylinder repair is required, clean off unit, disconnect hoses and plug ports before removing cylinder.

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.

General application

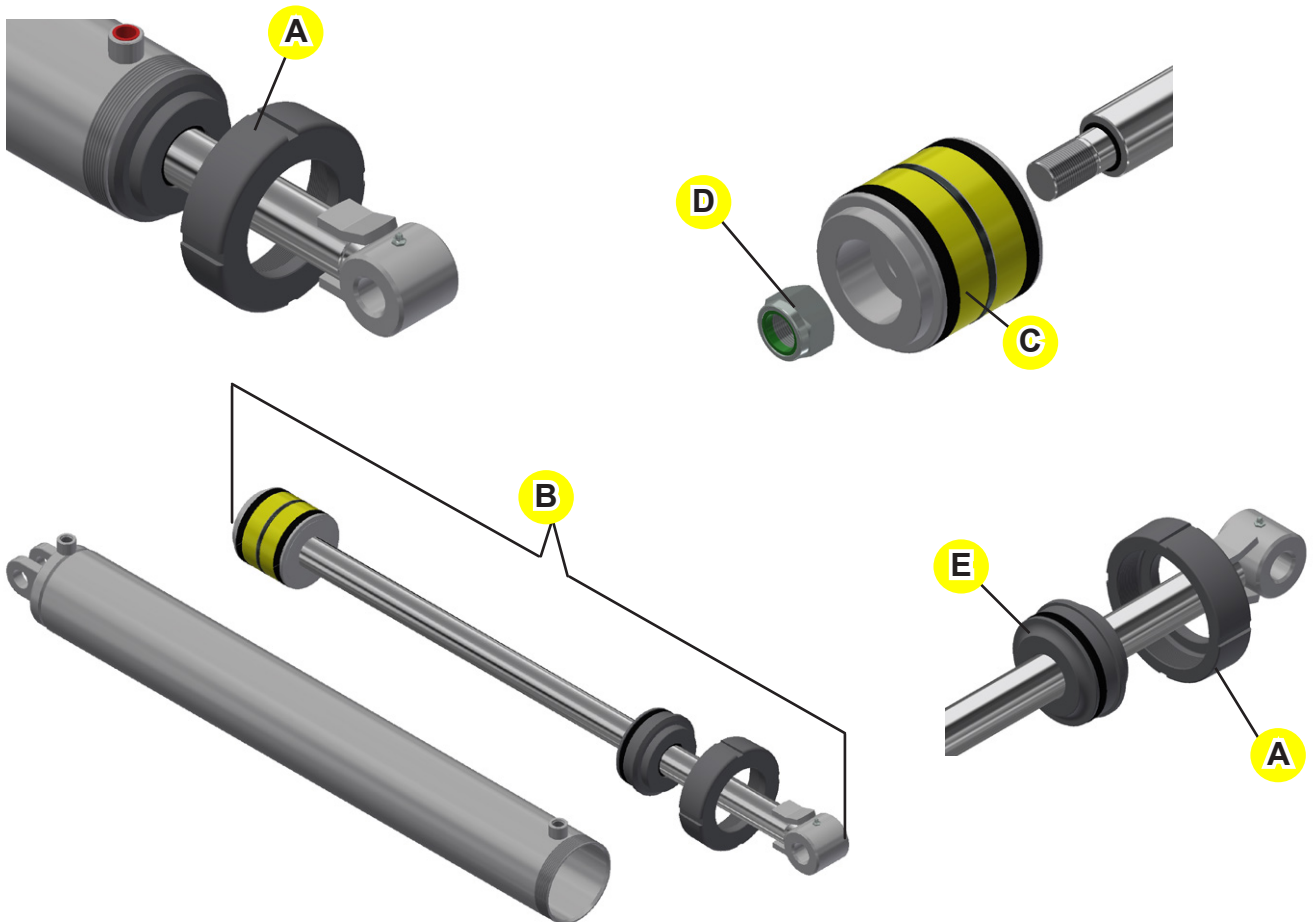
Hydraulic cylinder assembly

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 "general application" 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.

General application

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.

7.50 x 16 tire - 12 ply (72 PSI)



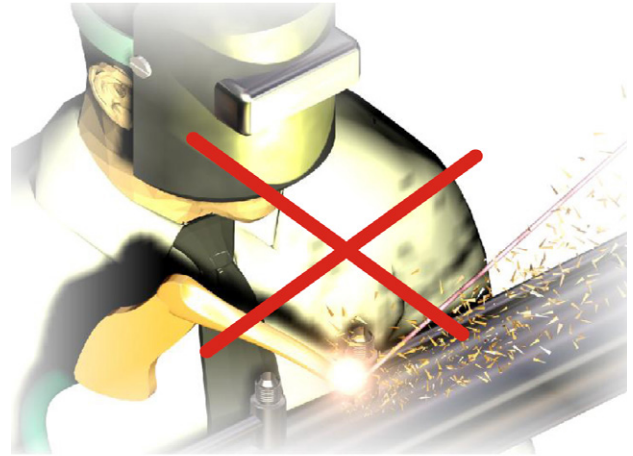
NOTE • For the cases when the maximum pressure is not specified on the tires, consult the tire manufacturer and adopt the pressure indicated by them.

General application

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.

Important data

Calculation of hourly income

To calculate the plow income, use the following calculation:

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

R = Hourly income;

L = Plow working width (meters);

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

E = Efficiency: 0.90;

X = Hectare value = 10,000 m².

Example with an EST MATIC 300 (21 shanks):

$$R = ?$$

$$L = 6.30 \text{ m}$$

$$V = 5,000 \text{ m/h}$$

$$E = 0.90$$

$$X = 10,000 \text{ m}^2$$

$$R = \frac{6.30 \times 5,000 \times 0.90}{10,000}$$

R = 2.84 hectares per hour.

NOTE

• The effective cutting width corresponds to the distance between the end shanks summed up with a spacing. Thus, the distance between two passes is being considered.

Important data

Income table

Model	Number of shanks	Cutting width (m)	Hourly income (ha)	Daily income (ha)
EST/MATIC 300	09	2.7	1.22	10.94
	11	3.3	1.49	13.37
	13	3.9	1.76	15.80
	15	4.5	2.03	18.23
	17	5.1	2.30	20.66
	19	5.7	2.57	23.09
	21	6.3	2.84	25.52
	23	6.9	3.11	27.96

NOTE • To elaborate the table above, an average speed of 5 km/h and efficiency of 90% (ninety percent) were considered.

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

Example: An area of 100 hectares to be worked with an EST/MATIC 300 with 21 shanks (Hourly income = 2.84 hectares).








$$\text{So: } \frac{100}{2.84} = 35.2$$

- Approximately will be spent 35 (thirty-five) hours to work 100 hectares.

Important data

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.

 MARCHESAN		TORQUE TABLE						<i>CIVEMASA</i>					
Bolt Size (Inches) (a)	 Grade 2		 Grade 5		 Grade 8		Bolt Size (Metric) (D)	 4.6		 8.8		 10.9	
	Lbs-ft (b)	N.m (c)	Lbs-ft	N.m	Lbs-ft	N.m		Lbs-ft	N.m	Lbs-ft	N.m	Lbs-ft	N.m
1/4" - 20	5,5	7,5	8,5	11,5	12	16,3	M5 x 0.8	2,5	3,39	5	6,78	8,5	11,526
1/4" - 28	6	8,1	9,5	12,9	14	19,0	M 6 x 1	3	4,068	8	10,85	11,5	15,594
5/16" - 18	10,5	14,2	17,5	23,7	24,5	33,2	M 6 x 0.75	3,5	4,746	8,5	11,53	13	17,628
5/16" - 24	12	16,3	19,5	26,4	27,5	37,3	M 8 x 1.25	7	9,492	19,5	26,44	28	37,968
3/8" - 16	19,5	26,4	31,5	42,7	44	59,7	M 8 x 1	8	10,848	21	28,48	30,5	41,358
3/8" - 24	22	29,8	35	47,5	50	67,8	M 10 x 1.5	14	18,984	38,5	52,21	56	75,936
7/16" - 14	31	42,0	50	67,8	70,5	95,6	M 10 x 1	16	21,696	43	58,31	63	85,428
7/16" - 14	34,5	46,8	56	75,9	79	107,1	M 12 x 1.75	25	33,9	66,5	90,17	98	132,888
1/2" - 13	47	63,7	76	103,1	107,5	145,8	M 12 x 1.25	27	36,612	73	98,99	107,5	145,77
1/2" - 20	53,5	72,5	86	116,6	121,5	164,8	M 14 x 2	40	54,24	107	145,09	156,5	212,214
9/16" - 12	68	92,2	110	149,2	155	210,2	M 14 x 1.5	43	58,308	115,5	156,62	169	229,164
9/16" - 18	76	103,1	122,5	166,1	173	234,6	M 16 x 2	62	84,072	165,5	224,42	243,5	330,186
5/8" - 11	94	127,5	151,5	205,4	214,5	290,9	M 16 x 1.5	66,5	90,174	177	240,01	260	352,56
5/8" - 18	106,5	144,4	171,5	232,6	242,5	328,8	M 18 x 2.5	86	116,616	229	310,52	336	455,616
3/4" - 10	167	226,5	269,5	365,4	380,5	516,0	M 18 x 1.5	96,5	130,854	257	348,49	378	512,568
3/4" - 16	186	252,2	300	406,8	424,5	575,6	M 20 x 2.5	121,5	164,754	323,5	438,67	475	644,1
7/8" - 9	169,5	229,8	434	588,5	612,5	830,6	M 20 x 1.5	134,5	182,382	359	486,80	527	714,612
7/8" - 14	187	253,6	478,5	648,8	676,5	917,3	M 22 x 2.5	165,5	224,418	441	598,00	647,5	878,01
1" - 8	254,5	345,1	650	881,4	918,5	1.245,5	M 22 x 1.5	182	246,792	484	656,30	711,5	964,794
1" - 12	285,5	387,1	729,5	989,2	1031	1.398,0	M 24 x 3	210	284,76	559	758,00	821	1113,276
1.1/8" - 7	360,5	488,8	921,5	1.249,6	1302	1.765,5	M 24 x 1.5	238,5	323,406	636	862,42	933,5	1265,826
1.1/8" - 12	404,5	548,5	1033,5	1.401,4	1460	1.979,8	M 27 x 3	307	416,292	820	1111,92	1204	1632,624
1.1/4" - 7	508,5	689,5	1300	1.762,8	1837,5	2.491,7	M 27 x 1.5	344	466,464	918	1244,81	1348,5	1828,566
1.1/4" - 12	563,5	764,1	1439,5	1.952,0	2034,5	2.758,8	M 30 x 3.5	416,5	564,774	1111,5	1507,19	1632,5	2213,67
1.3/8" - 6	667	904,5	1704,5	2.311,3	2408	3.265,2	M 30 x 1.5	477,5	647,49	1273	1726,19	1870	2535,72
1.3/8" - 12	759,5	1.029,9	1940	2.630,6	2741,5	3.717,5	M 33 x 3.5	567	768,852	1512,5	2050,95	2221,5	3012,354
1.1/2" - 6	885,5	1.200,7	2262,5	3.068,0	3197	4.335,1	M 33 x 1.5	641,5	869,874	1709,5	2318,08	2511	3404,916
1.1/2" - 12	996	1.350,6	2545,5	3.451,7	3597	4.877,5	M 36 x 4	729	988,524	1943	2634,71	2854	3870,024
a) Nominal thread diameter in inches-threads per inch b) Foot pounds c) Newton-meters d) Nominal thread diameter in millimeters x thread pitch							M 36 x 1.5	838,5	1137,006	2236	3032,02	3284	4453,104
							M 39 x 4	943	1278,708	2515	3410,34	3693,5	5008,386
							M 39 x 1.5	1073	1454,988	2860,5	3878,84	4201,5	5697,234

Values are for reference and are based on average steel-to-steel friction conditions.

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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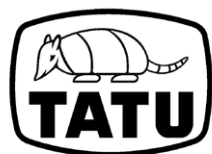
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MARCHESAN

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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 toxicidade 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.

ATENCIÓN

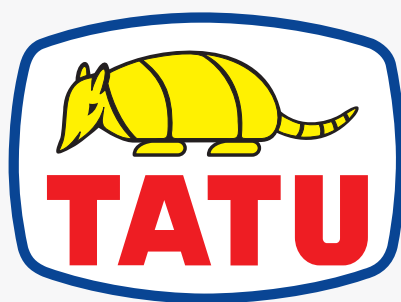
- RECOMENDACIONES GENERALES DE SEGURIDAD -

- 1 - Solamente personas con el completo conocimiento del tractor y de los implementos deben conducirlos.
- 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 a la toxicidad de los gases expelidos.
- 5 - Proceda con los lastres necesarios para traccionar equipos que así 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 móviles 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 rociadoras (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 presión antes de desconectar cualquier tubería.
- 16 - No verifiquen filtraciones en los circuitos hidráulicos con las manos, la alta presión puede provocar lesiones corporales, use cartón u otro objeto adecuado.
- 17 - Después del término 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 órganos activos afilados, con bordes cortantes que ofrecen riesgos de accidentes, aún cuando detenidos; por lo tanto, estos deben ser mantenidos en local apropiado, 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 tractor's 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 order 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 tractor's parking brake and remove the key.



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