ATCR / ATCRL
GAICR / GAICR 300

OPERATOR'S MANUAL

TATU
MARCHESAN

IDENTIFICATION

Dealer: _____

Owner: _____

Firm / Farm: _____

City: _____ State: _____

No. of the Certificate of Guarantee: _____

Serial / No.: _____

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

Product: _____

Notes: _____

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Introduction

The ATCR, ATCRL, GAICR and GAICR 300 disk harrows were designed to work in any type of soil and they provide an excellent seedbed preparation for annual and perennial crops.

The rugged structure has an adequate size and is made of folded steel plates, joined by a good weld penetration and fine finishing, with resistant parts on the force concentration.

These disk harrows have an efficient wheel system composed by tires and hydraulic cylinders, which allow the transportation over long distances.

This operator's manual contains the necessary information for the best performance of these equipments. The operator must carefully read the entire manual before working with the equipment. Also, read and understand the safety recommendations.

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

TATU
MARCHESAN

Table of contents

To the owner

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

• Warranty certificate;

• Operator's manual;

• Technical assistance by the dealer on equipment delivery.

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

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

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

This manual should be read by operators and maintenance staff.

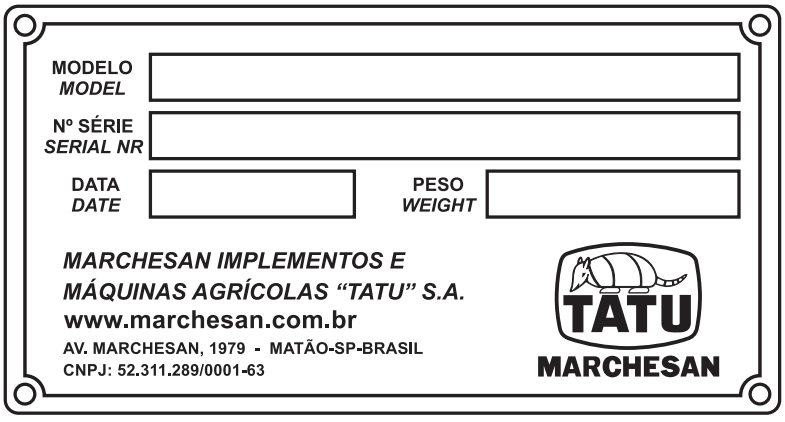
Important

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

General information

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

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



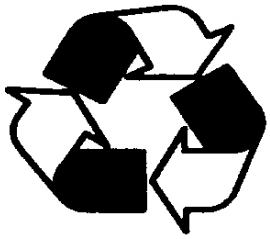
NOTE **The warranty shall not be applied to any equipment or any part thereof which has been altered elsewhere than at the place of manufacture or which the original purchaser thereof at retail has used or allowed to be used parts, not made or supplied by Marchesan.**

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 can be spilt over to the soil and 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, mechanician or third parties, therefore they should be carefully read and observed. When the safety instructions are not being followed, a serious accident or even death may occur.**

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 harrowing, transportation, maintenance and storage.

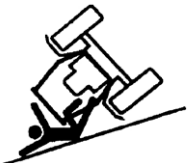
Read and understand the information before making any adjustment or maintenance.

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

To the operator

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

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



Be careful while driving on slopes. Risk of overturn.

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

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

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

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

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

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

Always use the safety locks to carry out any maintenance or to transport the equipment.

To the operator

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

Transportation over truck or trailer

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

- Use adequate ramps to load or unload the equipment. Do not make the loading on ditch banks, it can cause a serious accident.

- When lifting with a hoist, use the appropriate points to lift.

- Underpin the equipment appropriately.

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

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

- After 8 to 10 km transporting, please inspect the load condition. Repeat this procedure every 80 to 100 km. Give more attention when transporting the equipment on rough roads, slopes and other adverse conditions.

- Always be careful with the load height, especially when passing under electrical power lines, bridges and others.

- Check all laws and regulations regarding the height limits and load width while transporting the equipment on truck or trailer. If necessary use banners, lights and other devices in order to give adequate warning to the other drivers.

Working safety standards

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

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

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

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

Regulatory Standard - **NR 06**:

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

Regulatory Standard - **NR 12**:

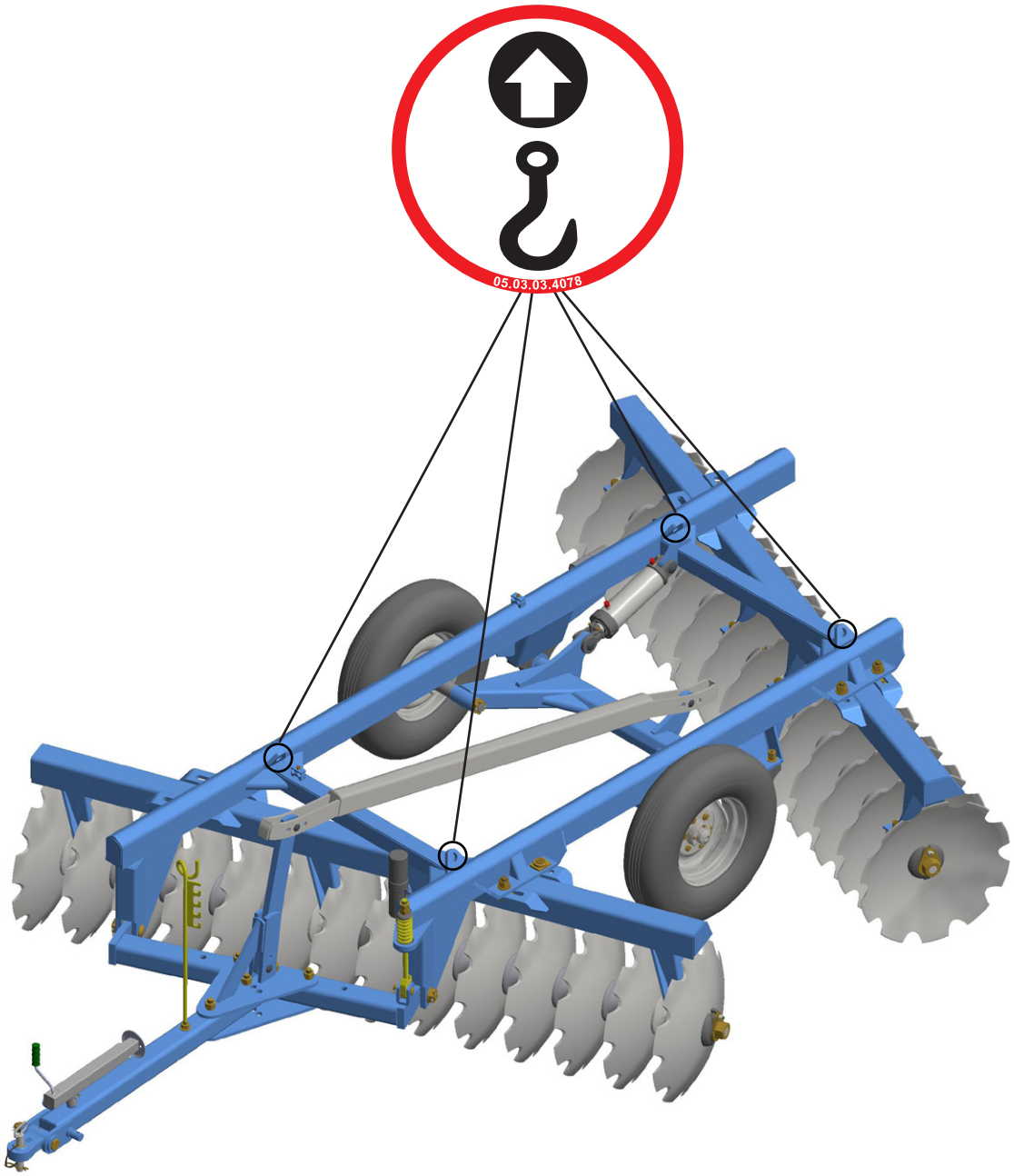
• This Regulatory Standard and its annexes provide technical references, basic principles and protective measures to ensure the health and physical integrity of workers and establishes minimum requirements for the prevention of accidents and occupational diseases in the design stages and use of machinery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

Regulatory Standard - **NR 31**:

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

Lifting points

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



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

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

Always keep a safe distance from the equipment.

Safety decals

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

ADVERTÊNCIA / WARNING / ADVERTENCIA

Para evitar acidentes, instale as travas dos cilindros antes do transporte ou antes de efetuar serviços no equipamento.

In order to avoid accidents activate cylinder locks before transportation or carrying out any service on the equipment.

Para evitar accidentes, instale las trabas de los cilindros antes del transporte o antes de efectuar trabajos en el equipo.

05.03.03.1738

ADVERTÊNCIA / WARNING / ADVERTENCIA

Para transportar a grade, retire os cabeçalhos e coloque-os sobre a mesma. Retire as travas dos chassis e deixe-os unidos, apenas a través da barra de tração, para que possam se movimentar durante o transporte sem sofrer danos (consulte o manual).

Remove both drawbars and place them over the harrow before transporting it. Also remove both frame lockers keeping them joined by the traction bar, so they can move during transportation and suffer no damage. (For more information, check the manual).

Para transportar la rastra, retire las cabeceras y coloque sobre la misma. Retire las trabas de los chasis y déjelos unidos, solamente a través de la barra de tracción, para que puedan moverse durante el transporte sin sufrir daños (consulte el manual).

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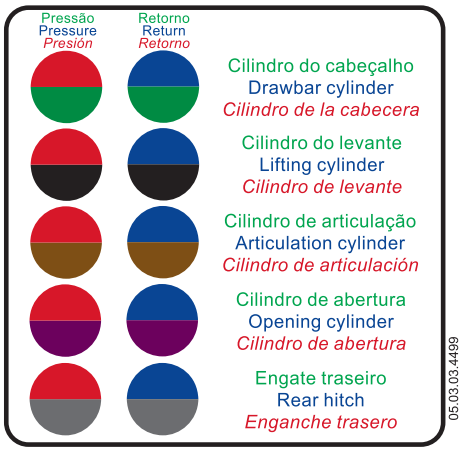

PERIGO / DANGER / PELIGRO

Para evitar acidentes, não faça regulagens com o equipamento em movimento. Para manutenção e limpeza, desligue o motor do trator.

In order to avoid accidents, do not carry out adjustments with the equipment in movement. For maintenance and cleaning, switch off the tractor engine.

Para evitar accidentes, no haga reglajes con el equipo en movimiento. Para mantenimiento y limpieza, apague el motor del tractor.

05.03.03.1739

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.

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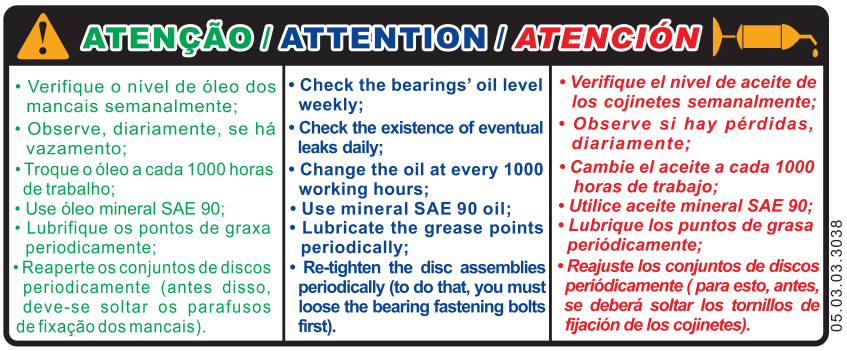
Safety decals



Safety decals

Qty.	Model	Serial number
1	ATCR decal	**05.03.06.0786**
1	ATCRL decal	**05.03.06.1529**
1	GAICR decal	**05.03.06.0787**
1	GAICR 300 decal	**05.03.06.0824**
1	Warning decal	**05.03.03.1738**
4	Lifting points decal	**05.03.03.4078**
1	Disk harrow transportation decal	**05.03.03.4509**
1	Grip coupler colors decal	**05.03.03.4499**
1	Danger decal	**05.03.03.1739**
1	Read the manual decal	**05.03.03.1428**
1	Opening / closing the disc gangs decal	**05.03.03.4438**
1	Attention decal	**05.03.03.3038**
1	Lubricate and tighten daily decal	**05.03.03.1827**

Data sheet

Type: ..... Wheel type offset disk harrow
Model: ..... ATCR
Disc blades: ..... 12,14, 16, 18, 20, 22, 23, 24, 25, 26, 28, 29, 32, 36, 40 & 44
Spacing between disc blades: ..... 230 mm
Disc blades dimension: ..... Ø 24" x 6 mm, Ø 26" x 6 mm
..... Ø 28" x 6 mm, Ø 28" x 7.5 mm
Disc blade type: ..... Concave notched
Bearings - length: ..... 225 mm
- type: ..... Grease/oil bath bearing or steel-plated bearing
Spacer spools - length: ..... 225 mm
- type: ..... Iron cast
Axle diameter: ..... Ø 41 mm (1.5/8")
Hitching type: ..... Drawbar
Working speed: ..... 5 to 7 km/h
Transport speed: ..... 30 km/h
Tires: ..... Check the 'tires inflation' page

Model	Number of disc blades	Cutting width (mm)	Weight (kg)	Tractor required power (cv)
ATCR	12	1270	1498	70 - 75
	14	1500	1681	75 - 80
	16	1730	1804	80 - 90
	18	1960	1951	95 - 100
	20	2190	2043	105 - 120
	22	2420	2195	125 - 135
	23	2530	1999	135 - 140
	24	2650	2309	140 - 150
	25	2760	2350	150 - 160
	26	2880	2488	160 - 170
	28	3110	2559	170 - 180
	29	3220	2125	180 - 190
	32	3570	3436	180 - 190
	36	4030	3664	200 - 220
	40	4490	4033	230 - 240
	44	4950	4378	240 - 260

NOTE **The weights above were quoted using Ø 26'' disc blades.**

Data sheet

Type: ..... Wheel type offset disk harrow
Model: ..... ATCRL
Disc blades: ..... 14, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 32, 33, 36 & 37
Spacing between disc blades: ..... 230 mm
Disc blades dimension: ..... Ø 24" x 7.5 mm, Ø 26" x 4.75 mm
..... Ø 26" x 6 mm
Disc blade type: ..... Concave notched
Bearings - length: ..... 225 mm
- type: ..... Grease/oil bath bearing or steel-plated bearing
Spacer spools - length: ..... 225 mm
- type: ..... Iron cast
Axle diameter: ..... Ø 38,1 mm (1.1/2")
Hitching type: ..... Drawbar
Working speed: ..... 5 to 7 km/h
Transport speed: ..... 30 km/h
Tires: ..... Check the 'tires inflation' page

Model	Number of disc blades	Cutting width (mm)	Weight (kg)	Tractor required power (cv)
ATCRL	14	1500	1237	50 - 70
	16	1730	1314	70 - 80
	18	1960	1412	80 - 90
	19	2075	1385	
	20	2190	1556	90 - 100
	21	2305	1484	
	22	2420	1593	100 - 110
	23	2535	1662	
	24	2650	1695	110 - 120
	25	2770	1736	
	26	2890	1835	130 - 140
	28	3110	1869	
	29	3225	1937	
	32	3570	2019	150 - 160
	33	3675	2003	
	36	4030	2236	170 - 180
	37	4140	2204	

NOTE **The weights above were quoted using Ø 26'' disc blades.**

Data sheet

Type: ..... Wheel type offset disk harrow
Model: ..... GAICR
Disc blades: ..... 12,14, 16, 18, 20, 22, 24, 26, 28, 29, 30, 32, 36, 40, 44 and 48
Spacing between disc blades: ..... 270 mm
Disc blades dimension: ..... Ø 26" x 6 mm, Ø 28" x 6 mm
..... Ø 28" x 7.5 mm
Disc blade type: ..... Concave notched
Bearings - length: ..... 262 mm
- type: ..... Grease/oil bath bearing or steel-plated bearing
Spacer spools - length: ..... 262 mm
- type: ..... Iron cast
Axle diameter: ..... Ø 41 mm (1.5/8")
Hitching type: ..... Drawbar
Working speed: ..... 5 to 7 km/h
Transport speed: ..... 30 km/h
Tires: ..... Check the 'tires inflation' page

Model	Number of disc blades	Cutting width (mm)	Weight (kg)	Tractor required power (cv)
GAICR	12	1600	1689	70 - 80
	14	1750	1766	80 - 90
	16	2000	2072	100 - 110
	18	2300	2154	110 - 120
	20	2570	2382	120 - 135
	22	2840	2517	135 - 150
	24	3110	2596	150 - 165
	25	3250	2606	165 - 180
	26	3380	2706	170 - 180
	28	3650	2882	180 - 195
	29	3780	2876	195 - 210
	30	3920	2973	195 - 210
	32	4180	4117	210 - 230
	36	4720	4368	230 - 250
	40	5250	4730	250 - 270
	44	5440	5424	270 - 290
	48	6230	5652	290 - 310

NOTE **The weights above were quoted using Ø 28'' disc blades.**

Data sheet

Type: ..... Wheel type offset disk harrow

Model: ..... GAICR 300

Disc blades:..... 12, 14, 16, 18, 20, 22, 24, 26, 28 and 30

Spacing between disc blades:.....300 mm

Disc blades dimension:..... Ø 26" x 6 mm, Ø 28" x 6 mm

..... Ø 28" x 7.5 mm, Ø 30" x 7.5 mm

Disc blade type:..... Concave notched

Bearings - length: .....296 mm

- type: ..... Grease/oil bath bearing or steel-plated bearing

Spacer spools - length: .....296 mm

- type:.....Iron cast

Axle diameter: .....Ø 44,45 mm (1.3/4")

Hitching type: .....Drawbar

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

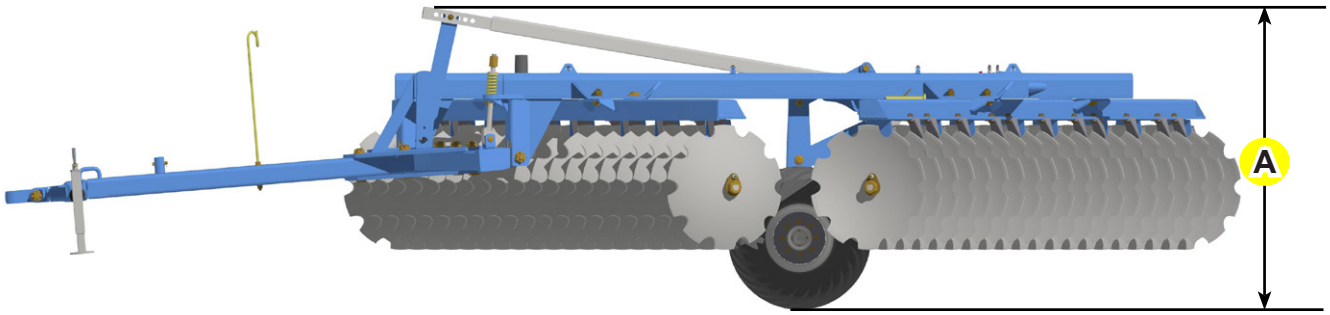
Transport speed:.....30 km/h

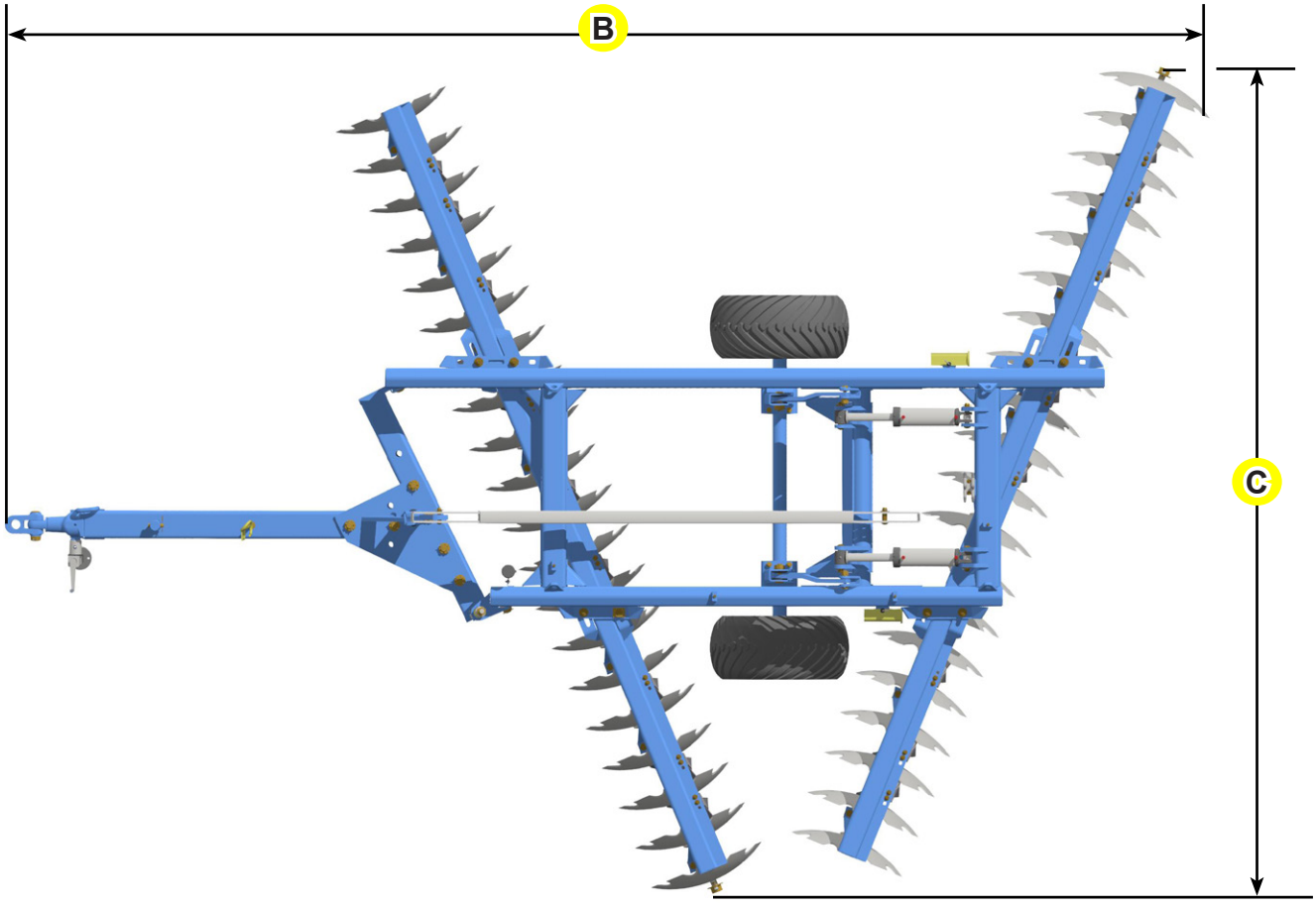
Tires:.....Check the 'tires inflation' page

Model	Number of disc blades	Cutting width (mm)	Weight (kg)	Tractor required power (cv)
GAICR 300	12	1650	1713	80 - 90
	14	1900	1567	90 - 105
	16	2185	1976	105 - 115
	18	2400	2028	115 - 125
	20	2735	2290	125 - 140
	22	3010	2402	140 - 155
	24	3280	2422	155 - 170
	26	3560	2627	170 - 185
	28	3840	3180	185 - 200
	30	4120	3416	200 - 215

NOTE **The weights above were quoted using Ø 26" disc blades.**

Dimensions for transportation and storage





Data sheet

Dimensions for transportation and storage

Models	ATCR			ATCRL			GAICR			GAICR 300		
Disc blades	A	B	C	A	B	C	A	B	C	A	B	C
12	1580	5420	1460				1580	5440	1610	1580	5460	1630
14	1580	5510	1680	1580	5510	1680	1580	5600	1860	1580	5640	1910
16	1580	5600	1900	1580	5600	1900	1580	5760	2110	1580	5820	2190
18	1580	5690	2120	1580	5690	2120	1580	5920	2360	1580	6000	2470
19				1580	5780	2230						
20	1580	5870	2340	1580	5870	2340	1580	6080	2610	1580	6180	2750
21				1580	5960	2450						
22	1580	6050	2560	1580	6050	2560	1580	6240	2860	1580	6360	3030
23	1580	6140	2670	1580	6140	2670						
24	1580	6230	2780	1580	6230	2780	1580	6400	3110	1580	6540	3310
25	1580	6320	2890	1580	6320	2890	1580	6480	3235			
26	1580	6410	3000	1580	6410	3000	1580	6560	3360	1580	6720	3590
28	1580	6590	3220	1580	6590	3220	1580	6720	3610	1580	6900	3870
29	1580	6680	3330	1580	6680	3330	1580	6800	3735			
30							1580	6880	3860	1580	7080	4150
32	1580	7220	3650	1580	7220	3650	1580	7040	4110			
33				1580	7310	3760						
36	1580	7580	4750	1580	7580	4750	1580	7360	4610			
37				1580	7670	3870						
40	1580	7940	5860				1580	7550	5110			
44	1580	8300	6135				1580	7870	5610			
48							1580	8190	6110			

NOTE Measures in millimeters.

ATCR 12 - 29 / ATCRL 14 - 37 / GAICR 12 - 30 disc blades

01 - Frame

02 - Front disc gang

03 - Rear disc gang

04 - Hydraulic cylinder

05 - Stabilizer bar

06 - Wheel support

07 - Hose support

08 - Drawbar

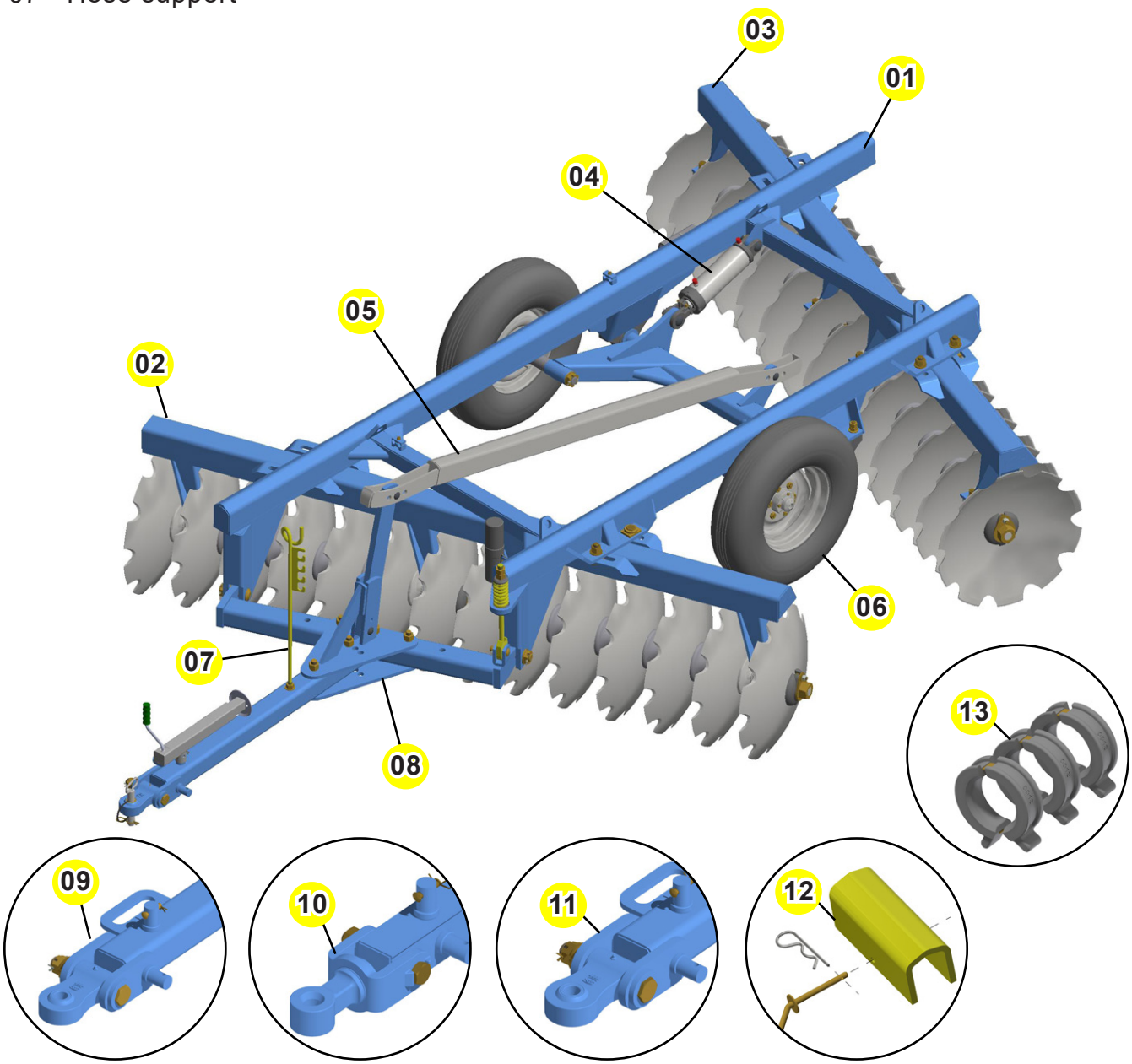
09 - Tractor hitch (ATCR 12 - 28 disc blades)

10 - Tractor hitch (ATCRL 14 - 36 / GAICR 12 and 14 disc blades)

11 - Tractor hitch (GAICR 16 - 30 disc blades)

12 - Transport lock

13 - Depth stops (optional)



Components

ATCR 32 - 44 / GAICR 32 - 40 disc blades

01 - Frame

02 - Front disc gang

03 - Rear disc gang

04 - Hydraulic cylinder

05 - Stabilizer bar

06 - Wheel support

07 - Hose support

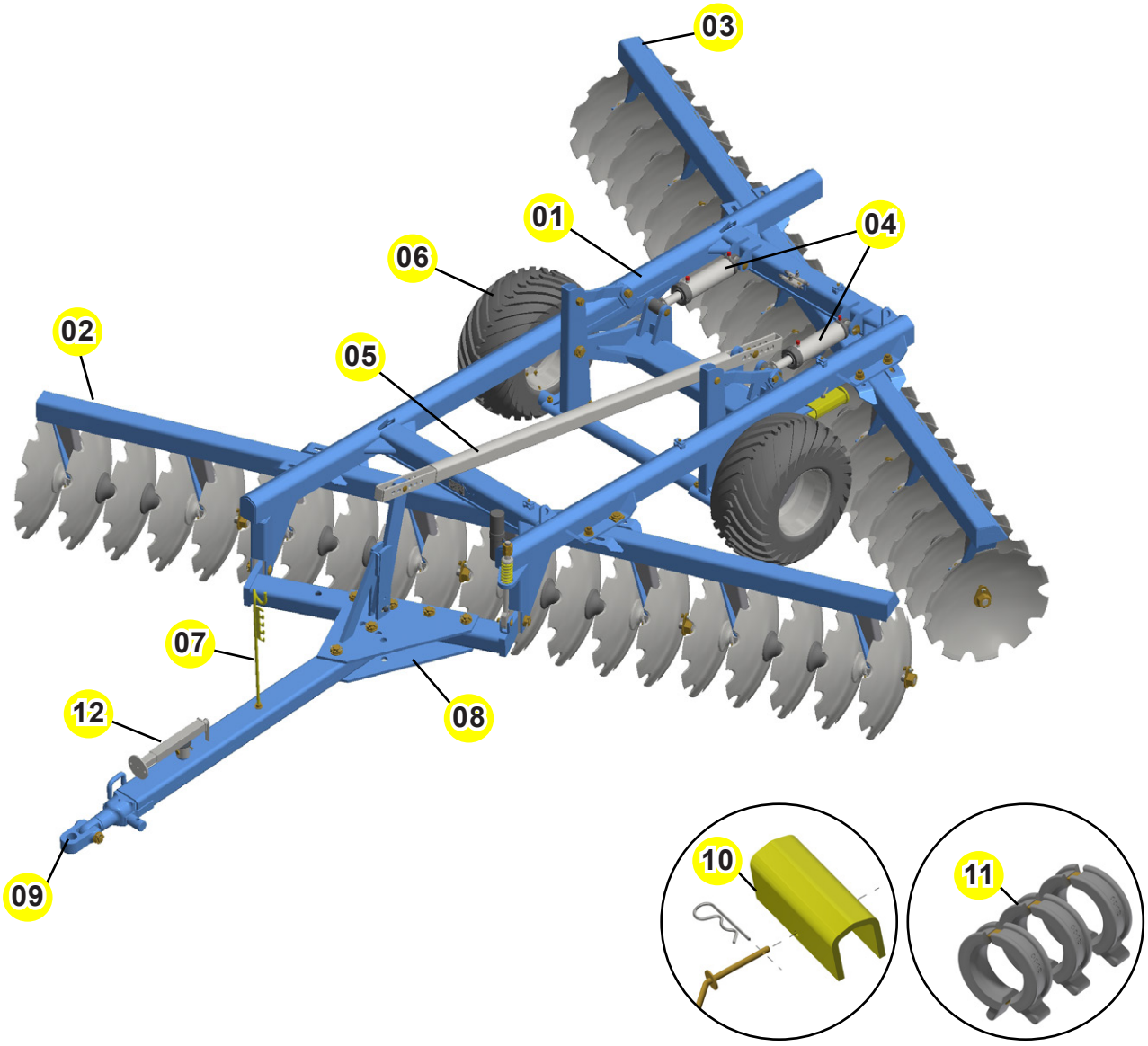
08 - Drawbar

09 - Tractor hitch

10 - Transport lock

11 - Depth stops (optional)

12 - Jack



NOTE The hitch pin is not an included part of these disk harrow models.

Components

GAICR 44 and 48 disc blades

01 - Frame

02 - Front disc gang

03 - Rear disc gang

04 - Hydraulic cylinder

05 - Wheel support

06 - Hose support

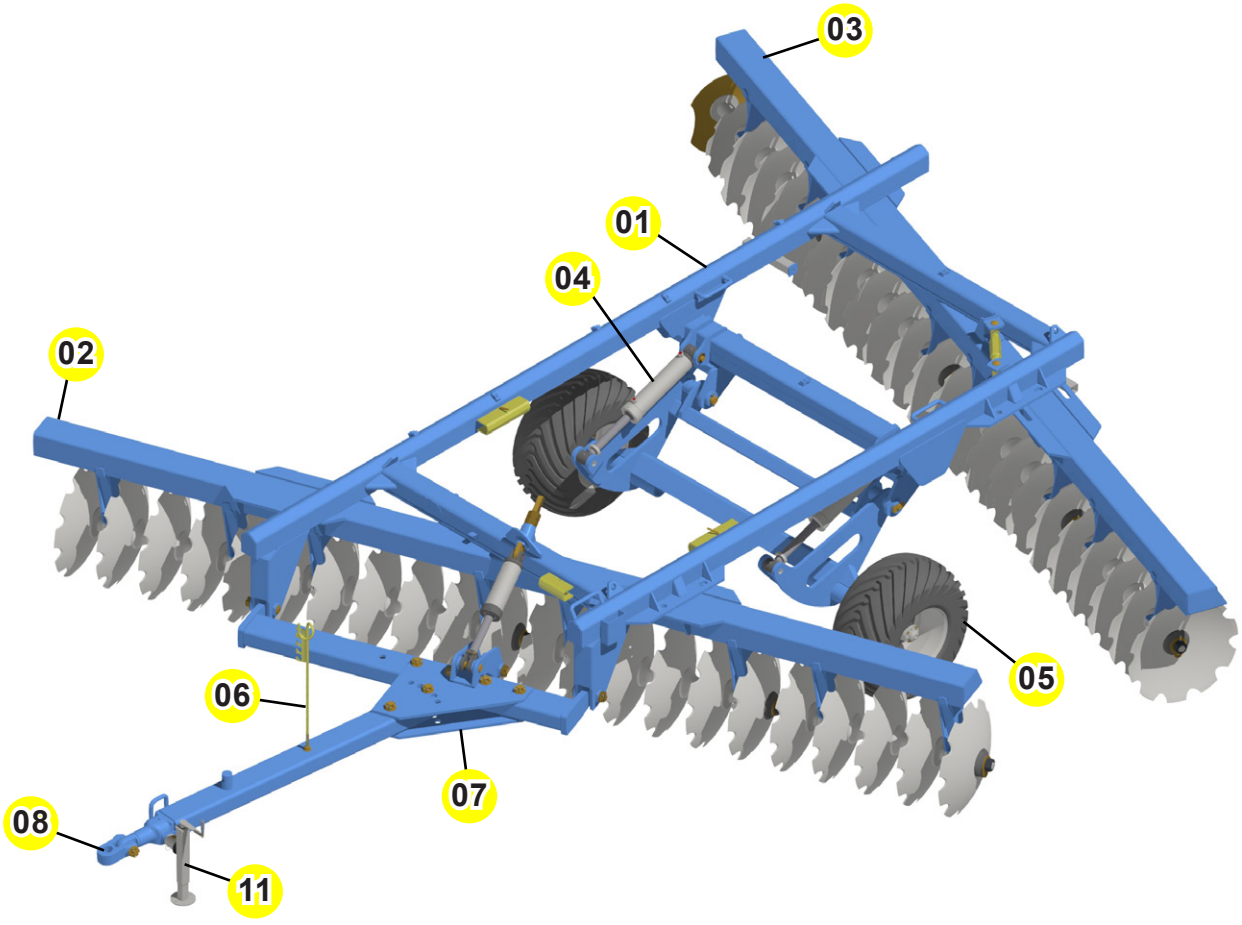
07 - Drawbar

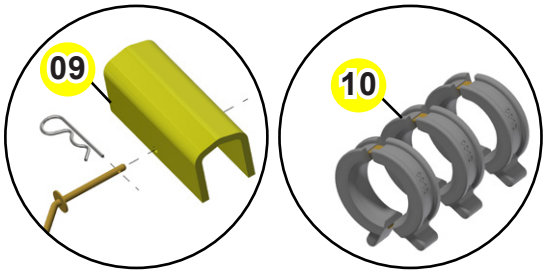
08 - Tractor hitch

09 - Transport lock

10 - Depth stops (optional)

11 - Jack





NOTE **The hitch pin is not an included part of these disk harrow models.**

Components

GAICR 300 12 - 30 disc blades

01 - Frame

02 - Front disc gang

03 - Rear disc gang

04 - Hydraulic cylinder

05 - Stabilizer bar

06 - Wheel support

07 - Hose support

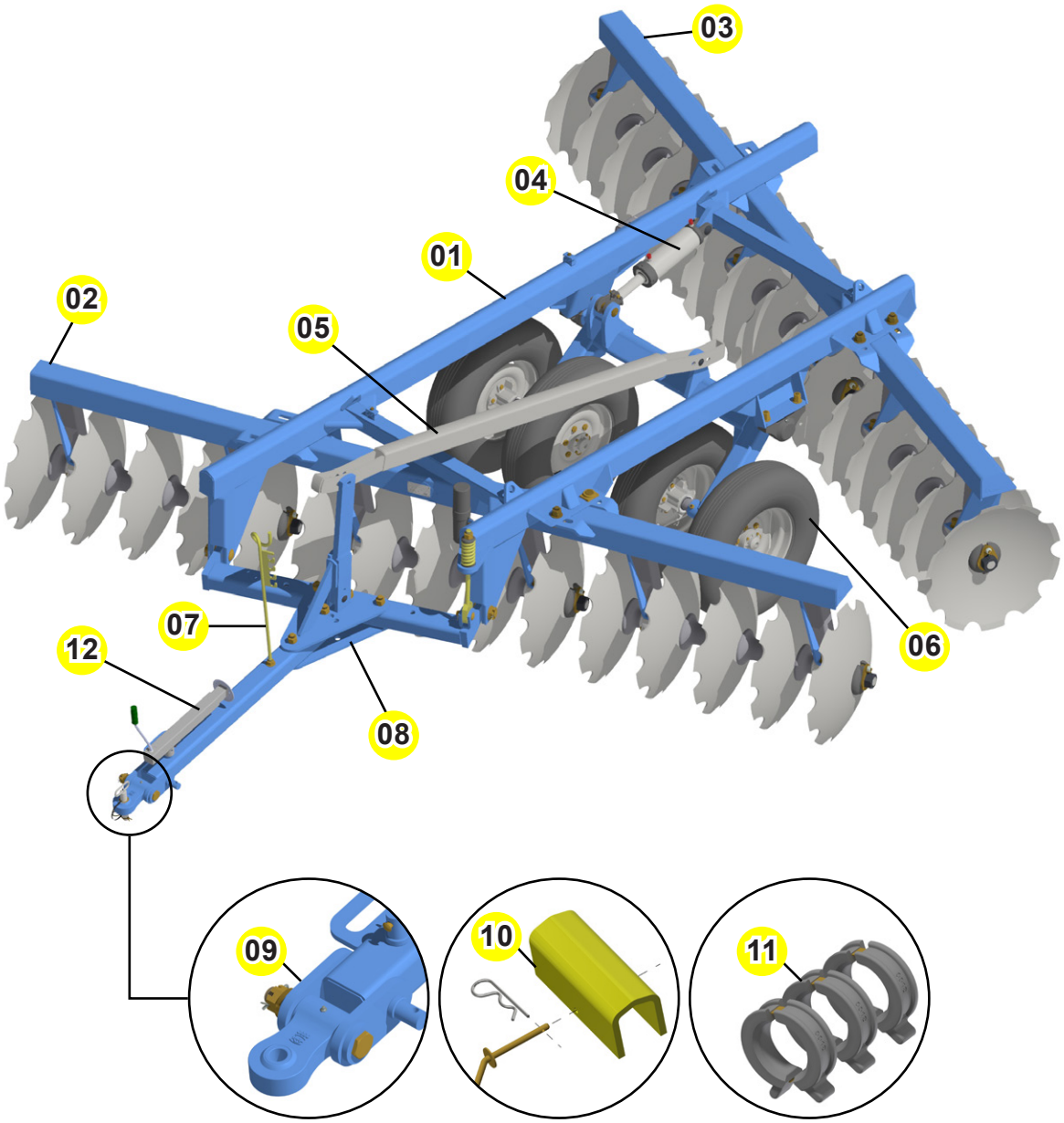
08 - Drawbar

09 - Tractor hitch

10 - Transport lock

11 - Depth stops (optional)

12 - Jack (optional)



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 gangs, one to hold the axle nut on one side while the other tight the nut to the other end, thereby preventing the axle from rotating.

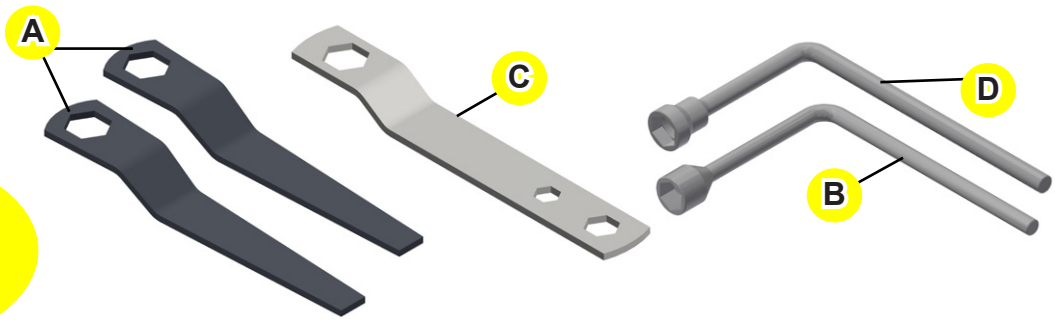
Use the L shaped socket wrench (B) to tighten the nuts of the bearing bolts.

Use the box end wrenches (C) and (C1) to tighten the nuts of the traction set.

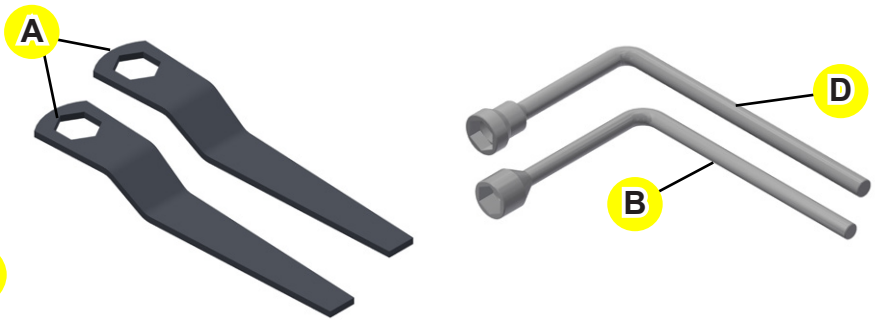
Use the L shaped socket wrench (D) to tighten the nuts on the bolts that fasten the disc gangs to the frame.

Use the adjustment wrench (E) to tighten the leveling control.

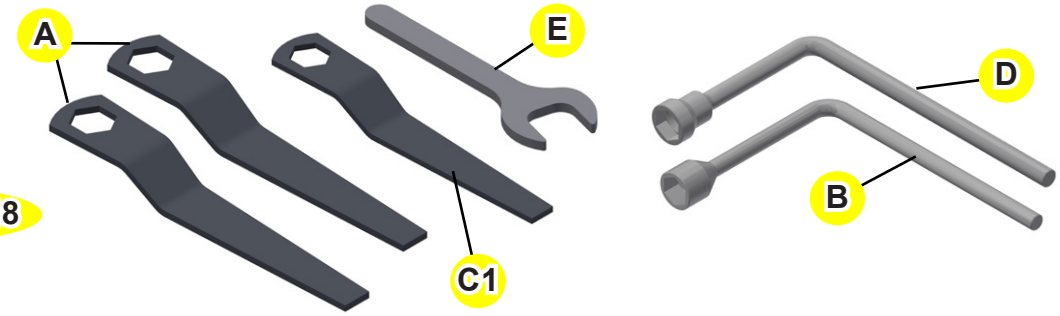
ATCRL
GAICR 300
ATCR 12 - 28
GAICR 12 - 30



ATCR 32 - 44
GAICR 32 - 40



GAICR 44 and 48



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

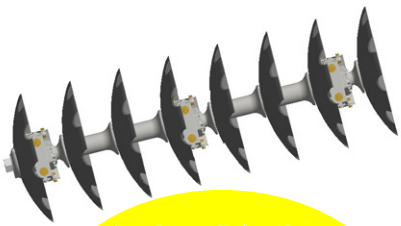
Assembly of bearings and spacer spools

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

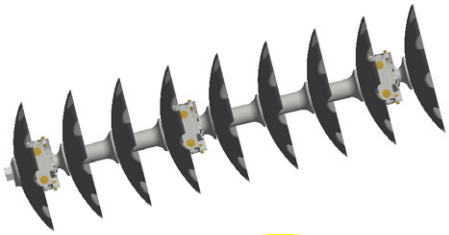
ATCR / ATCRL
12 disc blades
6 spacer spools
4 bearings
2 axles

ATCR / ATCRL
GAICR / GAICR 300
14 disc blades
8 spacer spools
4 bearings
2 axles

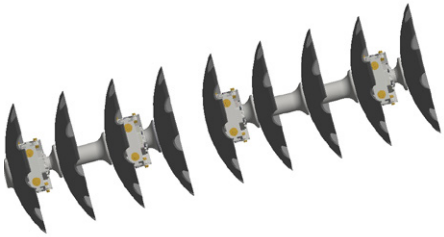
GAICR 300
16 disc blades
10 spacer spools
4 bearings
2 2.1/8" axles



ATCR / ATCRL
GAICR / GAICR 300
16 disc blades
8 spacer spools
6 bearings
2 axles



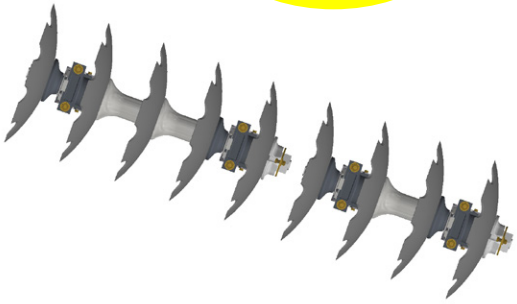
ATCR / ATCRL
18 disc blades
10 spacer spools
6 bearings
2 axles

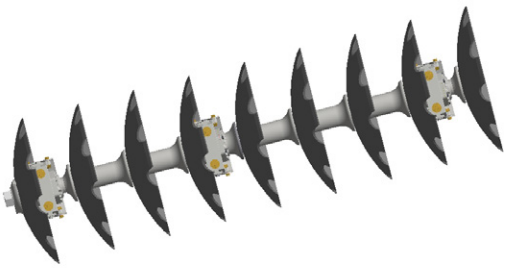


GAICR
18 disc blades
6 spacer spools
8 bearings
4 axles

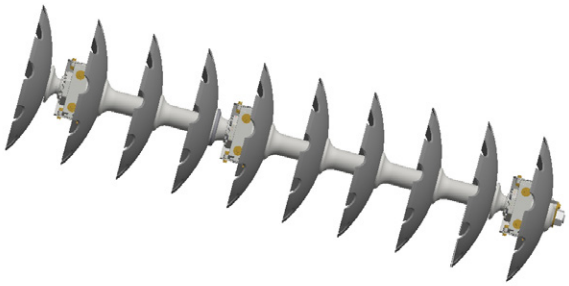
Assembly of bearings and spacer spools

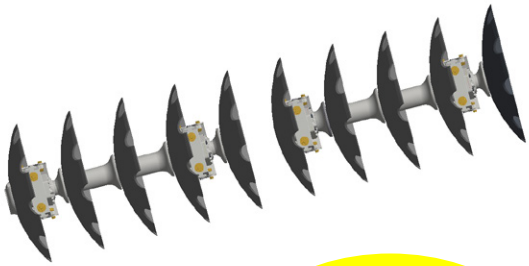
GAICR 300
18 disc blades
6 spacer spools
8 bearings
4 axles



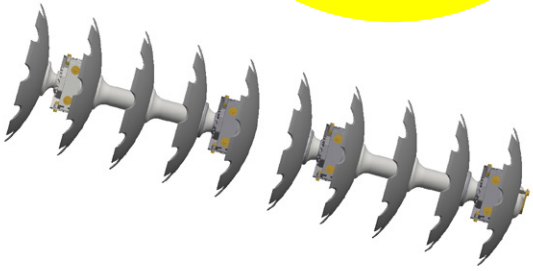


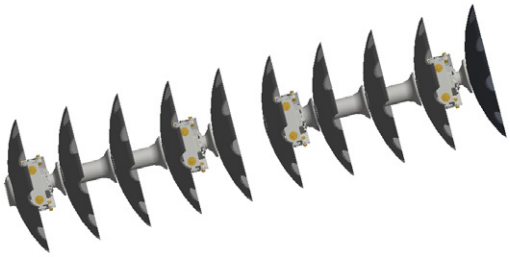
ATCRL
19 disc blades
11 spacer spools
6 bearings
2 axles



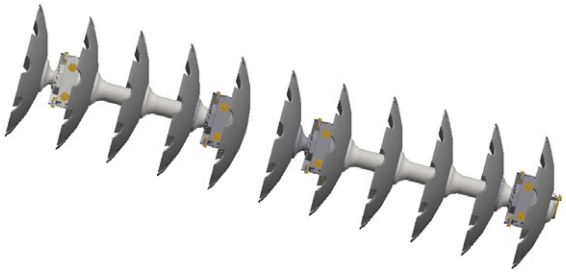


ATCR / ATCRL
GAICR / GAICR 300
20 disc blades
8 spacer spools
8 bearings
4 axles



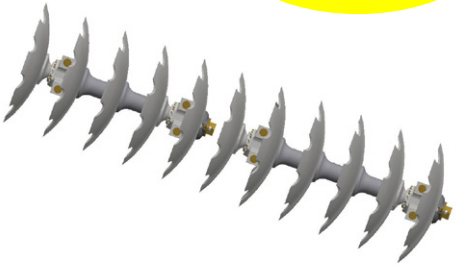


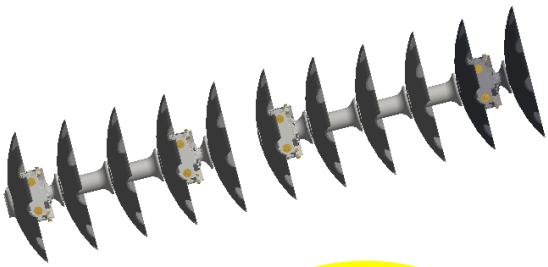
ATCRL
21 disc blades
9 spacer spools
8 bearings
4 axles



Assembly of bearings and spacer spools

ATCR
22 disc blades
10 spacer spools
8 bearings
4 axles

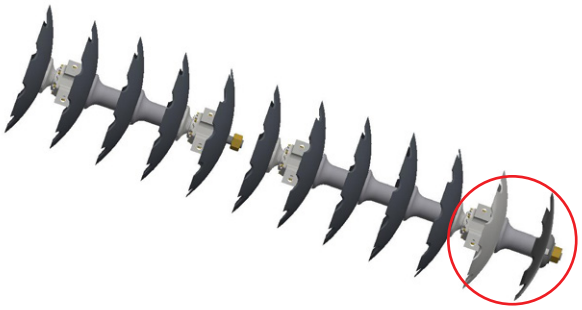




ATCR / GAICR
22 disc blades
10 spacer spools
8 bearings
4 axles

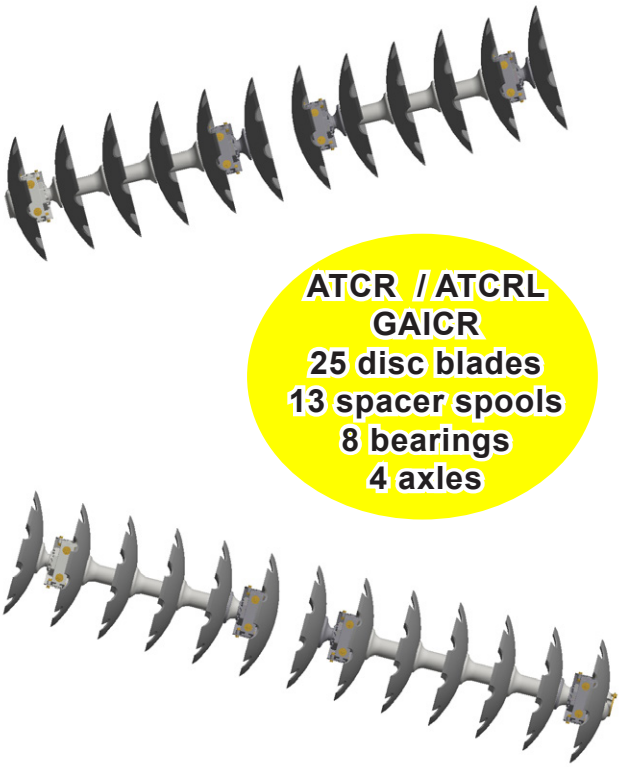
GAICR 300
22 disc blades
10 spacer spools
8 bearings
4 axles

ATCRL
23 disc blades
11 spacer spools
8 bearings
4 axles



Assembly of bearings and spacer spools

ATCR / ATCRL
GAICR / GAICR 300
24 disc blades
12 spacer spools
8 bearings
4 axles



ATCR / ATCRL
GAICR
25 disc blades
13 spacer spools
8 bearings
4 axles

ATCRL / GAICR
26 disc blades
14 spacer spools
8 bearings
4 axles

ATCR / GAICR 300
26 disc blades
14 spacer spools
8 bearings
4 axles

Assembly of bearings and spacer spools

ATCR / ATCRL
GAICR / GAICR 300
28 disc blades
16 spacer spools
8 bearings
4 axles

ATCR / ATCRL
29 disc blades
17 spacer spools
8 bearings
4 axles

GAICR
29 disc blades
14 spacer spools
10 bearings
5 axles

GAICR / GAICR 300
30 disc blades
12 spacer spools
12 bearings
6 axles

Assembly of bearings and spacer spools

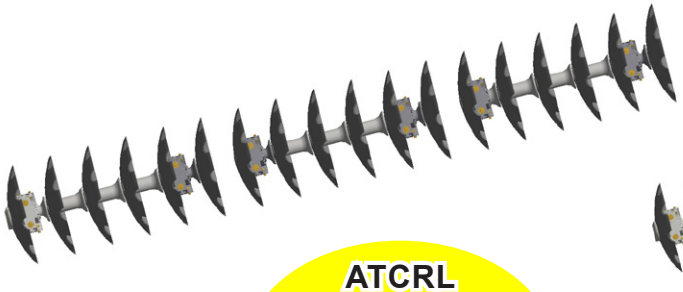
ATCR / GAICR
32 disc blades
14 spacer spools
12 bearings
6 axles

ATCRL
32 disc blades
20 spacer spools
8 bearings
4 axles

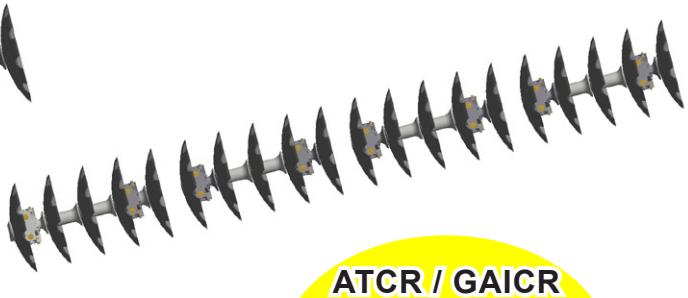
ATCRL
33 disc blades
21 spacer spools
8 bearings
4 axles

ATCR / ATCRL
GAICR
36 disc blades
18 spacer spools
12 bearings
6 axles

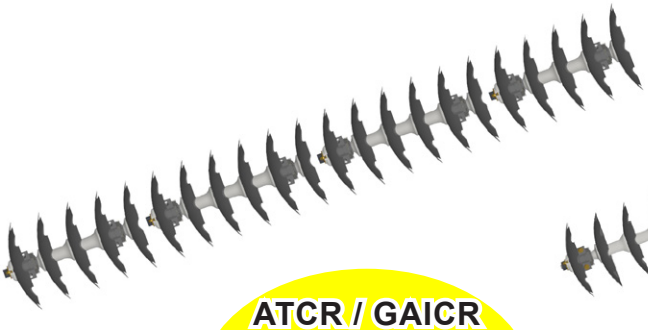
Assembly of bearings and spacer spools



ATCRL
37 disc blades
19 spacer spools
12 bearings
6 axles



ATCR / GAICR
40 disc blades
16 spacer spools
16 bearings
8 axles

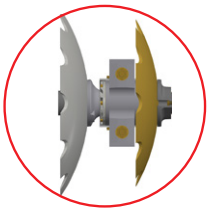


ATCR / GAICR
44 disc blades
20 spacer spools
16 bearings
8 axles

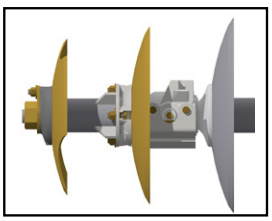
GAICR
48 disc blades
24 spacer spools
16 bearings
8 axles

Bearing

Spacer spool



Furrow filler



Tapered discs

Disc gangs assembly sequence

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

Tighten 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 the previous page.

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

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

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

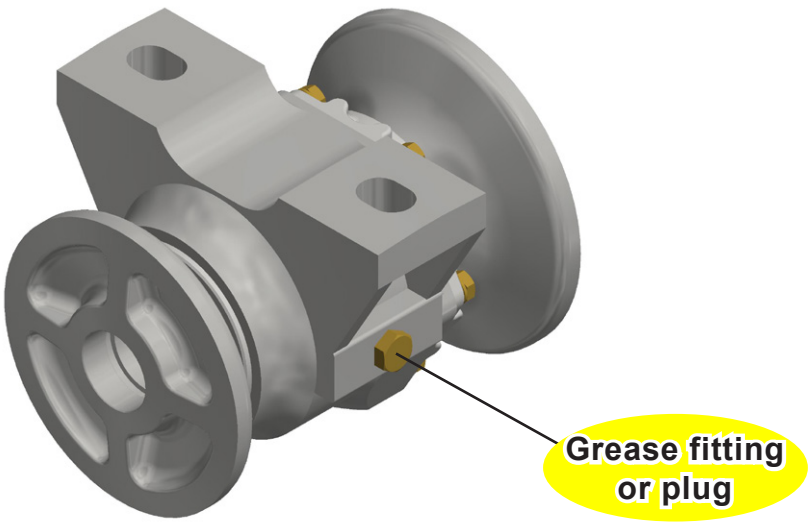
1) Place one of the wrenches on the outer side of the gangs (locked side), supporting it on the ground (As shown on the next page).

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

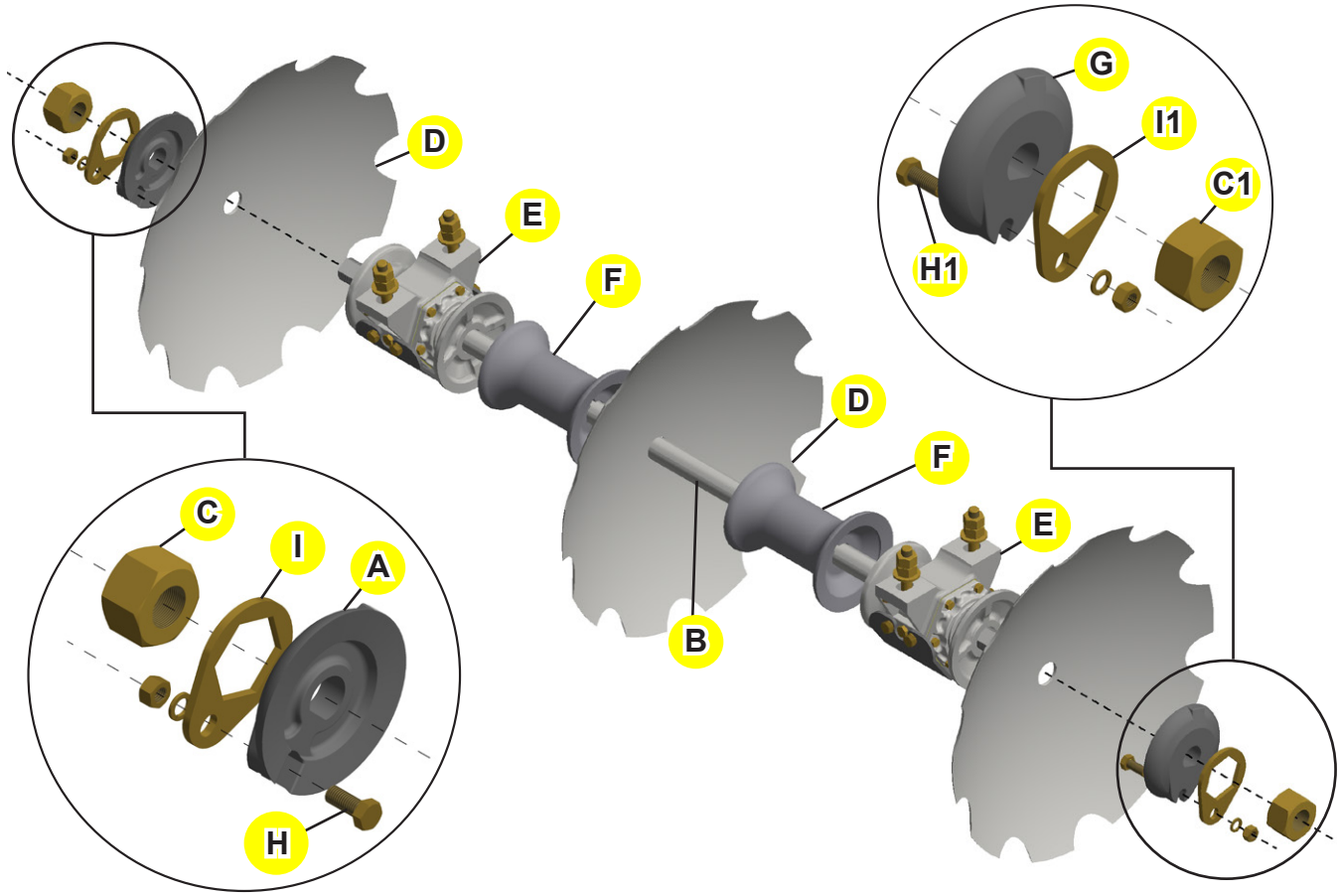
3) To tighten the gangs, underpin them with a piece of wood or another object to prevent their movement (As shown on the next page).

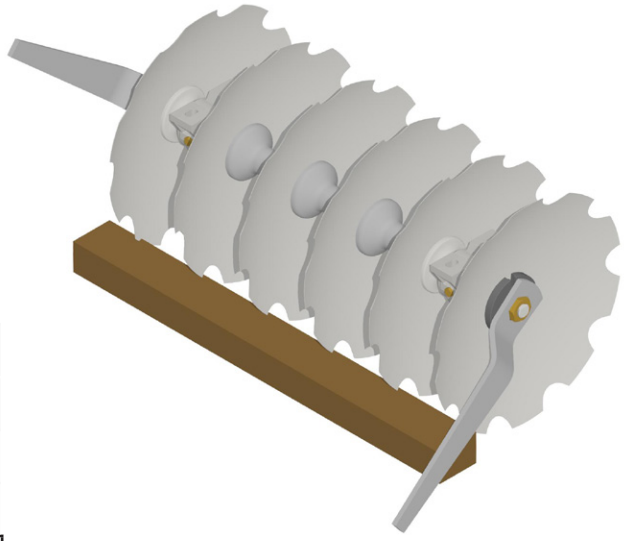
Lastly, place the bolt (H-1) and position the lock nut (I-1), fastening with a spring washer and nut.

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



Disc gangs assembly sequence





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

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

Furrow filler assembly sequence

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

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

Place the disc blades (D), bearings (E) and spacer spools (F), following the illustration on the next page.

Place the inner lock (G) and nut (C1).

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

Right after, underpin the disc blades to prevent their movement and tighten as shown on the next page, using the wrenches from the 'set of wrenches' page.

On the outer side of the gangs, couple the spacer spool (J) to the outer lock (A) using bolts (H1) and fastening with spring washers and nuts.

Fasten the furrow filler (K) to the spacer spool (J) and place the outer lock (L) on the spacer spool axle.

Then, fasten the nut (C2) to the spacer spool (J) axle.

Use the wrenches from the 'set of wrenches' page and tighten the gangs as follows:

1) Place one of the wrenches on the outer side of the gangs and support it on the soil. (As shown on the next page).

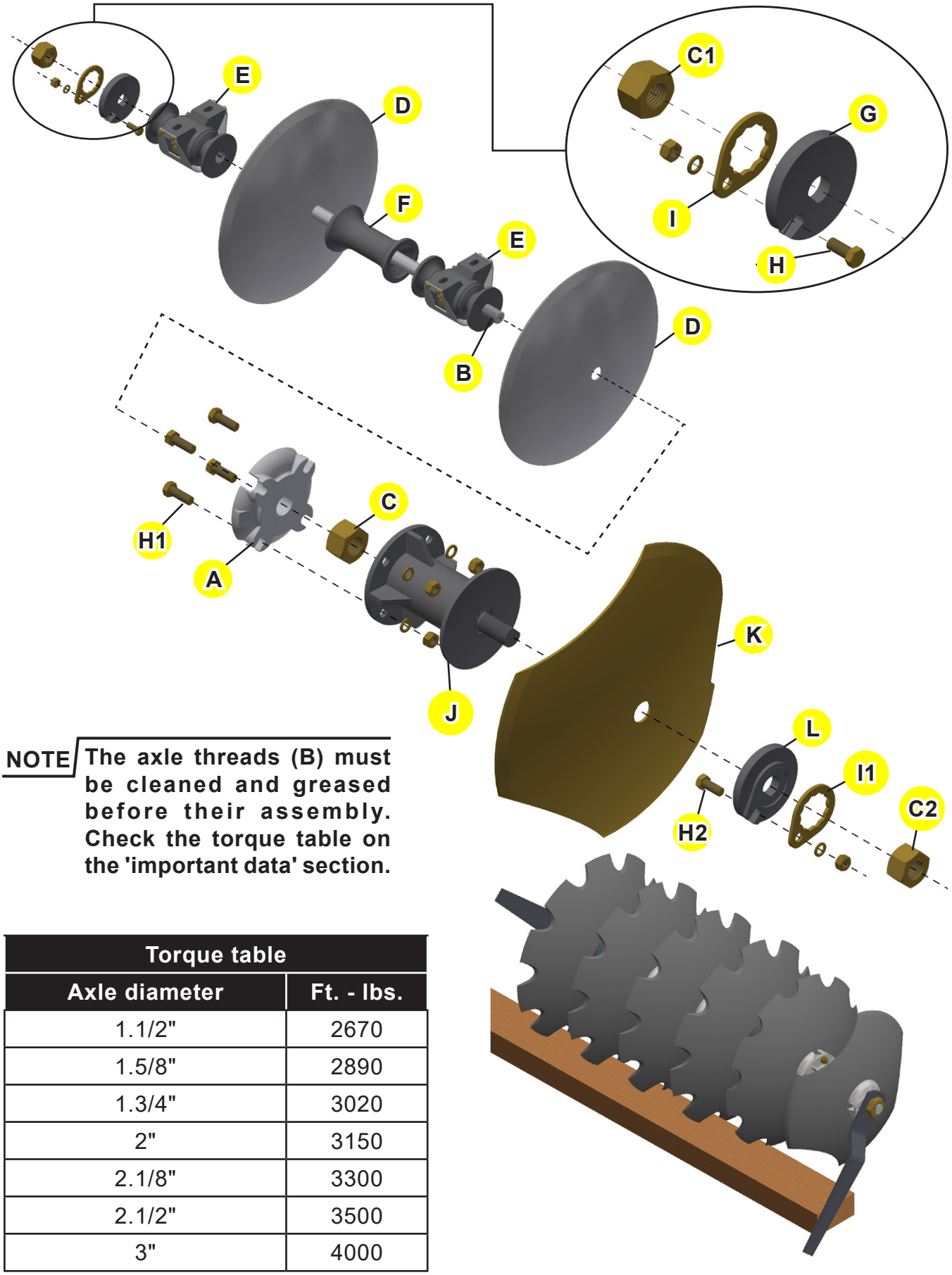
2) On the inner side, use the other wrench and tighten the gangs to get maximum torque.

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

Lastly, place the bolt (H2) and position the lock nut (I1), fastening with spring washer and nut.

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

Furrow filler assembly sequence



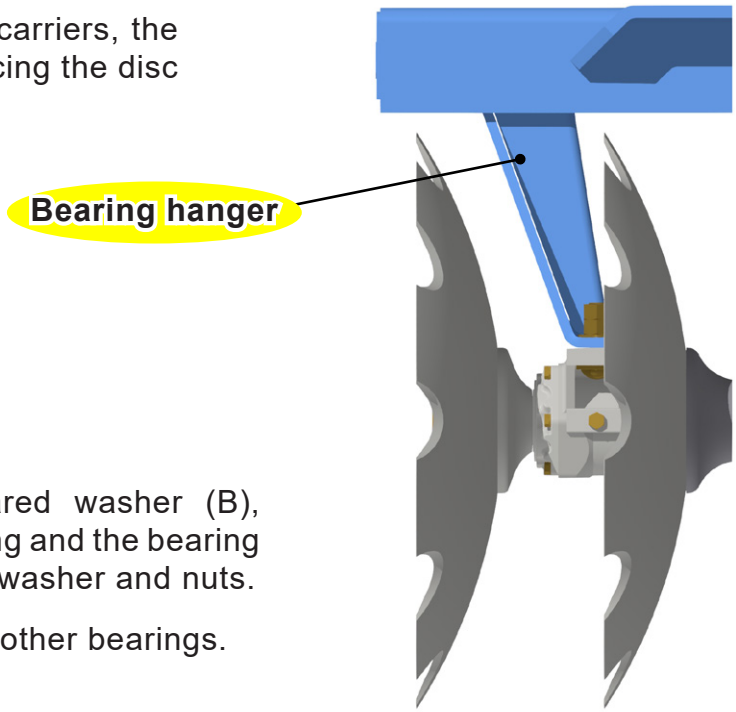
NOTE The axle threads (B) must be cleaned and greased before their assembly. Check the torque table on the 'important data' section.

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

Disc carrier assembly to the frame

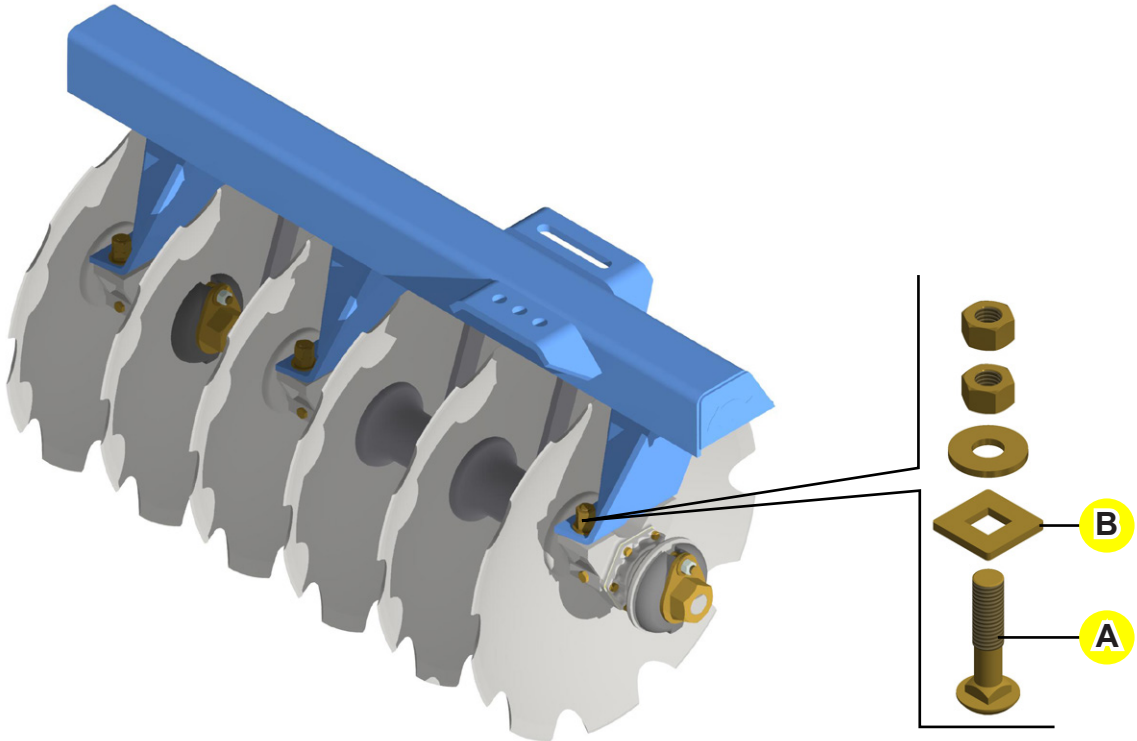
IMPORTANT **The rear gang turns earth to the left and the front gang turns earth to the right.**

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



Place a bolt (A) and squared washer (B), passing through the bearing housing and the bearing hanger holes. On top, place a flat washer and nuts.

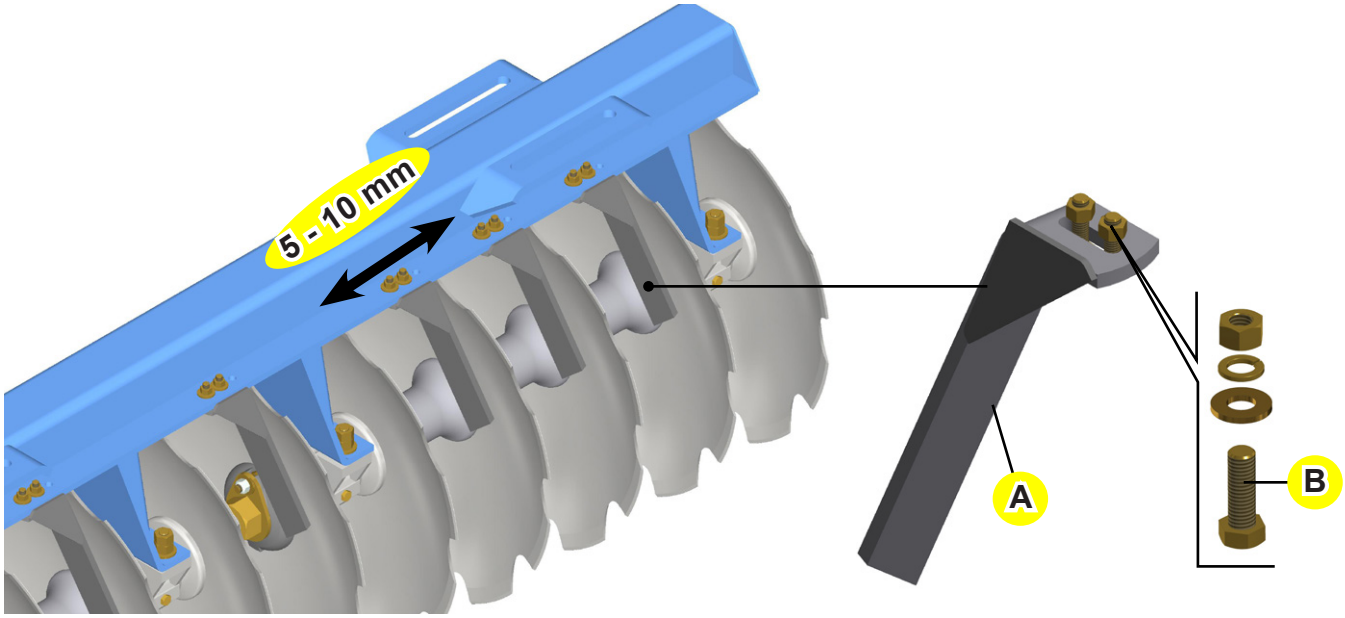
Repeat this operation for the other bearings.



Scrapers assembly

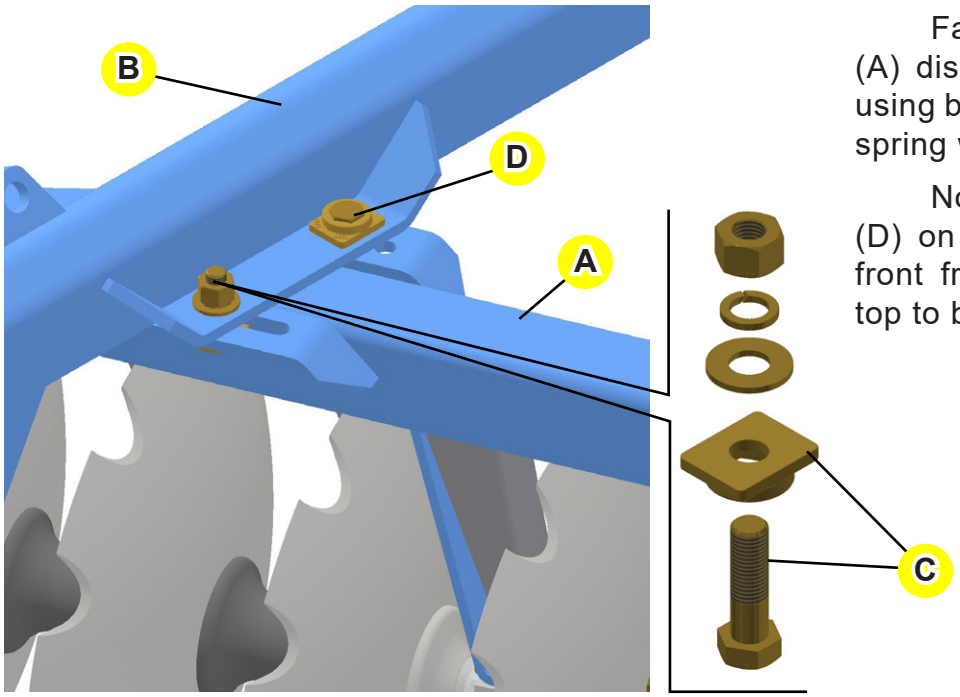
Note the fixing point of the scrapers with the end facing the concave side of the disc blades.

Assemble the scrapers (A) using bolts (B) and flat washers. On the upper part, place spring washers and nuts.



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

Disc carrier assembly to the frame

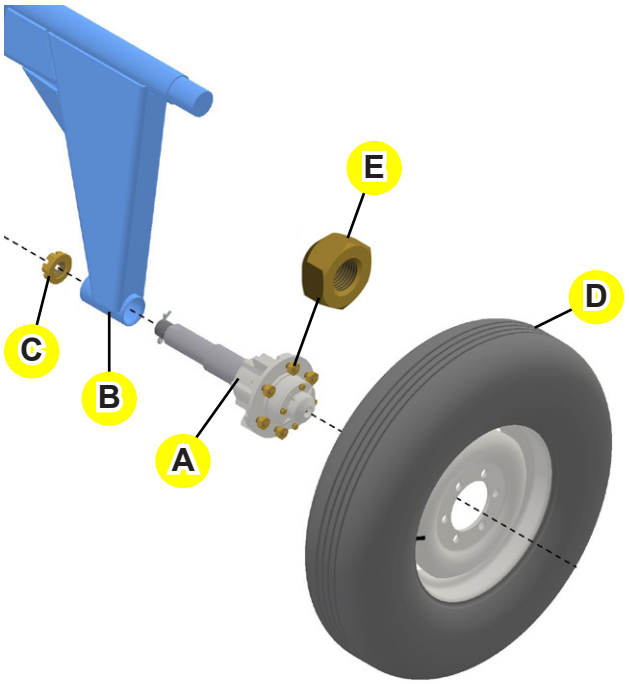


Fasten the front and rear (A) disc carrier to the frame (B) using bolts, lock (C), flat washers, spring washers and nuts.

Note that only the inner bolts (D) on the left hand side of the front frame are placed from the top to bottom.

NOTE **Check the opening adjustments through the fixation holes on the 'adjustments and operations' section (Cutting depth page).**

Tires assembly

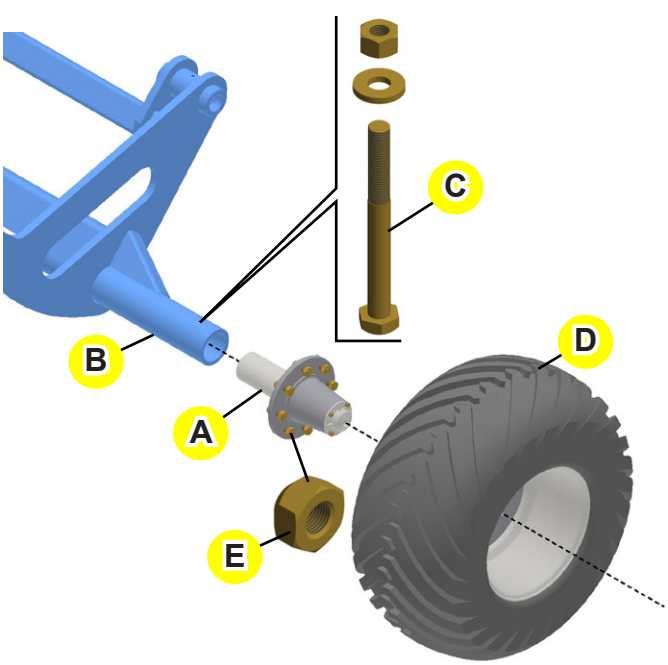


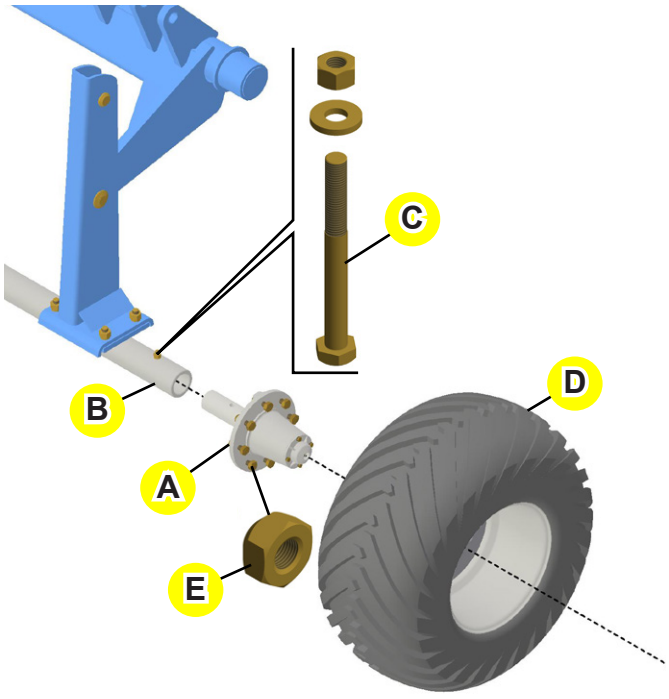
Couple the hubs (A) to the wheel arm (B) using castle nut (C) and cotter pin.

Then, couple the tires (D) to the hubs (A) fastening with the nuts (E).

Couple the hubs (A) to the wheel arm (B) using a bolt (C), flat washer and nut.

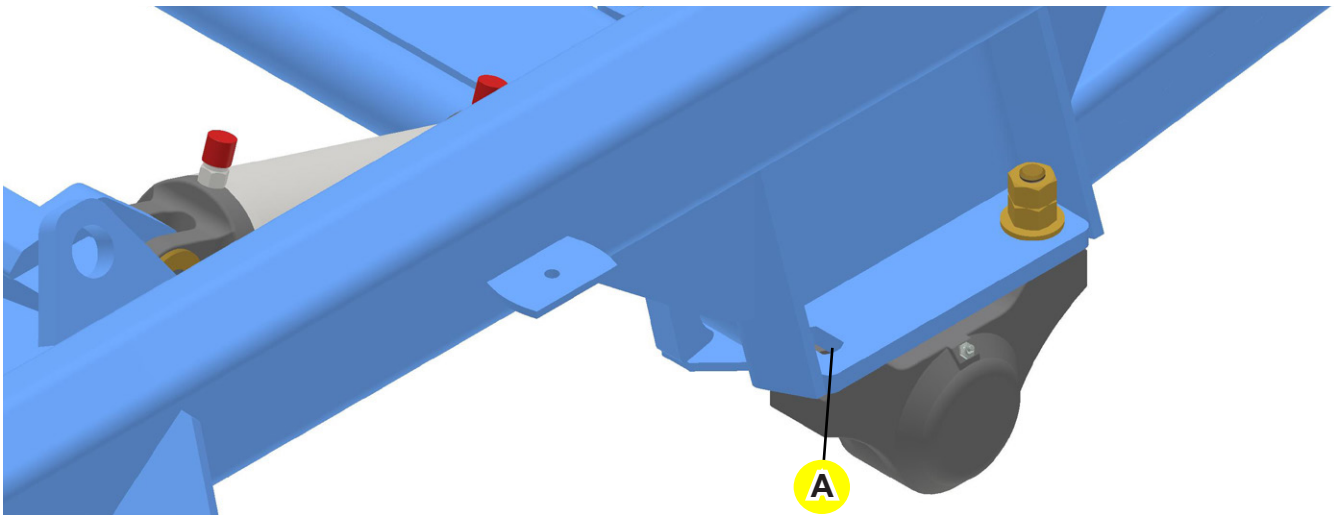
Couple the tires (D) to the hubs (A) and fasten using nuts (E).





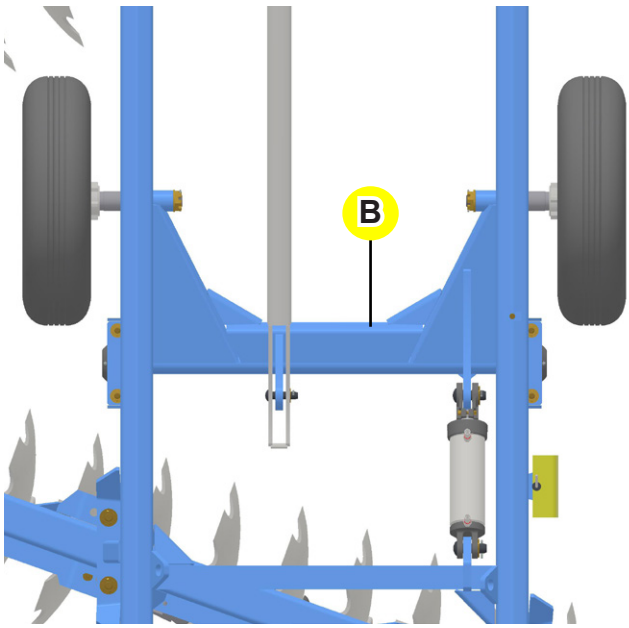
Adjusting the wheel support bearings

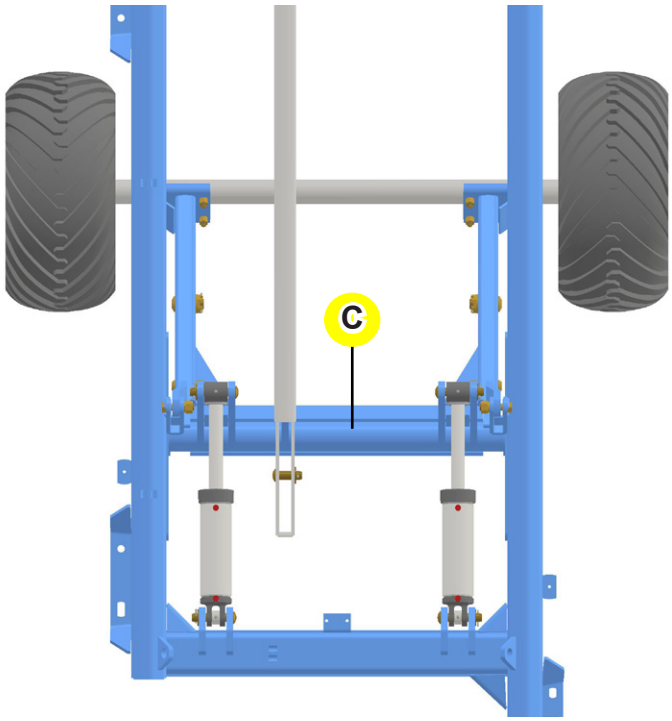
The disk harrows have an adjustment on the wheel support bearings by its slots (A). This adjustment can be used to centralize the wheel supports with the harrow structure and to eliminate lateral clearances between the articulation axles and the bearings.



Disk harrow with one cylinder: Adjust the bearings by centering the wheel support with the frame. Observe that the tires must have the same distance related to the frame. The wheel support axle (B) must have no clearance on the bearing.

Disk harrow with two cylinders: Adjust the bearings by centering the wheel support with the frame. Observe that the tires or the supporting rods must have the same distance related to the frame. The wheel support axle (C) must have no clearance on the bearing.

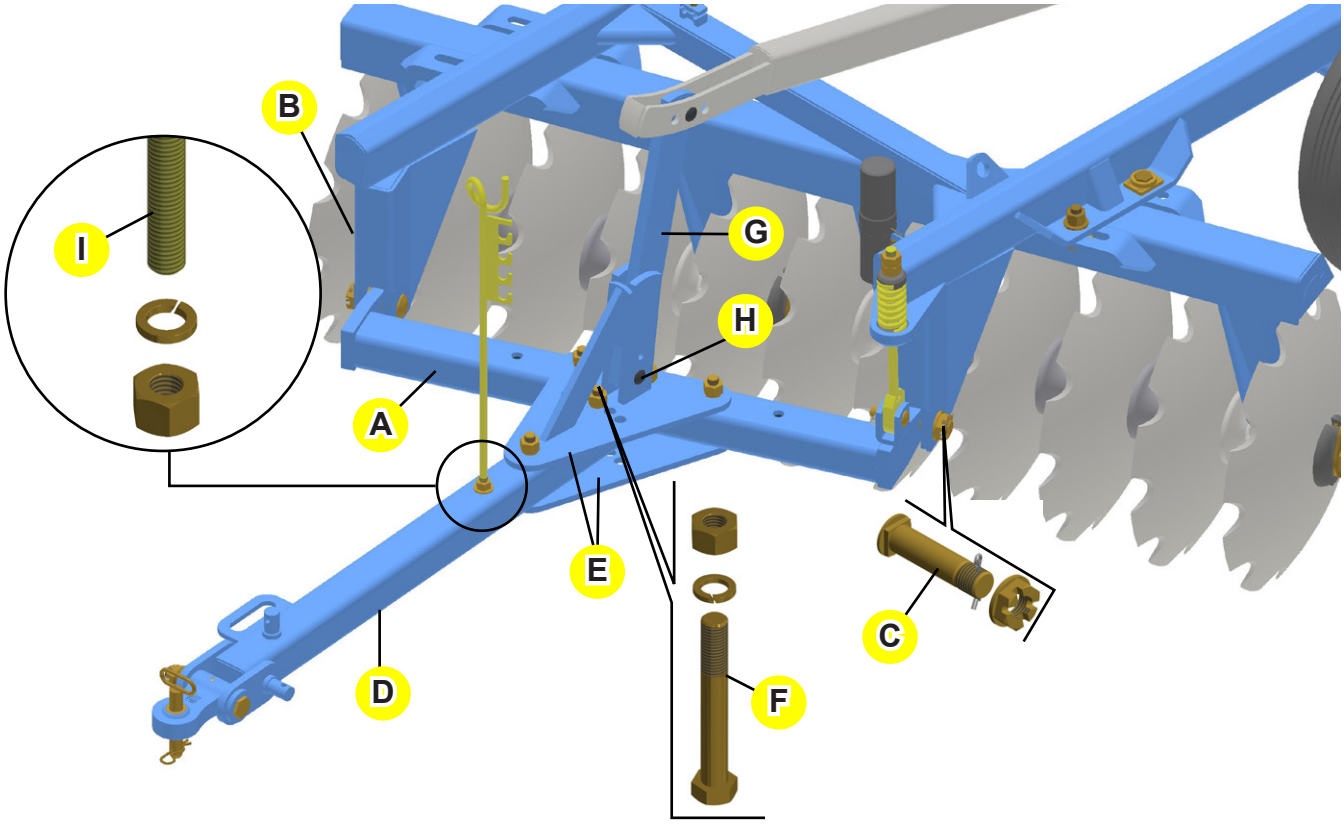




Drawbar assembly

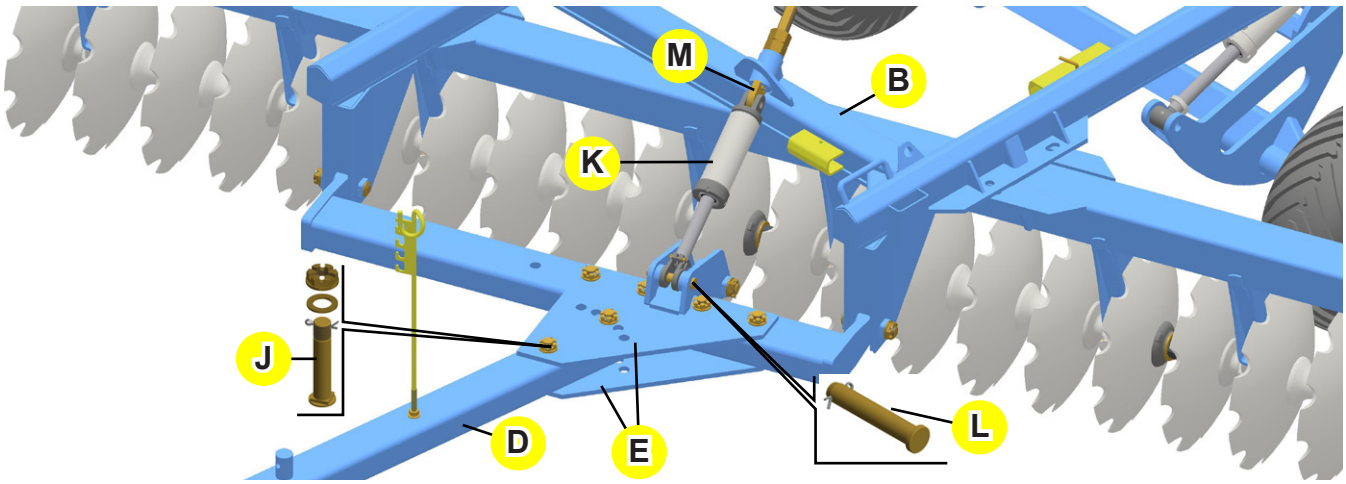
Couple the hitch bar (A) to the frame arms (B) using a junction axle (C), castle nut and cotter pin. Fasten the drawbar (D) to the plates (E) using a bolt (F), spring washer and nut.

Assemble the stabilizer bar support (G) to the upper plate (E) using a junction axle (H), flat washer and cotter pin. Assemble the hose support (I) using nuts and washers.



On the GAICR model with 44 and 48 disc blades, the drawbar (D) is fixed to the plates (E) using a bolt (J), castle nut and cotter pin.

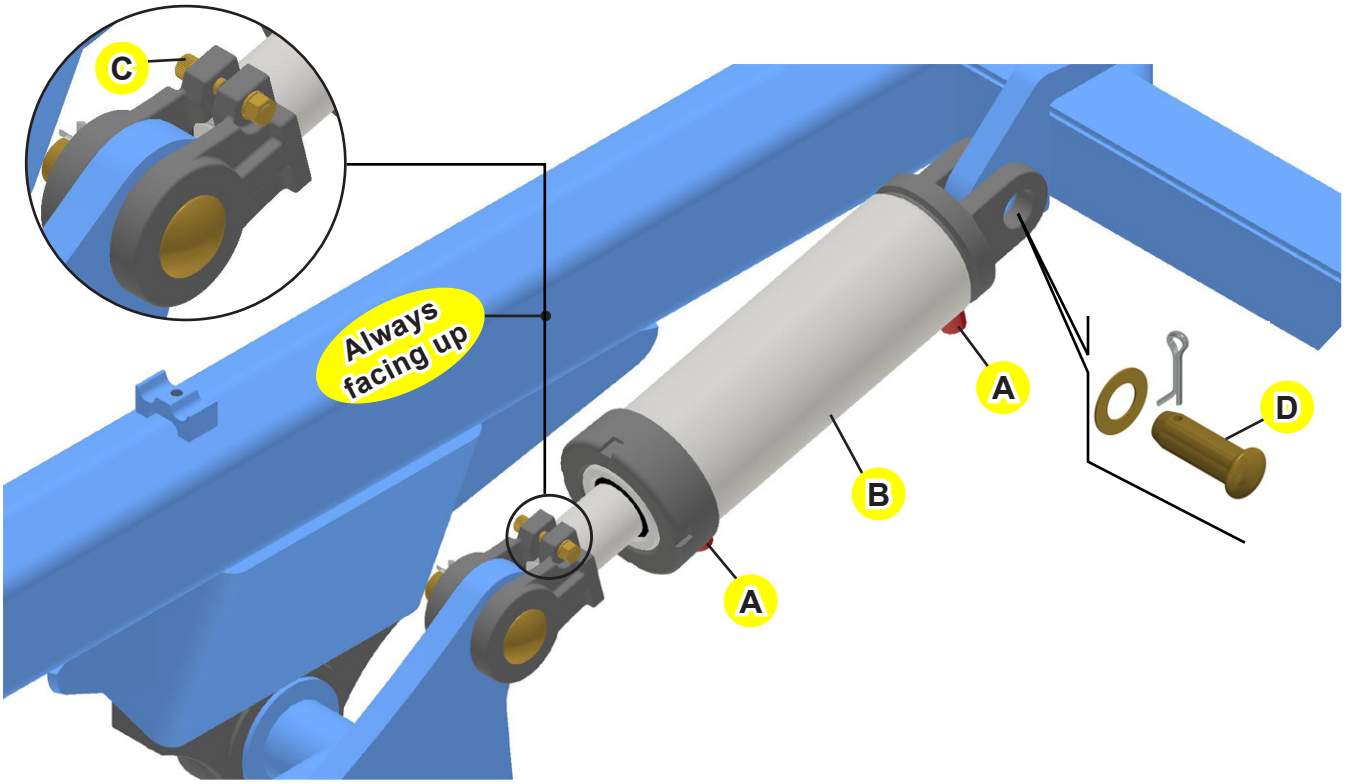
Assemble the cylinder (K) to the upper plate (E) using an axle (L) and cotter pin. Fasten the other end of the cylinder to the adjusting spindle (M) using junction axle and cotter pin, which is connected to the frame (B) with bolts.



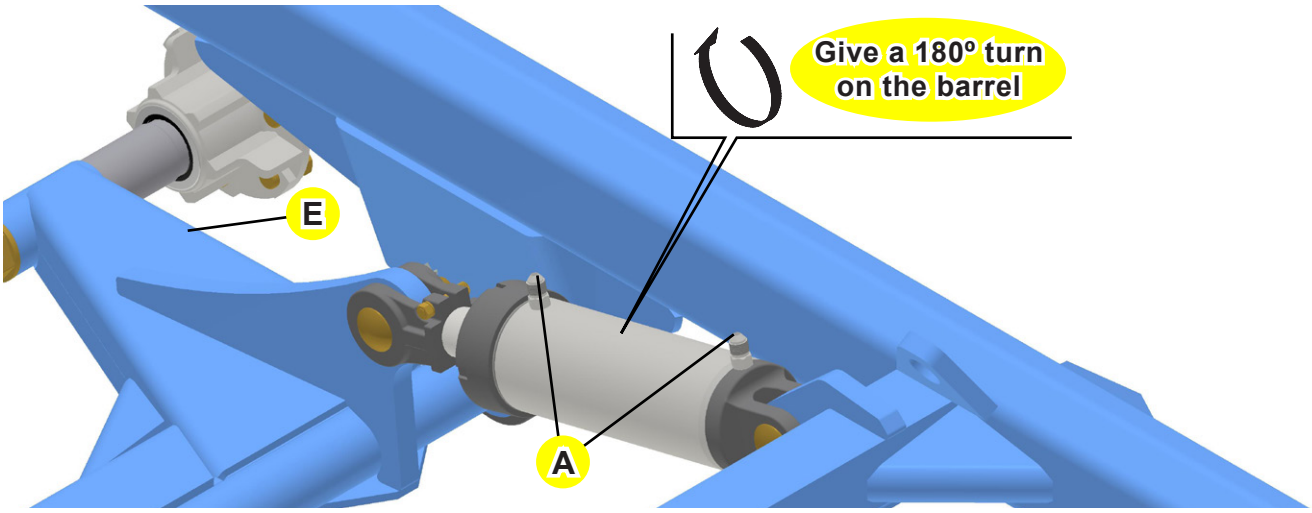
Cylinder assembly

The cylinder (B) ports (A) are delivered to the owner facing down in order to protect them. The bolt (C) must remain facing up.

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



Give a 180° turn on the cylinder barrel to let the ports (A) facing up and the cylinder rod must be pointing to the wheel support (E) direction, as shown on the illustration.

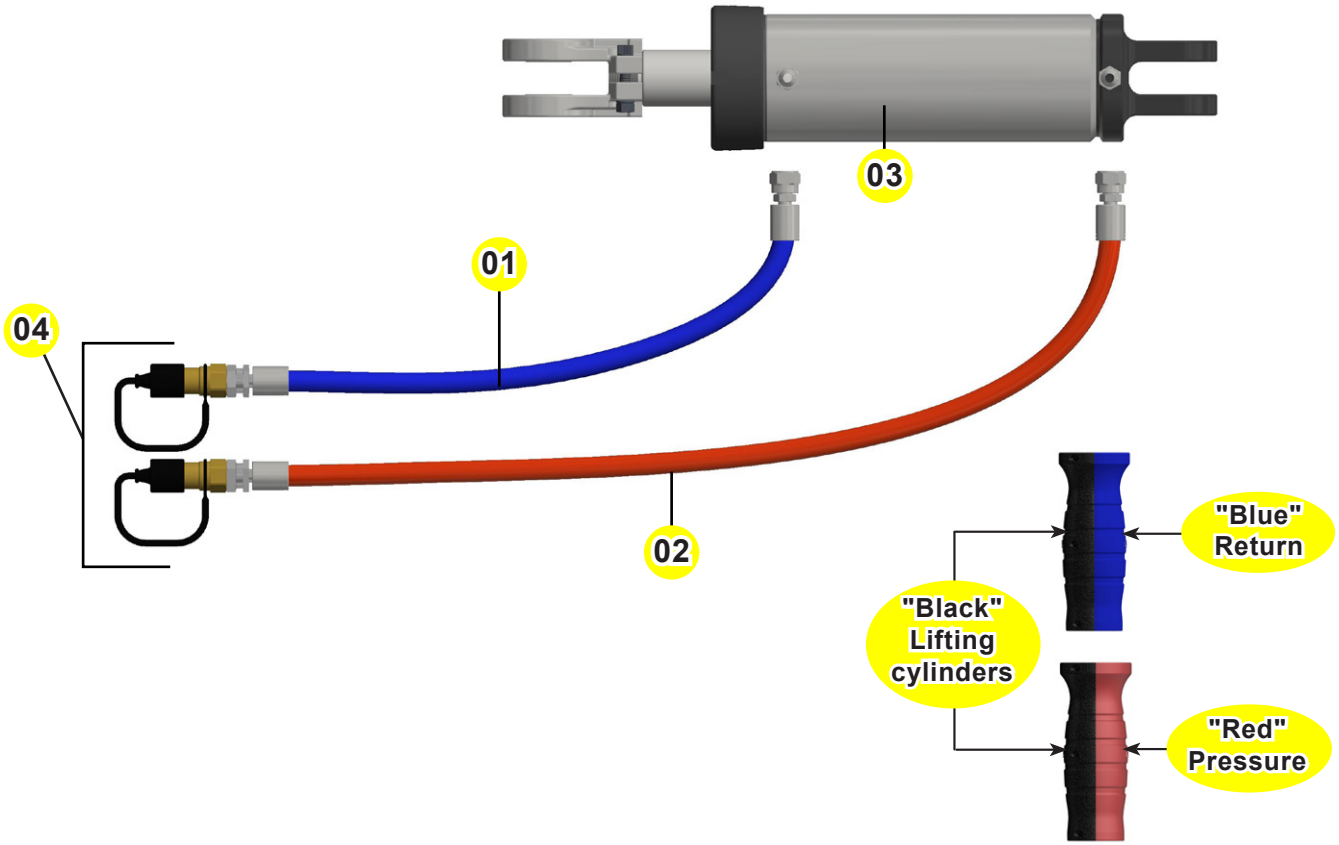


NOTE **Always use thread sealing tape to couple the male quick couplers to the hoses.**

Assembly

Assemble the hoses to the hydraulic cylinders with enough tightening and avoiding that the ports touch the soil.

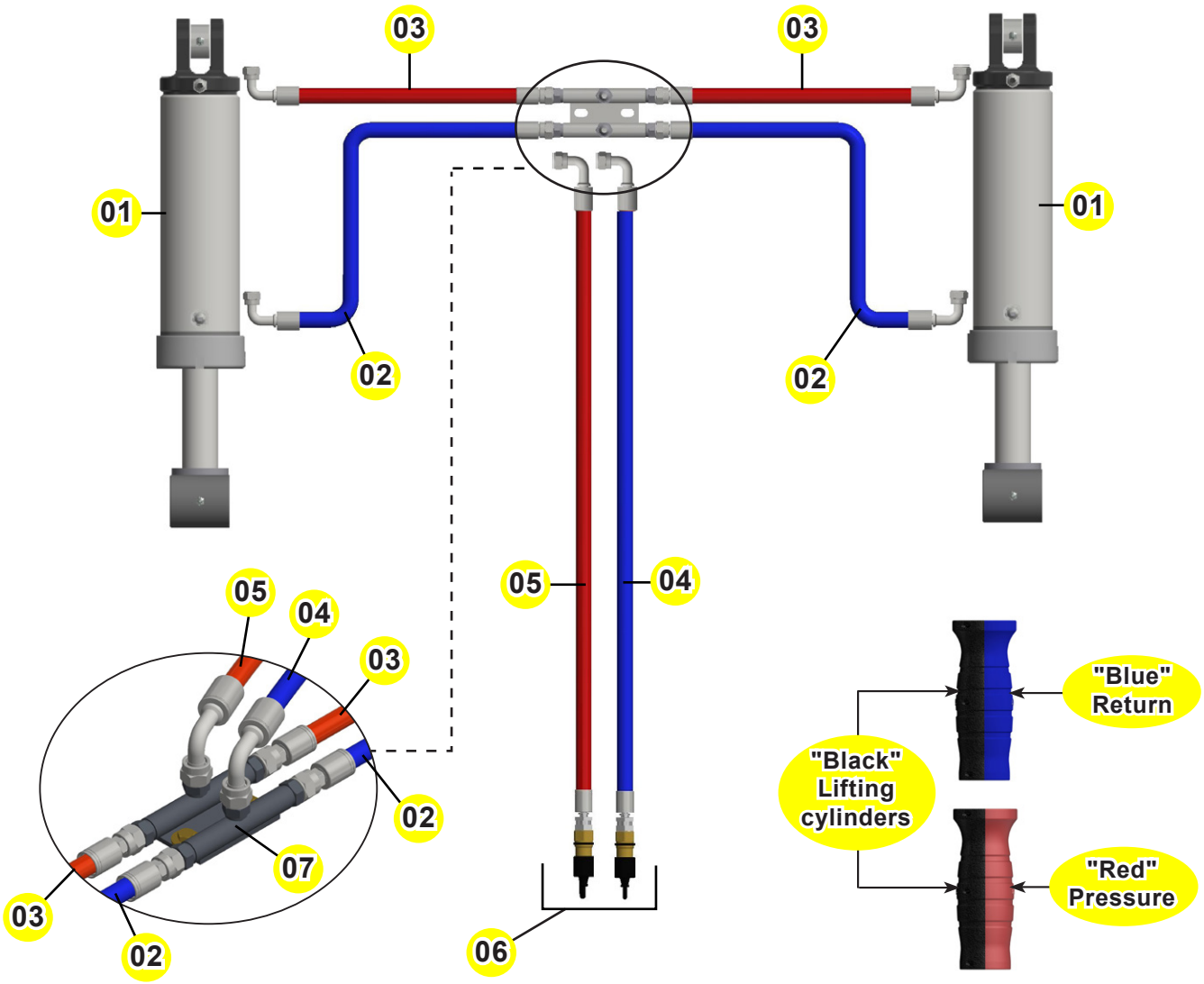
Hydraulic circuit (ATCR 12 - 29 / ATCRL 14 - 37 / GAICR 12 - 30 / GAICR 300 12 - 30 disc blades)



Item	Quantity	Description	
01	01	3/8 X 5850 TR - TM hose	Return
02	01	3/8 X 6000 TR - TM hose	Pressure
03	01	Hydraulic cylinder	
04	02	Male quick coupler 1/2 NPT with cap	

NOTE **The wheel support lifting cylinder rods must be facing the front part of the equipment.**

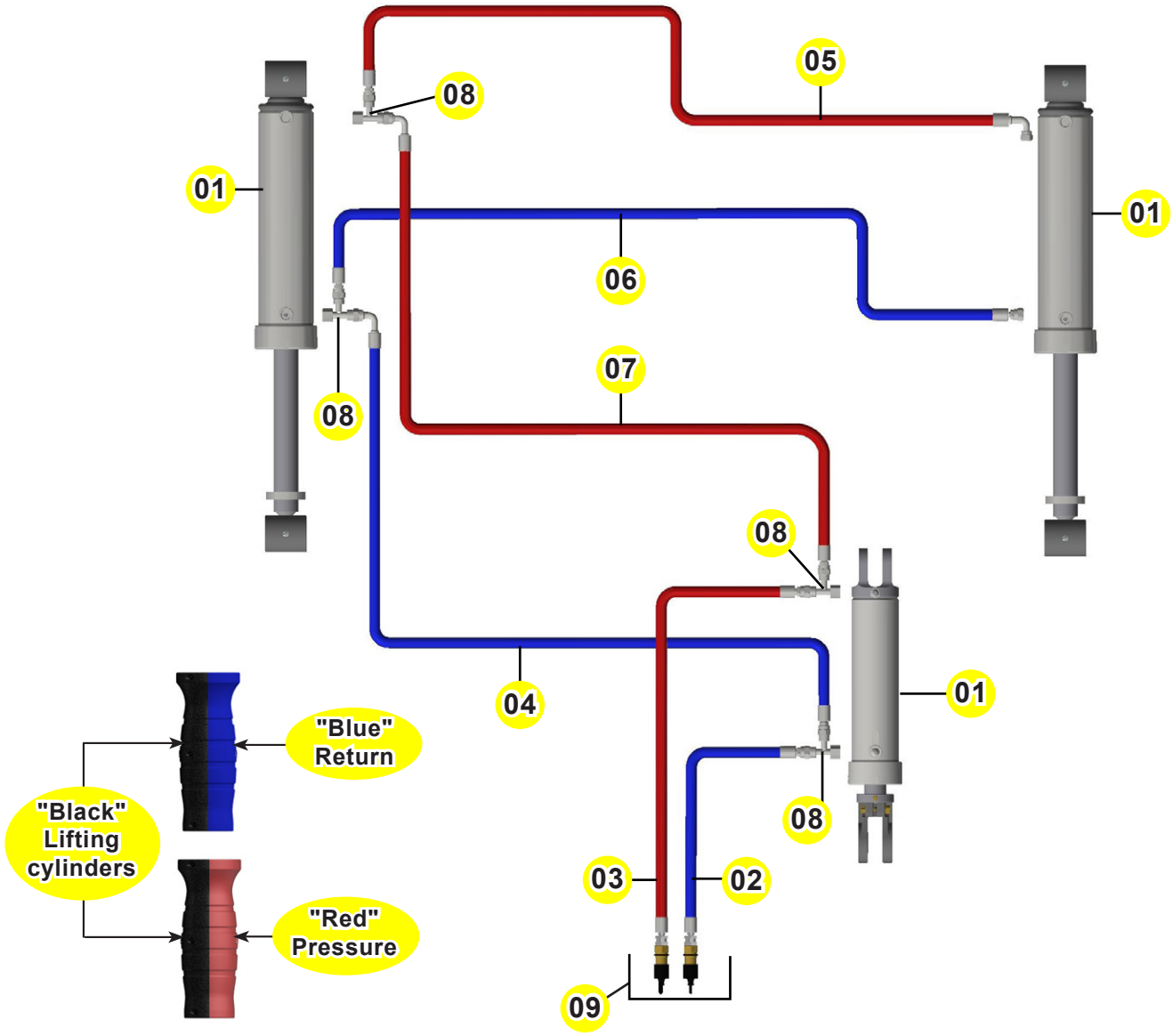
Hydraulic circuit (ATCR 32 - 44 / GAICR 32 - 40 disc blades)



Item	Quantity	Description	
01	02	Hydraulic cylinder	
02	02	3/8 X 450 TR - TC hose	Return
03	02	3/8 X 750 TR - TC hose	Pressure
04	01	3/8 X 8000 TC - TM hose	Return
05	01	3/8 X 8200 TC - TM hose	Pressure
06	02	Male quick coupler 1/2 NPT with cap	
07	01	Double connection	

NOTE **The wheel support lifting cylinder rods must be facing the front part of the equipment.**

Hydraulic circuit (GAICR 44 and 48 disc blades)



Item	Quantity	Description	
01	03	Hydraulic cylinder	
02	01	3/8 X 5500 TR - TM TERM OFS hose	Return
03	01	3/8 X 5500 TR - TM TERM OFS hose	Pressure
04	01	3/8 X 4000 TR - TC TERM OFS hose	Return
05	01	3/8 X 2200 TR - TC TERM OFS hose	Pressure
06	01	3/8 X 2000 TR - TR TERM OFS hose	Return
07	01	3/8 X 4500 TR - TC TERM OFS hose	Pressure
08	04	"T" 1/2 male adapter	
09	02	Male quick coupler 1/2 NPT with cap	

Set-up instructions

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

Preparing the tractor

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

The drawbar is used to get a better power supplied by the tractor to perform the equipment dragging.

Drawbar types:

Straight up and positioned on a single height related to the soil, without the option to adjust the hitching height;

Angled drawbar with two height adjustments (going up or down).

When the bar is totally retreated on its length, the operator must be aware for any curve or maneuvers, as the equipment drawbar may touch the tractor tires or damage the hydraulic hoses.

When using the tractor drawbar, lift the three-point hitches entirely.

The tractor drawbar must be compatible with the equipment. Do not exceed the static load capacity of the tractor drawbar.

Preparing the equipment

The equipment must always be parked on a dry and flat place, free from any debris or strange objects. Follow this procedure to set the equipment up:

Clean up to remove strange objects from the equipment and from the working area;

Make sure that there is enough room to maneuver the tractor until it hitches to the equipment;

Turn on the tractor and slowly approach it to the hitching point direction;

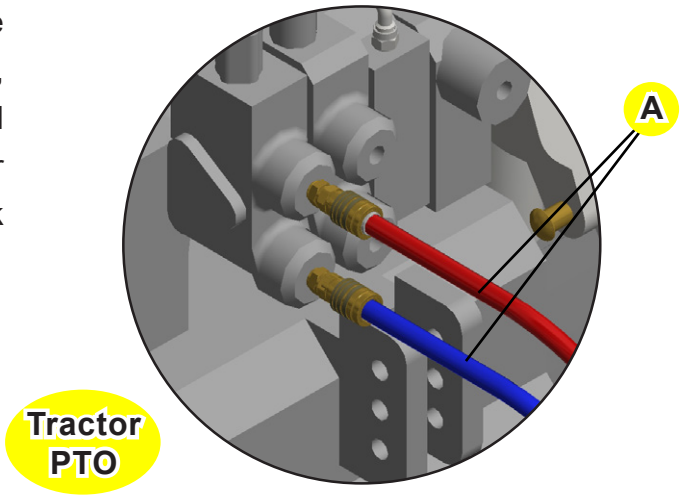
Use a clean cloth or a paper towel to clean the couplers in the end of the hoses. Also, clean the area around the tractor couplers;

Check the tires inflation and keep the same pressure on all tires (check the 'tires inflation' page in the 'maintenance' section);

Lubricate all grease fittings appropriately (see the 'lubrication' page in the 'maintenance' section).

Hitching to the tractor

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



Check the drawbar type from your tractor. To hitch the equipment, use the tractor drawbar.

Activate the control valve to lift the tires until the drawbar is on the same height as the tractor drawbar.

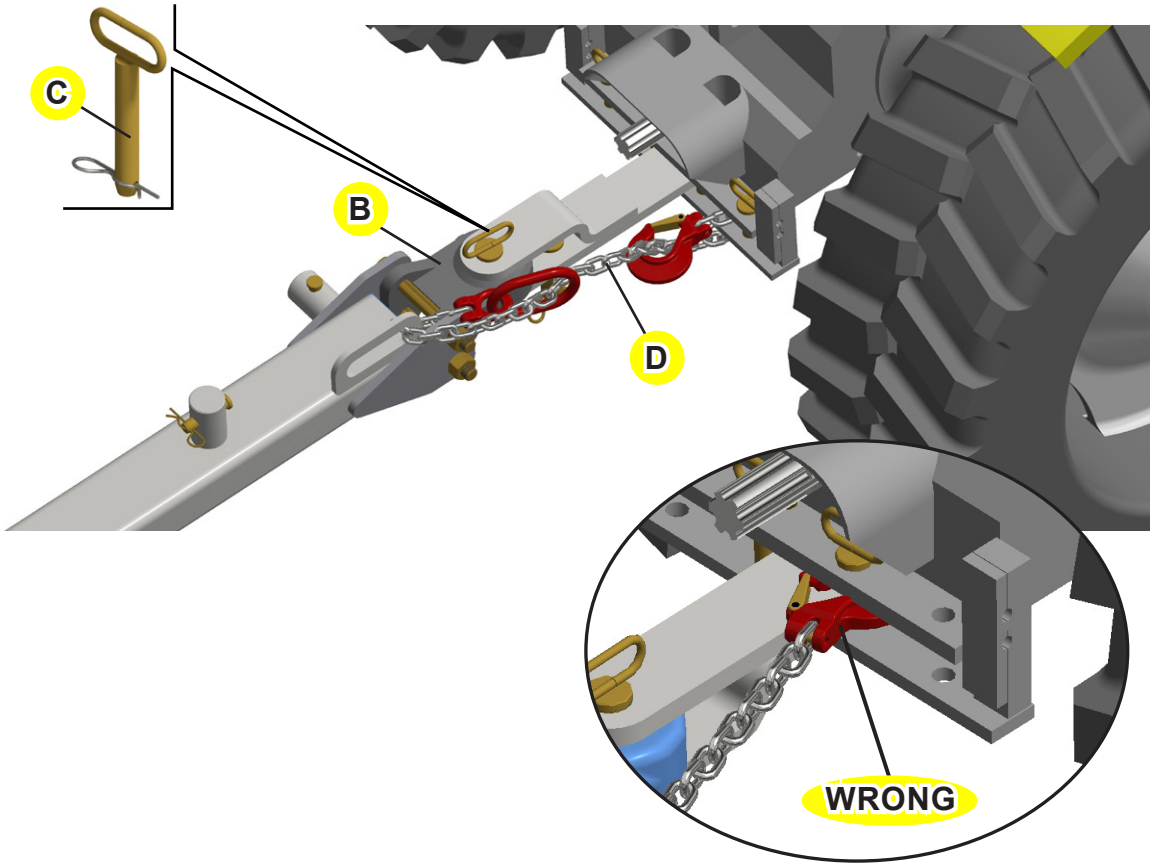
Couple the drawbar (B) to the tractor drawbar using an axle (C). To facilitate hitching, use the jack adjustment.

Fasten the safety chain (D) to the tractor and equipment, but leave a small clearance to allow the equipment to perform maneuvers.

WARNING

- **When setting up the equipment for the job, the tractor-equipment must be leveled related to the soil. Besides that, the tractor must be hitched to the equipment hitch to avoid unnecessary efforts during the set-up.**
- **When hitching the equipment to the tractor, use a chain to lock the equipment drawbar to the tractor hitch bar. This measure will prevent a possible rupture of any hydraulic hose or breaks on the hitching system, what would make the equipment tilt up.**
- **The correct way to hitch the safety chain (D) may vary according to the tractor model. However, the hitch and the hoop must pass through the chain links as shown on the illustration from the next page. Never hitch the hook without passing it through the chain.**

Hitching to the tractor



ATTENTION

Keep the drawbar loose during work and fixed during transportation.

During transportation, the hydraulic lower arms must remain adjusted.

Relieve the control valve pressure pressure and lower the equipment before removing the hoses.

Important recommendations

The tractor drawbar must remain loose during working and fixed during transportation.

Always lower the disk harrow and relieve the control valve pressure in order to remove the hoses.

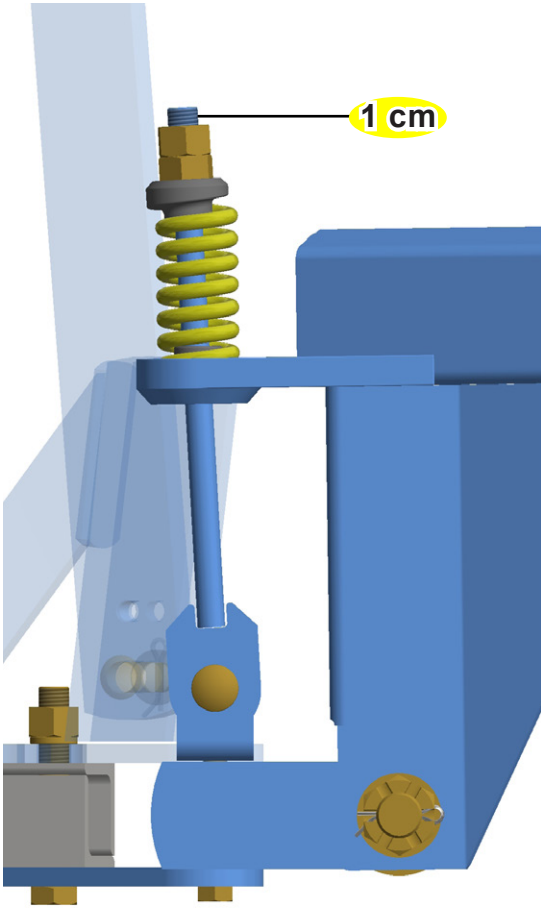
The drawbar spring must be adjusted leaving 1 cm (one centimeter) of thread in the rod, above the nut and locknut. Such adjustment must be kept both in transportation and at work.

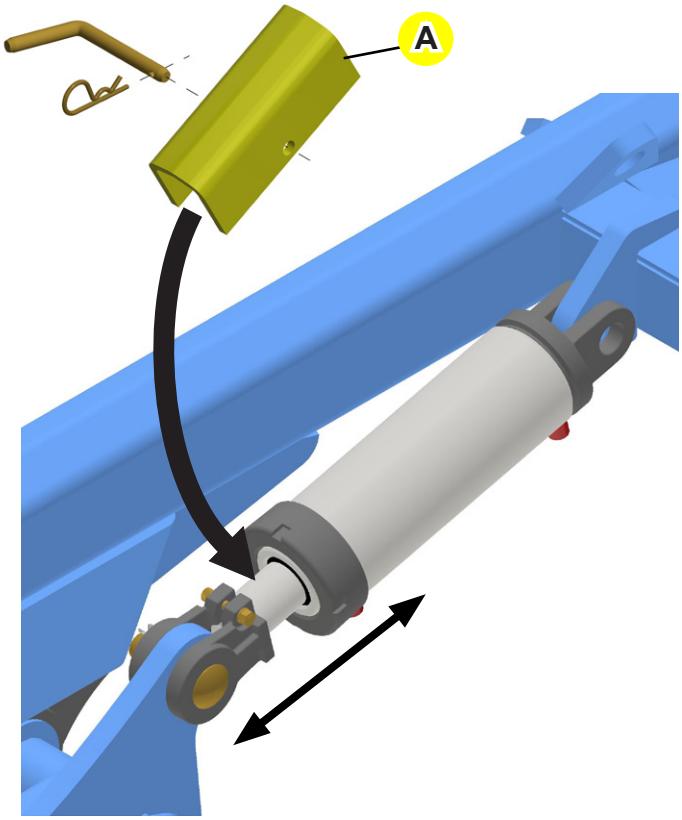
Lower the disk harrow so that the disc gangs rest on the ground. Adjust the nuts on the rod only until they touch the spring bracket, without compressing it. This is the proper adjustment both for work and transportation.

Before starting working, make sure nuts and bolts of all parts are properly tightened, especially the ones on the disc blade gangs, otherwise the axle and other components may be damaged.

To transport the equipment over long distances, it is necessary to use the transport lock (A), which is coupled to the hydraulic cylinder rod.

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





NOTE **When assembling, note that the cylinder must be as shown in the figure, being its rod facing the front part of the disk harrow.**

When using a tractor that has a different drawbar height, redo the adjustments.

Cutting depth adjustment - disc gangs opening

The cutting depth can be adjusted in two ways:

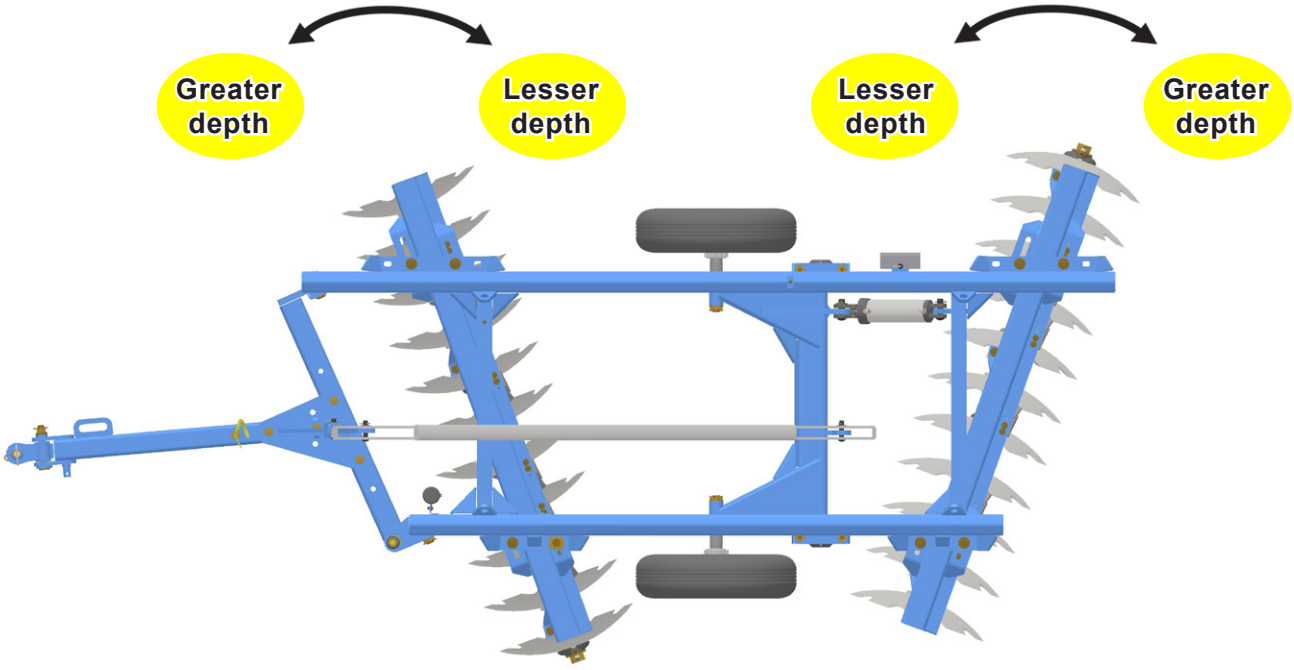
1) By adjusting the opening angle (lock) of the disc gangs.

2) By activating the hydraulic cylinder so the tires can work as depth stops.

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

Increase the opening angle between the gangs to work over soils with greater difficult to penetrate the disc blades. In light and loose soils, the opening angle must be smaller.

This adjustment is done by changing the disc gang fixation on the frames.



IMPORTANT

To start the harrowing, we recommend an average disc gang opening. If a greater penetration is required, increase the opening angle of the rear disc gang.

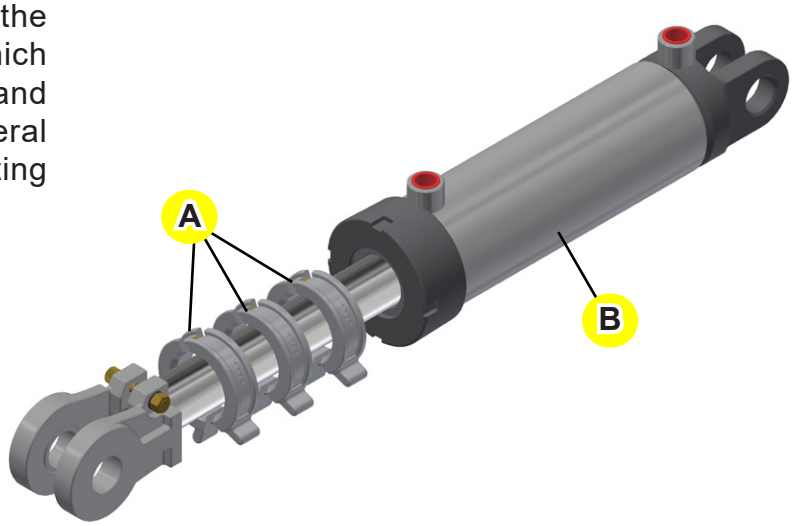
The front gang usually operates with a greater opening compared to the rear one.

The harrowed ground 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.

Cutting depth - depth stops (optional)

To control the depth with the tires, use the depth stops (A) which are placed on the cylinder rods (B) and work as depth stops, allowing several adjustments of the disc blades cutting depth.



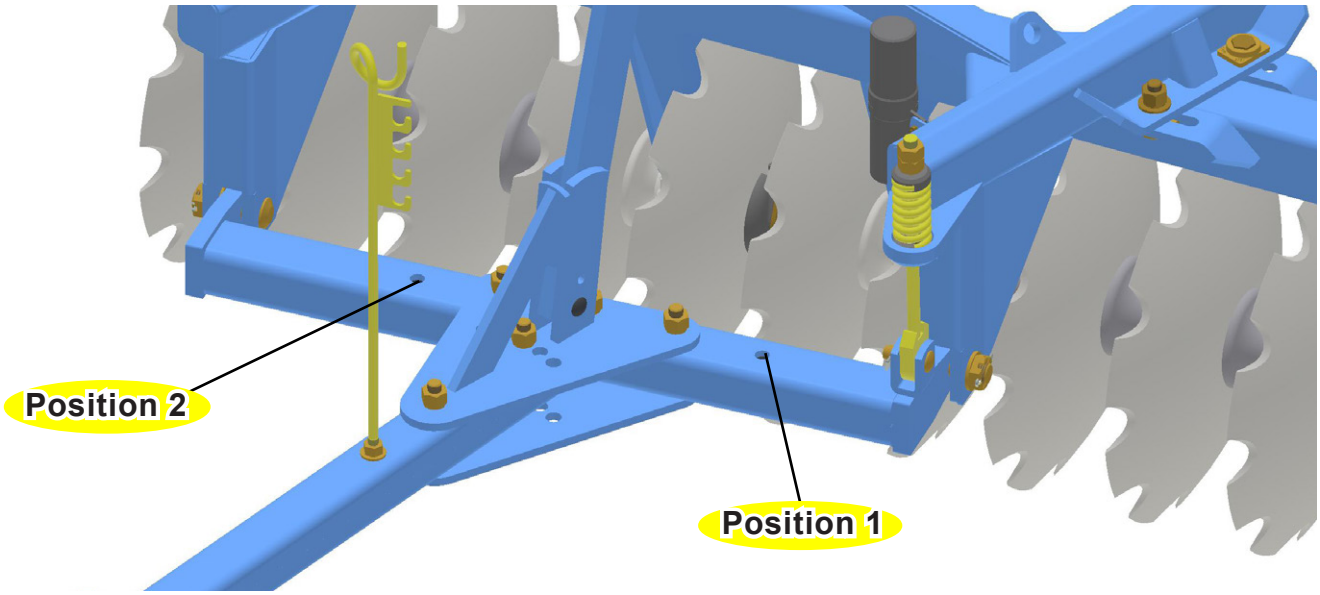
Tractor position related to the previous pass - lateral displacement

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

This positioning is obtained due to the tractor gauge and disk harrow cutting width.

Whenever possible, the tractor should pass over the unworked soil and next to the last furrow.

The lateral displacement is done by changing the position of the drawbar on the hitch bar, as shown below:

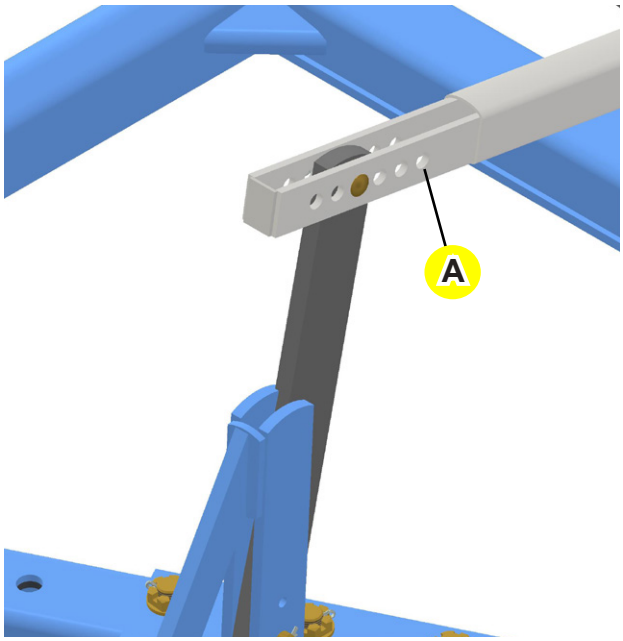


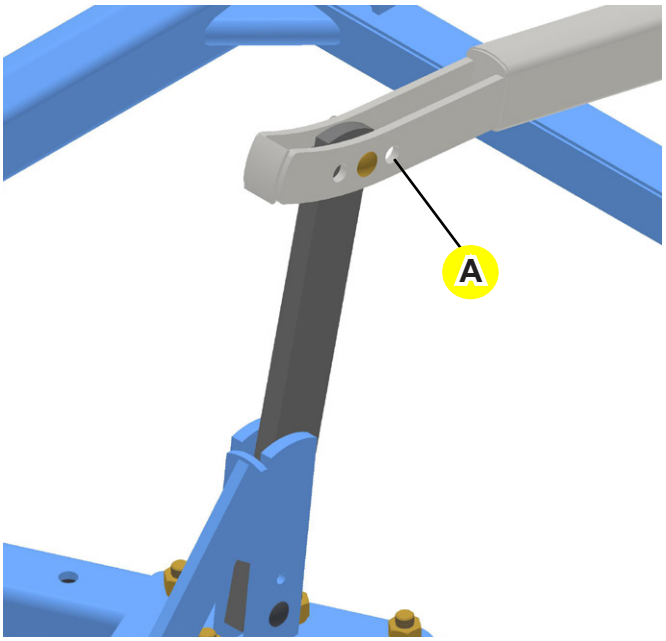
Normal position (centered): Used on most situations.

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

Position 2: Allows the tractor to get farther from the previous furrow.

NOTE **When adjusting the lateral displacement, it is also necessary to change the fixation of the stabilizer bar (A) to adjust the level for transportation.**

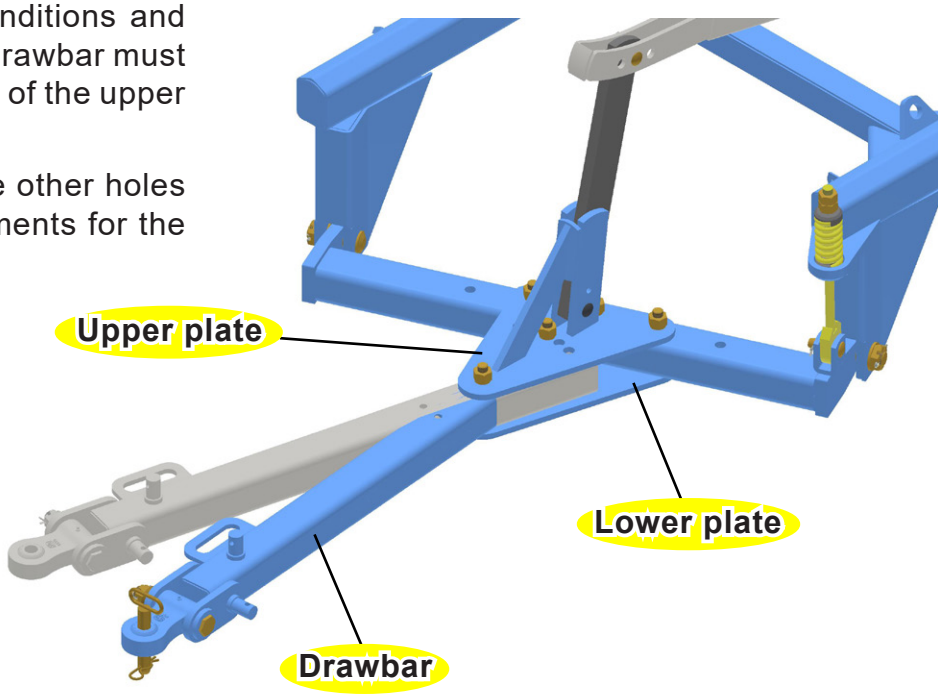




Drawbar angle

In normal working conditions and during transportation, the drawbar must be fixed on the central hole of the upper and lower plates.

Change the bar to the other holes to get small side displacements for the disk harrow.



SUMMARY:

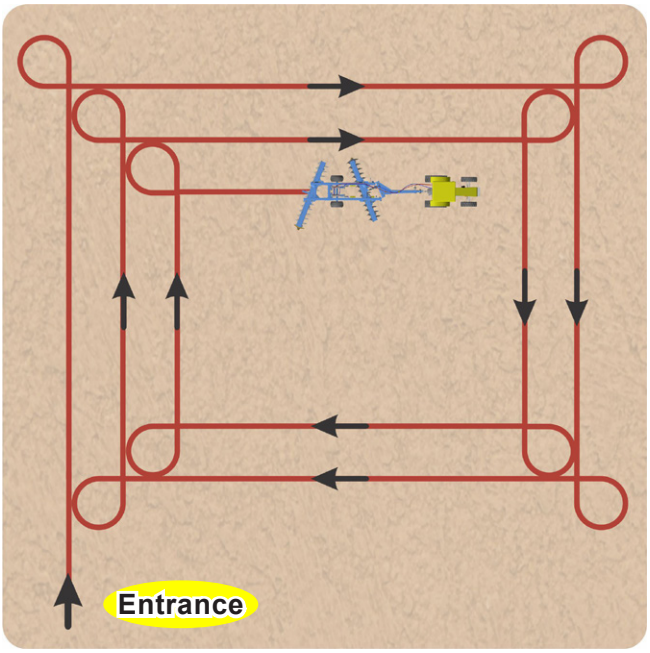
The disk harrows will operate properly if they are covering the tractor trace and if there is no lateral deviation.

The tractor and equipment drawbar must be as aligned as possible with the working direction.

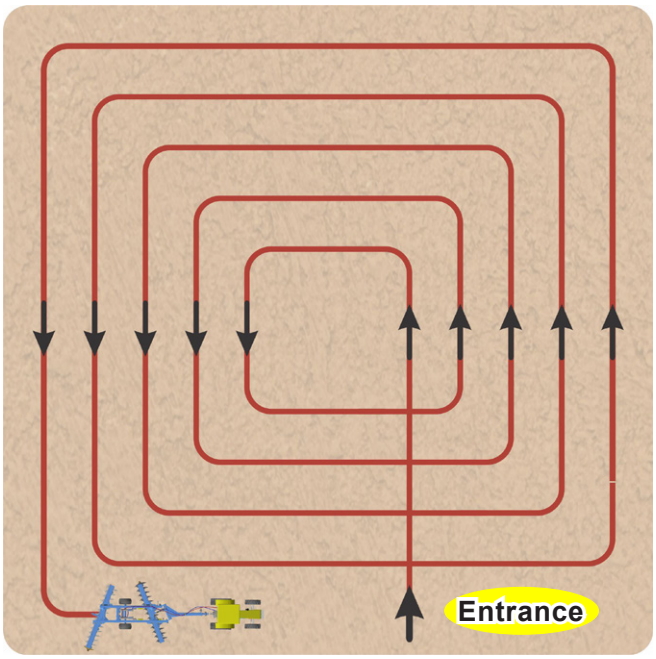
The drawbar must remain loose during work and transportation.

Ways to start the harrowing

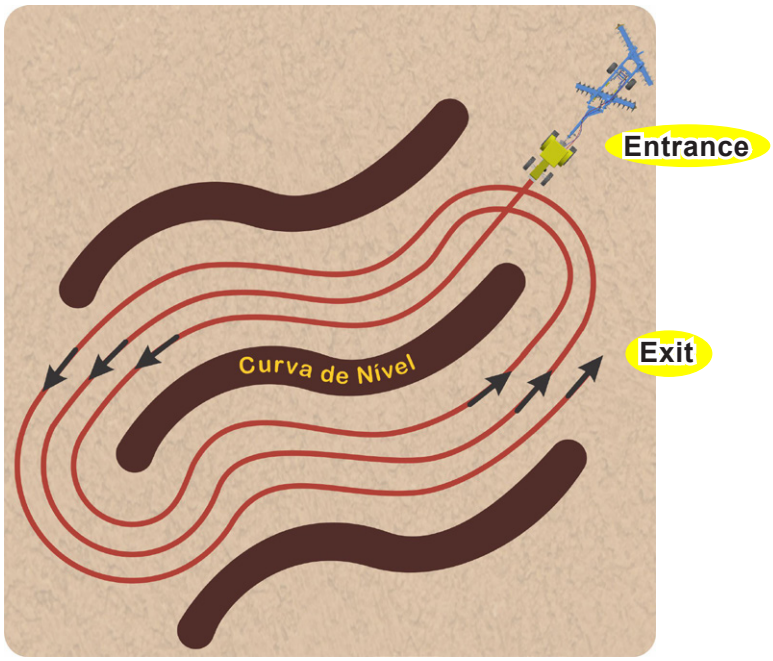
Regardless of the format and size of the field, the harrowing is made basically in two ways: from outside to inside or from inside to outside.



Harrowing in squares from outside to inside



Harrowing in squares from inside to outside



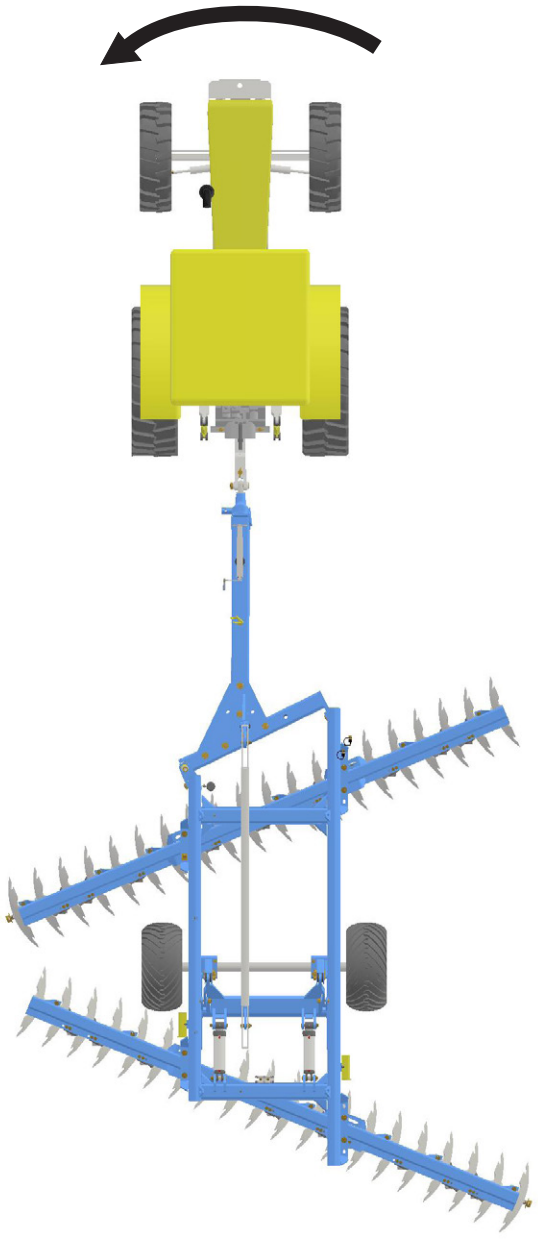
Harrowing in level

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

Being the disc gangs lowered, only maneuver to the left hand side.

Direction of the maneuvers

These disk harrows provide several working angles to operate properly in all types of soil. However, they require certain care during operations, like never make maneuvers to the right hand side, because the angle formed on its vertex transmits great effort to the equipment, overloading traction components such as the hitch bar, drawbar and other fixation parts.



ATTENTION **It is necessary to perform the maneuvers in the left hand side to avoid overloading the equipment and allow it to operate normally. Following these instructions also avoids the undesirable formation of large furrows in the local maneuvers.**

Troubleshooting guide

PROBLEM	CAUSES	POSSIBLE SOLUTIONS
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.
Locked disc gangs.	Wet field.	Let the field dry out or penetrate the disc blade superficially to help the drying process.
	Deep penetration on wet soil.	Use the rod stops to decrease the depth. Lift the disc blade to reduce the penetration.
	Worn out / incorrectly adjusted scrapers.	Adjust or change the scrapers when necessary.
Quick couplers do not adapt.	Different type of quick couplers.	Use male and female quick couplers from the same type.
Hoses leaking with fixed terminals.	Insufficient tightening.	Retighten carefully.
	Lack of sealing material on the thread.	Use thread sealing tape and retighten carefully.
Hydraulic cylinder leaking.	Damaged repairings.	Replace the repairings.
	Damaged rod.	Replace the rod.
	Oil with impurities.	Replace the oil, repairings and filter elements.
	Working pressure superior than the recommended one.	Adjust the control valve using the relief valve with the aid of a pressure gauge. Normal pressure: 180 Kgf/cm^2.
Quick couplers leaking.	Insufficient tightening.	Retighten carefully.
	Lack of sealing material on the thread.	Use thread sealing tape and retighten carefully.
	Damaged repairings.	Replace the repairings.

Operations - important points

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

Operations - important points

- To carry out any verification on the equipment, lower it to the ground and shut down the tractor engine.
- Whenever unhitching the equipment, do it on a flat and firm place and use the jacks.
- Carry out the operations on a controlled and careful manner.
- Before maneuvering at the edge of the field, activate the hydraulic cylinder gradually to lift the disc gangs.
- During working, do not maneuver without totally lifting the disk harrow as the angle formed by the disc gangs could require a great effort from the equipment, what would overload the traction components.
- Relieve the control valve pressure before disconnecting the quick couplers and when doing any verification in the hydraulic circuit or on the retention valve.
- Do not check eventual leaks using your bare hands, as the high pressure may cause body injury. Use a cardboard or any other suitable object.
- As previously mentioned, these disk harrows have several settings. However, only the local conditions can determine their best adjustment.

Lubrication

To reduce the wear caused by the friction caused by the moving parts of the equipment, it is necessary to carry out a proper lubrication, as indicated below:

1) Every 24 hours of service, lubricate every grease fitting.

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

• Remove the remainder old grease around the articulations.

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

• Introduce enough amount of new grease.

• Use medium consistency grease.

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

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

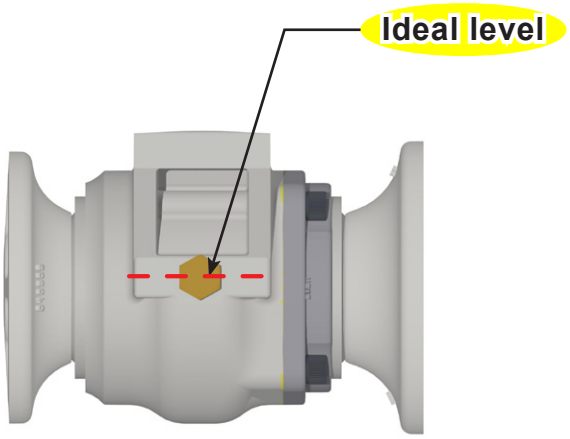
• In a flat place, check the oil level of each bearing before using the disk harrow for the first time and every day of the first week.

• Then, start to check weekly.

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

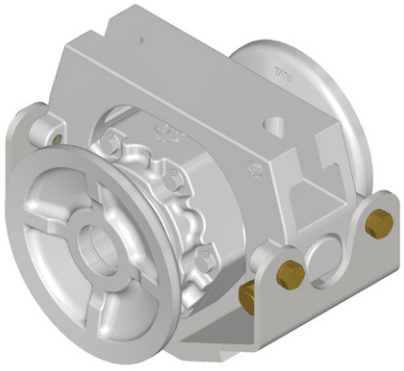
• Use SAE 90 mineral oil only.

2.2) DMO bearings do not need maintenance.



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

The oil volume on the DM bearings is 190 ml (except for the ATCRL model, which volume is 110 ml).

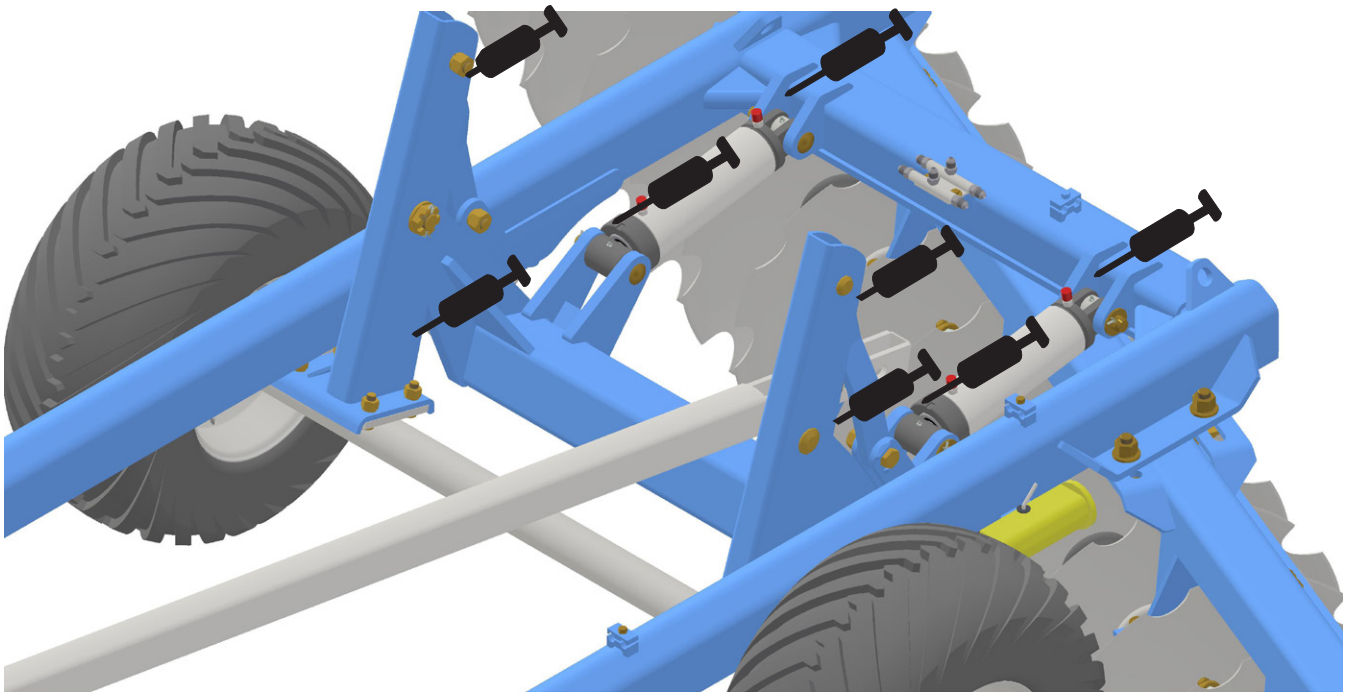


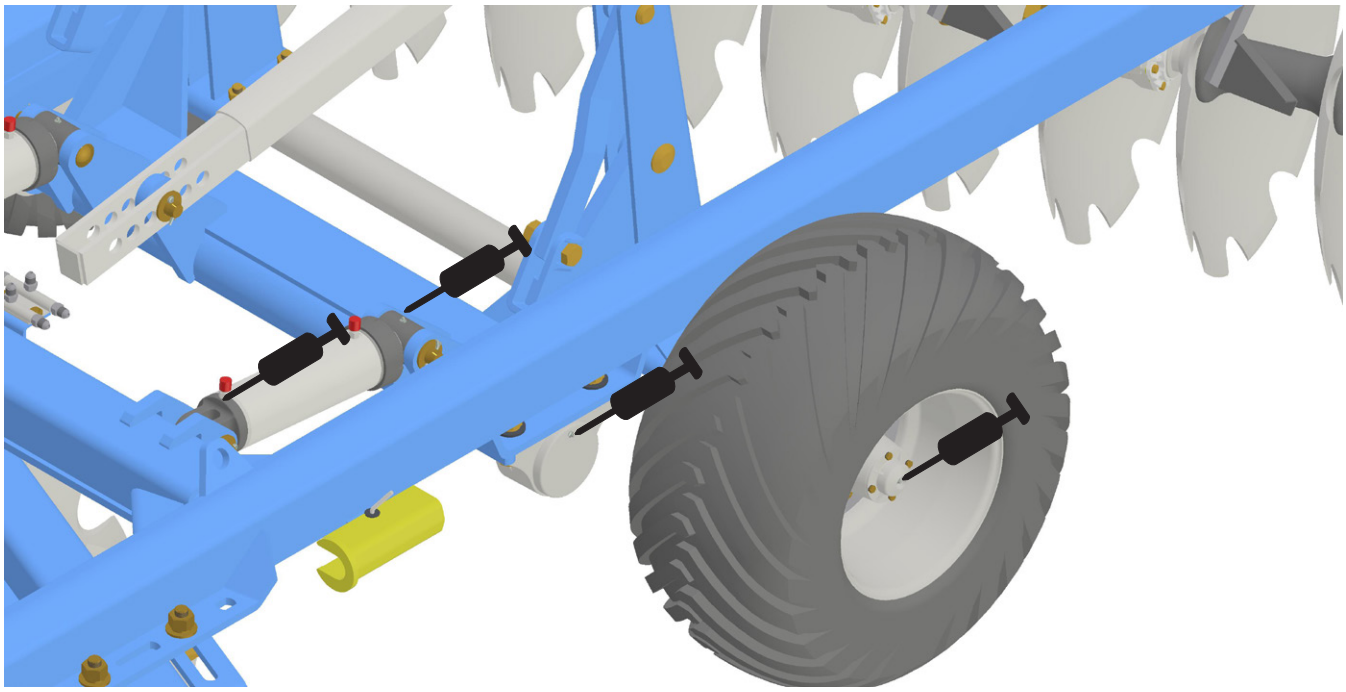
NOTE **Duromark steel-plated bearing.**

Assembled with a high-performance lubricant, the Duromark steel-plated bearing do not have a plug since there is no need to refill it, avoiding the risk of mixing incompatible lubricants.

Lubrication points

Lubricate every 24 hours of service.





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

Wheel support hubs lubrication

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

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

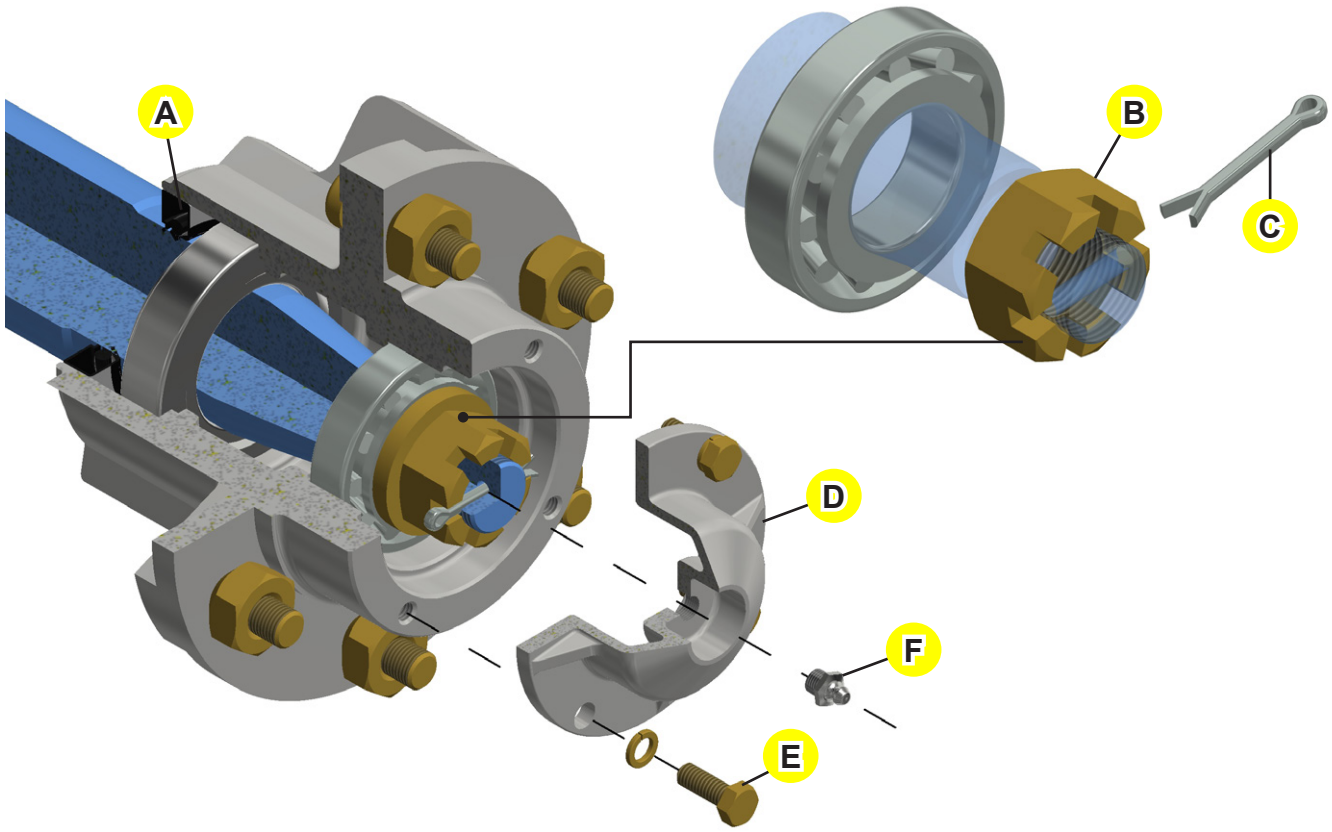
Check the existence of clearances and the condition of the bearings and retainers. Replace any damaged component or with excessive wear.

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 work, 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.

Hydraulic cylinder maintenance

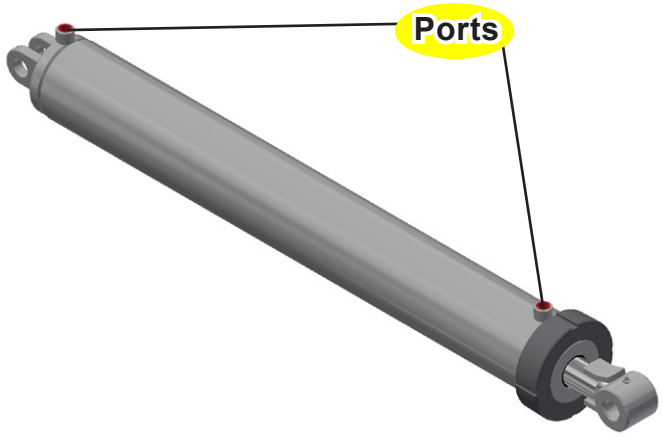
When cylinder repair is required, clean off unit, disconnect hoses and plug ports before removing cylinder.

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

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

You may require the following tools:

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



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

Disassembly:

1) Remove the end cap (A);

2) Carefully remove inner assemblies (B);

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

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

5) Remove seals and inspect all parts for damage;

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

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

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

Hydraulic cylinder assembly

Reassembly:

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

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

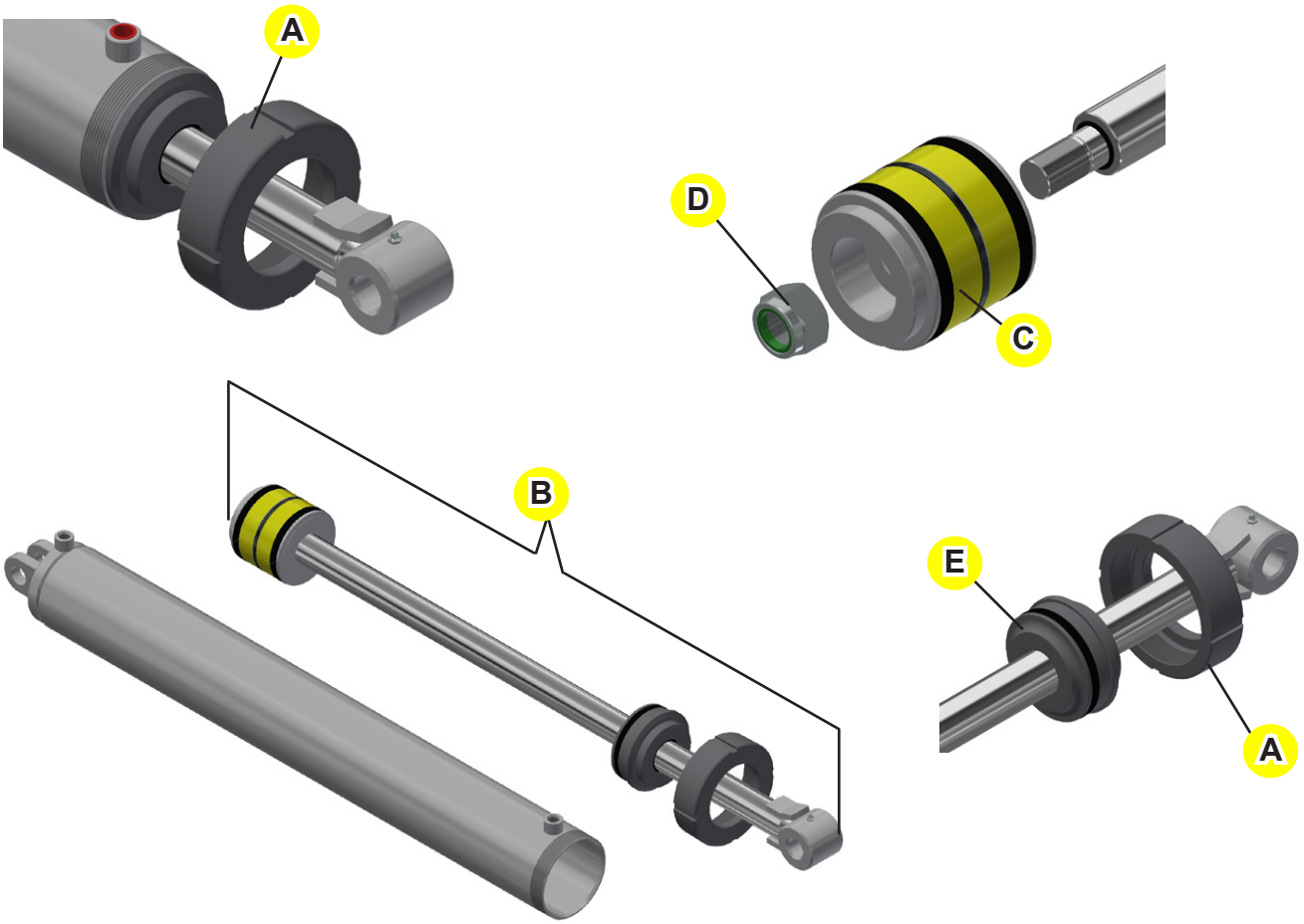
3) Lube inside of barrel, piston seals, and gland seals with hydraulic oil;

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

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

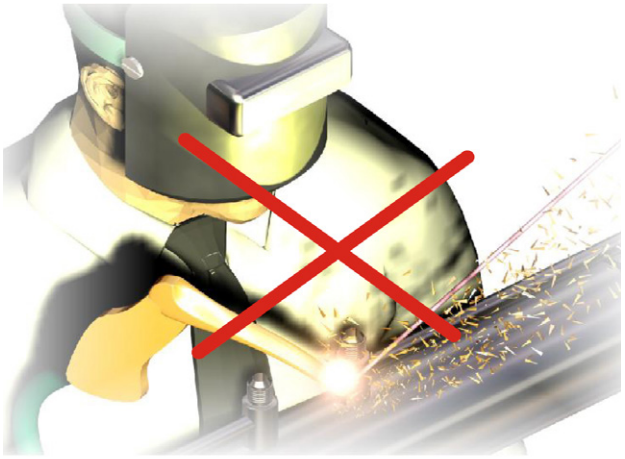
6) Torque cylinder end cap (A) to **400 lb.ft** (**600 N.m**).

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



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

Hydraulic safety



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

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

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

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

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

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

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

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

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

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

Disk harrow maintenance

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

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

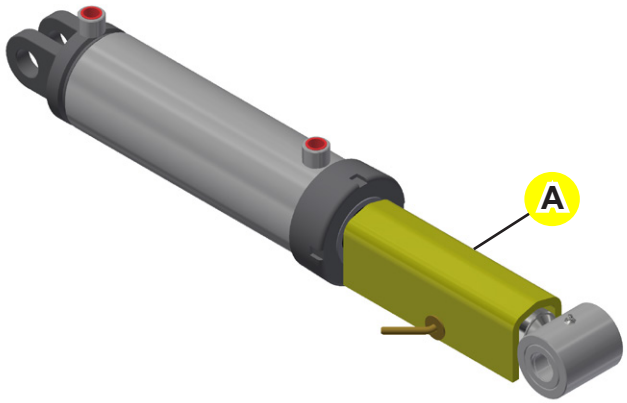
• After 24 hours of service, the bolts on the disk harrow must be checked to see if they are properly tightened. To assure a great performance and avoid wear and rupture, these bolts must be tightened every so often.

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

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

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

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



NOTE **Use TATU original parts only.**

Tires inflation

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

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

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

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

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

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

6 x 16 - 6 ply ..... (52 PSI)

7.50 x 16 - 10 ply ..... (60 PSI)

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

11L15 tires - 10 ply ..... (44 PSI)

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

Hourly income calculation

To calculate the hourly income of the equipment, use the following calculation:

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

Where:

R = Hourly income;

L = Disk harrow working width (meters);

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

E = Efficiency: 0.90;

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

Example using an ATCR disk harrow with 20 disc blades:

R = ?

L = 2.19 m

V = 6,000 m/h

E = 0.90

X = 10,000 m^2

$$R = \frac{2.19 \times 6{,}000 \times 0.90}{10{,}000}$$

R = The hourly income using an ATCR with 20 disc blades will be approximately of 1.18 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 (m)	Hourly income (ha)	Daily incme (ha)
ATCR	12	1.27	0.69	6.17
	14	1.50	0.81	7.29
	16	1.73	0.93	8.41
	18	1.96	1.06	9.53
	20	2.19	1.18	10.64
	22	2.42	1.31	11.76
	23	2.53	1.37	12.30
	24	2.65	1.43	12.88
	25	2.76	1.49	13.41
	26	2.88	1.56	14.00
	28	3.11	1.68	15.11
	29	3.22	1.74	15.65
	32	3.57	1.93	17.35
	36	4.03	2.18	19.59
	40	4.49	2.42	21.82
	44	4.95	2.67	24.06

Model	Number of disc blades	Cutting width (m)	Hourly income (ha)	Daily income (ha)
ATCRL	14	1.50	0.81	7.29
	16	1.73	0.93	8.41
	18	1.96	1.06	9.53
	19	2.07	1.12	10.06
	20	2.19	1.18	10.64
	21	2.30	1.24	11.18
	22	2.42	1.31	11.76
	23	2.53	1.37	12.30
	24	2.65	1.43	12.88
	25	2.77	1.50	13.46
	26	2.89	1.56	14.05
	28	3.11	1.68	15.11
	29	3.22	1.74	15.65
	32	3.57	1.93	17.35
	33	3.67	1.98	17.84
	36	4.03	2.18	19.59
	37	4.14	2.24	20.12

Average income table

Model	Number of disc blades	Cutting width (m)	Hourly income (ha)	Daily income (ha)
GAICR	12	1.60	0.86	7.78
	14	1.75	0.95	8.51
	16	2.00	1.08	9.72
	18	2.30	1.24	11.18
	20	2.57	1.39	12.49
	22	2.84	1.53	13.80
	24	3.11	1.68	15.11
	25	3.25	1.76	15.80
	26	3.38	1.83	16.43
	28	3.65	1.97	17.74
	29	3.78	2.04	18.37
	30	3.92	2.12	19.05
	32	4.18	2.26	20.31
	36	4.72	2.55	22.94
	40	5.25	2.84	25.52
	44	5.44	2.94	26.44
	48	6.23	3.36	30.28

Model	Number of disc blades	Cutting width (m)	Hourly income (ha)	Daily income (ha)
GAICR 300	12	1.65	0.89	8.02
	14	1.90	1.03	9.23
	16	2.18	1.18	10.59
	18	2.40	1.30	11.66
	20	2.73	1.47	13.27
	22	3.01	1.63	14.63
	24	3.28	1.77	15.94
	26	3.56	1.92	17.30
	28	3.84	2.07	18.66
	30	4.12	2.22	20.02

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

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

Example: An area of 50 hectares to be worked using an ATCR with 20 disc blades. (Hourly income = 1.18 ha).

So: $\frac{50}{1.18} = 42.37$

Approximately will be spent 42 (forty-two) hours to work in an area of 50 hectares.

Torque table

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

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TORQUE TABLE

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Bolt Size (Inches) (a)	Grade 2		Grade 5		Grade 8	
	Lbs-ft (b)	N.m (c)	Lbs-ft	N.m	Lbs-ft	N.m
1/4" - 20	5,5	7,5	8,5	11,5	12	16,3
1/4" - 28	6	8,1	9,5	12,9	14	19,0
5/16" - 18	10,5	14,2	17,5	23,7	24,5	33,2
5/16" - 24	12	16,3	19,5	26,4	27,5	37,3
3/8" - 16	19,5	26,4	31,5	42,7	44	59,7
3/8" - 24	22	29,8	35	47,5	50	67,8
7/16" - 14	31	42,0	50	67,8	70,5	95,6
7/16" - 14	34,5	46,8	56	75,9	79	107,1
1/2" - 13	47	63,7	76	103,1	107,5	145,8
1/2" - 20	53,5	72,5	86	116,6	121,5	164,8
9/16" - 12	68	92,2	110	149,2	155	210,2
9/16" - 18	76	103,1	122,5	166,1	173	234,6
5/8" - 11	94	127,5	151,5	205,4	214,5	290,9
5/8" - 18	106,5	144,4	171,5	232,6	242,5	328,8
3/4" - 10	167	226,5	269,5	365,4	380,5	516,0
3/4" - 16	186	252,2	300	406,8	424,5	575,6
7/8" - 9	169,5	229,8	434	588,5	612,5	830,6
7/8" - 14	187	253,6	478,5	648,8	676,5	917,3
1" - 8	254,5	345,1	650	881,4	918,5	1.245,5
1" - 12	285,5	387,1	729,5	989,2	1031	1.398,0
1.1/8" - 7	360,5	488,8	921,5	1.249,6	1302	1.765,5
1.1/8" - 12	404,5	548,5	1033,5	1.401,4	1460	1.979,8
1.1/4" - 7	508,5	689,5	1300	1.762,8	1837,5	2.491,7
1.1/4" - 12	563,5	764,1	1439,5	1.952,0	2034,5	2.758,8
1.3/8" - 6	667	904,5	1704,5	2.311,3	2408	3.265,2
1.3/8" - 12	759,5	1.029,9	1940	2.630,6	2741,5	3.717,5
1.1/2" - 6	885,5	1.200,7	2262,5	3.068,0	3197	4.335,1
1.1/2" - 12	996	1.350,6	2545,5	3.451,7	3597	4.877,5

Bolt Size (Metric) (D)	4.6		8.8		10.9	
	Lbs-ft	N.m	Lbs-ft	N.m	Lbs-ft	N.m
M5 x 0.8	2,5	3,39	5	6,78	8,5	11,526
M 6 x 1	3	4,068	8	10,85	11,5	15,594
M 6 x 0.75	3,5	4,746	8,5	11,53	13	17,628
M 8 x 1.25	7	9,492	19,5	26,44	28	37,968
M 8 x 1	8	10,848	21	28,48	30,5	41,358
M 10 x 1.5	14	18,984	38,5	52,21	56	75,936
M 10 x 1	16	21,696	43	58,31	63	85,428
M 12 x 1.75	25	33,9	66,5	90,17	98	132,888
M 12 x 1.25	27	36,612	73	98,99	107,5	145,77
M 14 x 2	40	54,24	107	145,09	156,5	212,214
M 14 x 1.5	43	58,308	115,5	156,62	169	229,164
M 16 x 2	62	84,072	165,5	224,42	243,5	330,186
M 16 x 1.5	66,5	90,174	177	240,01	260	352,56
M 18 x 2.5	86	116,616	229	310,52	336	455,616
M 18 x 1.5	96,5	130,854	257	348,49	378	512,568
M 20 x 2.5	121,5	164,754	323,5	438,67	475	644,1
M 20 x 1.5	134,5	182,382	359	486,80	527	714,612
M 22 x 2.5	165,5	224,418	441	598,00	647,5	878,01
M 22 x 1.5	182	246,792	484	656,30	711,5	964,794
M 24 x 3	210	284,76	559	758,00	821	1113,276
M 24 x 1.5	238,5	323,406	636	862,42	933,5	1265,826
M 27 x 3	307	416,292	820	1111,92	1204	1632,624
M 27 x 1.5	344	466,464	918	1244,81	1348,5	1828,566
M 30 x 3.5	416,5	564,774	1111,5	1507,19	1632,5	2213,67
M 30 x 1.5	477,5	647,49	1273	1726,19	1870	2535,72
M 33 x 3.5	567	768,852	1512,5	2050,95	2221,5	3012,354
M 33 x 1.5	641,5	869,874	1709,5	2318,08	2511	3404,916
M 36 x 4	729	988,524	1943	2634,71	2854	3870,024
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

a) Nominal thread diameter in inches-threads per inch
b) Foot pounds
c) Newton-meters
d) Nominal thread diameter in millimeters x thread pitch

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

Important

ATTENTION

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

Images are for illustration purposes only.

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

TECHNICAL PUBLICATION DIVISION

Elaboration / Diagramming: Káthia Regina Datorre

Technical information: Carlos Cezar Galhardi

Translation / Revision: Matheus Freire de Souza

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MARCHESAN IMPLEMENTOS E MÁQUINAS AGRÍCOLAS "TATU" S.A.
Marchesan Av., 1979 - Zip Code 15994-900 - Matão - SP - Brazil
Telephone 55.16.3382.8282
www.marchesan.com.br

Notes

⚠ 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 à toxidade dos gases expelidos.

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

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

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

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

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

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

11 - Não efetue regulagens com o implemento em funcionamento.

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

13 - A velocidade de operação deve ser cuidadosamente controlada.

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

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

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

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

18 - Não transite em rodovias ou estradas pavimentadas.

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

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

⚠ ATENCION

- RECOMENDACIONES GENERALES DE SEGURIDAD -

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

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

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

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

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

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

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

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

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

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

11 - No efectuar regulajes con el equipo en funcionamiento.

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

13 - La velocidad de operación debe ser cuidadosamente controlada.

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

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

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

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

18 - No transitar en carreteras o caminos pavimentados.

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

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

⚠ ATTENTION

- GENERAL RECOMMENDATION ABOUT SAFETY -

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

16 - Before making 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 are sharp and could cut hands, feet etc, even when they are not in operation. In other to avoid serious accidents, use chock blocks to prevent the gang assembly from rolling surfaces before assembly to the frame. Wear gloves when handling the blades or gang assemblies.

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

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

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