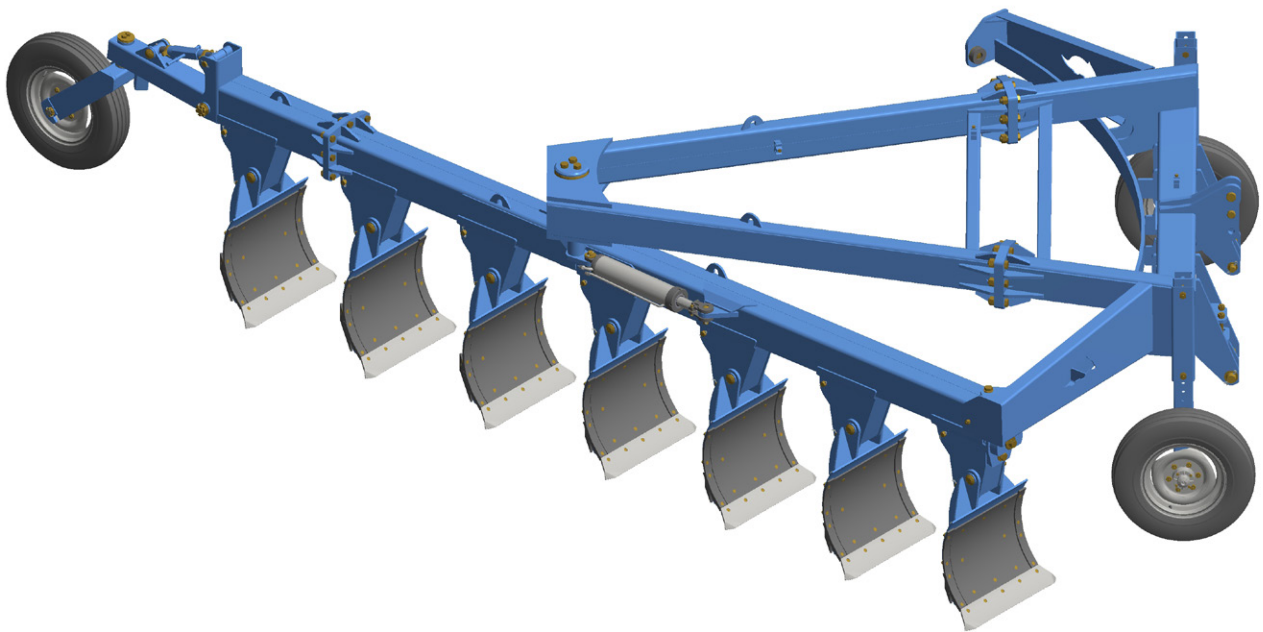


MARCHESAN

OPERATOR'S MANUAL



AARP

Introduction

The AARP plow has a modern and rugged structure with a better weight distribution. This equipment allow operations with the tractor over unworked ground, far from the furrow. It can be normally used on tractors with dual wheelset.

Equipped moldboards with two cutting faces that provides excellent penetration, clod breaking and stubble incorporation.

The moldboards have a cylindrical shape with high capacity of land fragmentation and also have an automatic retrieving set that is activated by an elastic deformation of the flat spring, returning the moldboards to working position instantly, being just necessary to lift the equipment.

Special coating with high density polyethylene that reduces the effort and the friction with the ground and also has a superior wear resistance.

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 plow.



Table of contents

1. To the owner	3
2. To the operator	4 to 9
3. Data sheet	10 & 11
Dimensions for transportation and storage	11
4. Components	12
5. Assembly	13 to 18
Frame assembly	13
Moldboard carrier frame and shock absorbers	14
Moldboard assembly	15
Adapter to change the number of moldboards assembly	16
Wheelset fixation support assembly	16
Wheelset and rear tire assembly	17
Front tires assembly / Hoses and cylinder assembly	18
6. Set-up instructions	19
Preparing the tractor / Quick coupling (Hanger type)	19
7. Adjustments and operations	20 to 25
Plow leveling	20
Depth adjustment of the moldboard	21
Automatic retrieving and pressure adjustment	22
Important recommendations / Plow operations	23
Ways to start the plowing / Troubleshooting guide	24
Operations - Important points	25
8. Maintenance	26 to 33
Lubrication / Lubrication points	26
Replacement of the blades and polyethylene plates	27
Wheelset hubs lubrication	28
Hydraulic cylinder maintenance / assembly	29 & 30
Plow maintenance	31
Tires inflation	32
Hydraulic safety	33
9. Important data	34 to 36
Calculation of hourly income	34
Average income table	35
Torque table	36
10. Important	37

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



NOTE

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

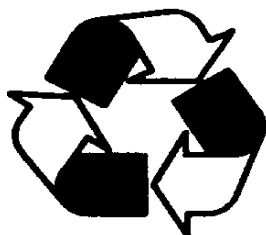
To the operator

Be careful with the environment



Dear operator!

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



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

Working safely



- **Security aspects must be carefully observed to avoid accidents.**
- **This symbol is a warning to prevent accidents.**
- **The instructions under this symbol refers to the safety of the operator, mechanic or third parties, therefore they should be carefully read and observed. When the safety instructions are not being followed, a serious accident or even death may occur.**

The AARP plow is simple to operate, requiring however the basic and essential cautions to its handling.

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



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



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

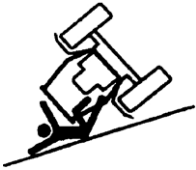
To the operator



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



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



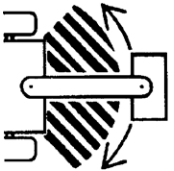
Be careful while driving on slopes. Risk of overturn.



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



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



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



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



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



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



Always use the safety locks to carry out maintenance operations and to transport the equipment.

To the operator



- Only trained and qualified personnel are allowed to operate the equipment.
- While working or during transportation, only the presence of the operator is allowed on the tractor.
- Do not allow children to play or to get over the equipment, while it is operating, during transportation or storage.
- 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 plow 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 parking 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



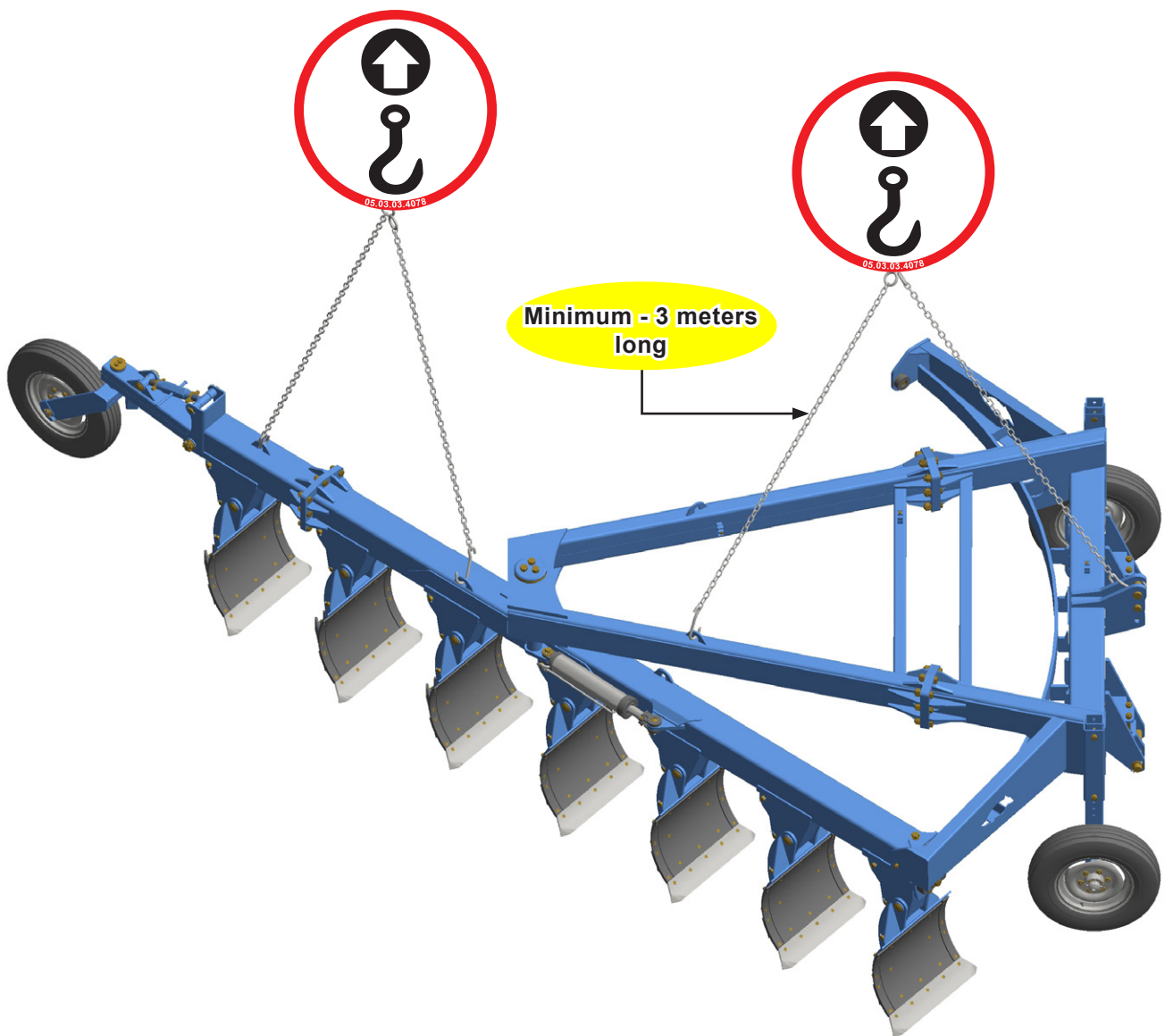
Marchesan does not advise the equipment traffic on highways, because this practice involves serious security risks in addition to being prohibited by the current existing traffic law. The transportation for long distances should be done on truck, trailer or other by following these safety guidelines:

- Use adequate ramps to load or unload the equipment. Do not make the loading on ditch banks, as it may 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 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 to the truck or trailer. If necessary use banners, lights and other devices in order to give adequate warning to the other drivers.

To the operator

Lifting points

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

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.



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

05.03.03.1827

Decal set

Qty.	Model	Serial number
1	AARP decal set	05.03.06.0798
1	Read the manual decal	05.03.03.1428
1	Lubricate and tighten daily decal	05.03.03.1827

Data sheet

AARP - On-land reversible moldboard plow

Type: Plow

Model: **AARP**

Spacing between moldboards: 810 mm

Number of moldboards: 05, 06, 07 and 08

Hitching type: Three-point hitch - Category II

Working speed: 5 to 8 km/h

Height: 950 mm

Tires: 6.00 x 16 - 6 ply

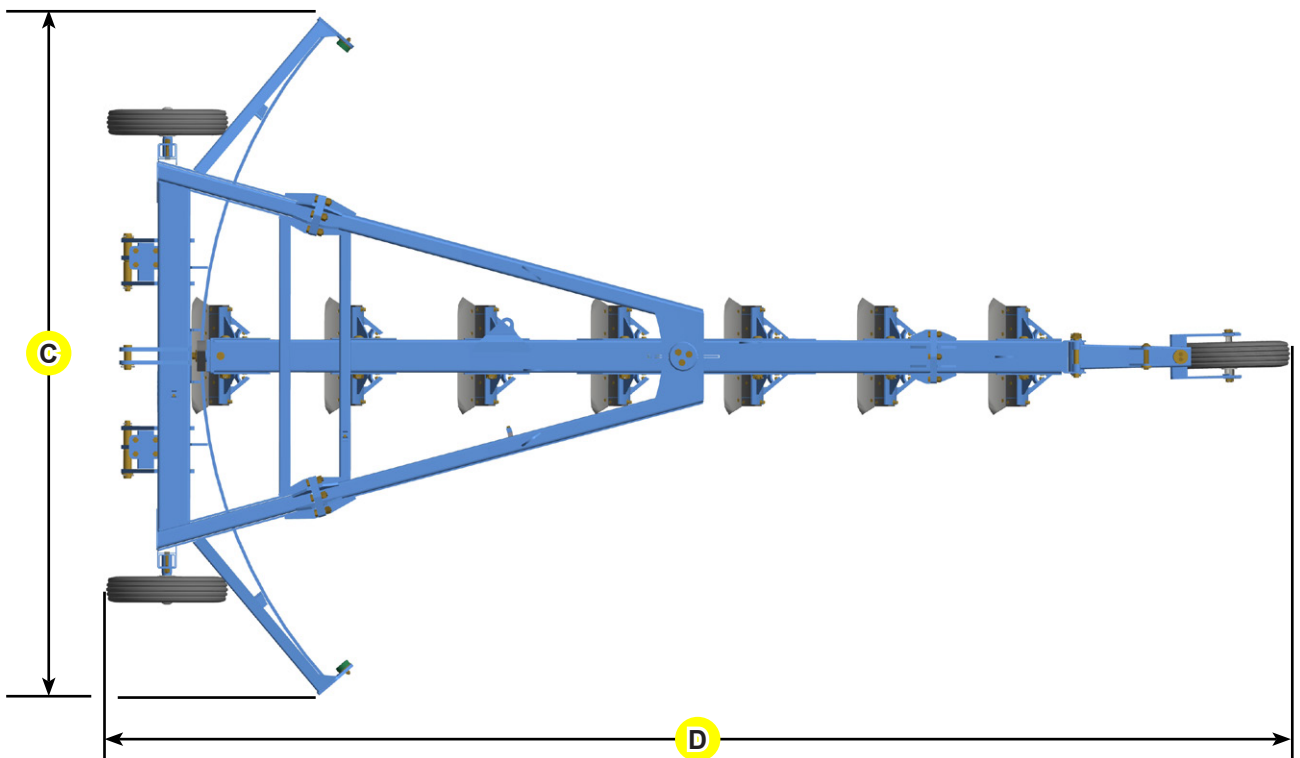
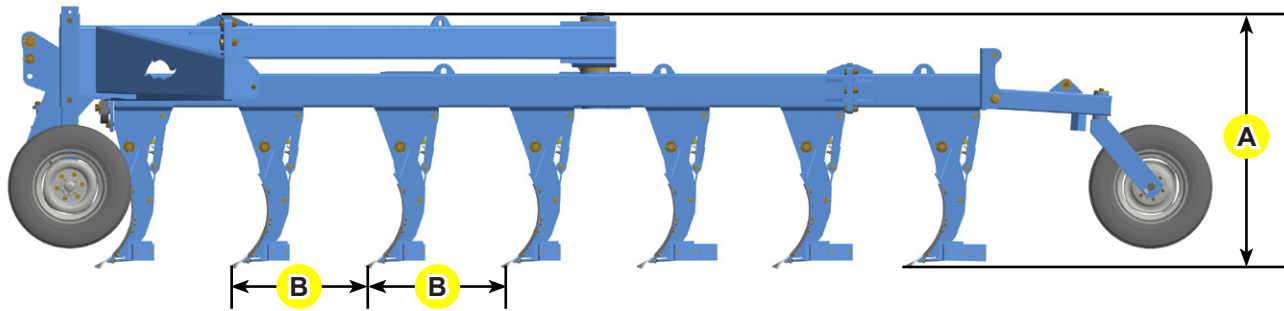
Model	Number of moldboards	Cutting width (mm)	Total weight (kg)	Tractor engine required power (hp)
AARP	05	2400	2335	220 - 240
	06	2880	2530	240 - 260
	07	3360	2820	260 - 300
	08	3840	3010	300 - 340

ATTENTION / The working speed of the plow may vary between 5 and 8 km/h, depending on conditions and soil type.

The tractor engine required power must be observed regarding depth, soil type and working speed.

Data sheet

Dimensions for transportation and storage



Model	Number of moldboards	A	B	C	D
AARP	05	1510	810	4100	5940
	06	1510	810	4100	6420
	07	1510	810	4100	7130
	08	1510	810	4100	8040

NOTE Measures in millimeters.

Components

AARP - On-land reversible moldboard plow

01 - Frame

02 - Drawbar

03 - Hydraulic cylinder

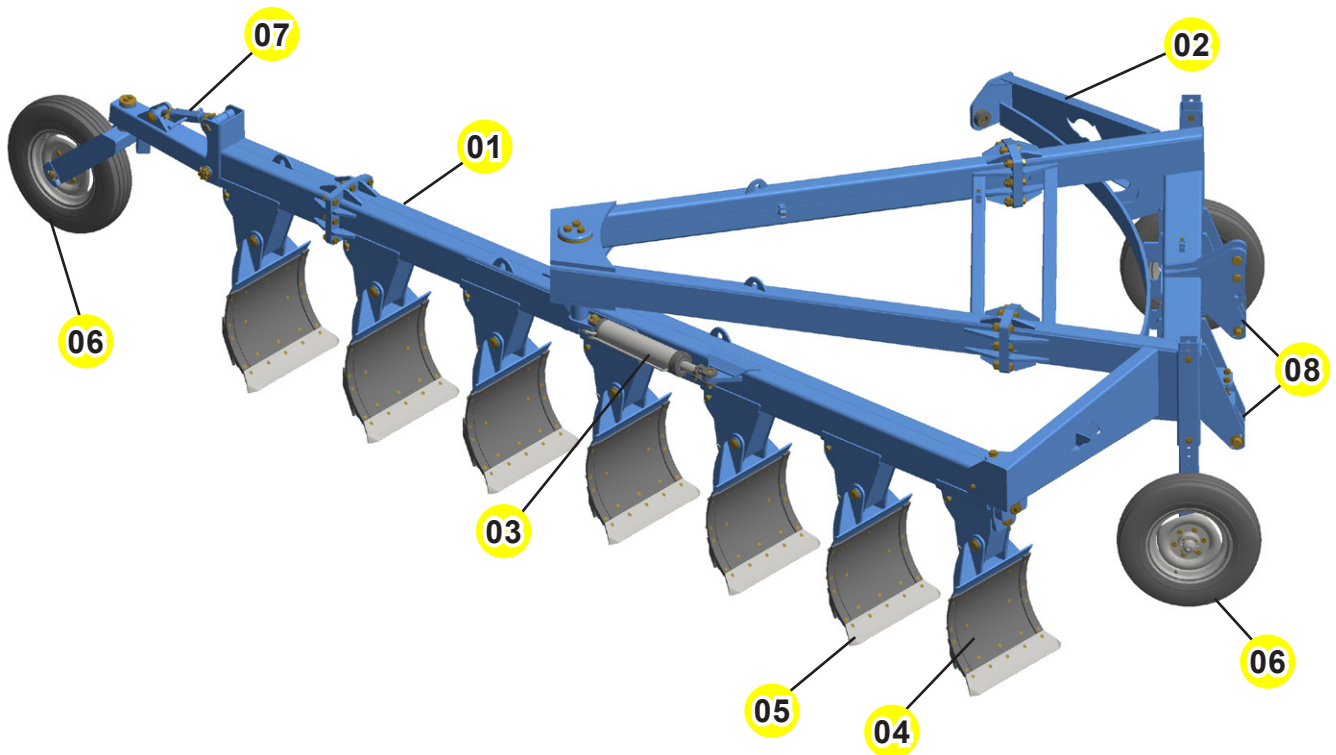
04 - Polyethylene plates

05 - Moldboards

06 - Gauge wheels

07 - Stabilizer

08 - Tractor hitch

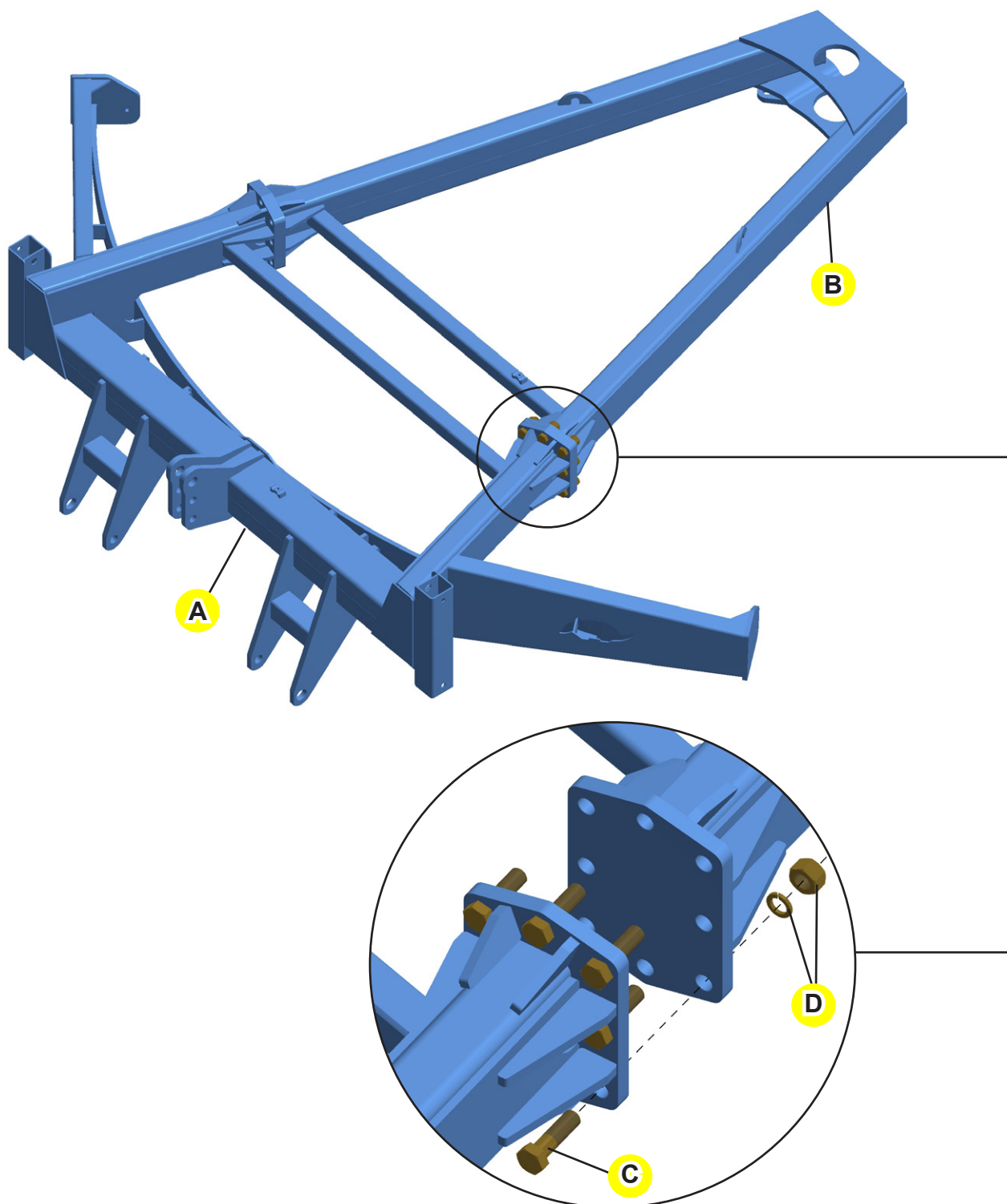


Assembly

The plow usually leaves the factory assembled, but to facilitate loading and transportation, the plow may leave unassembled in some cases. Follow the instructions below for the correct way to assemble your plow:

Frame assembly

Connect the front part of the frame (A) to its rear part (B) using bolts (C), spring washers and nuts (D), as detailed below.



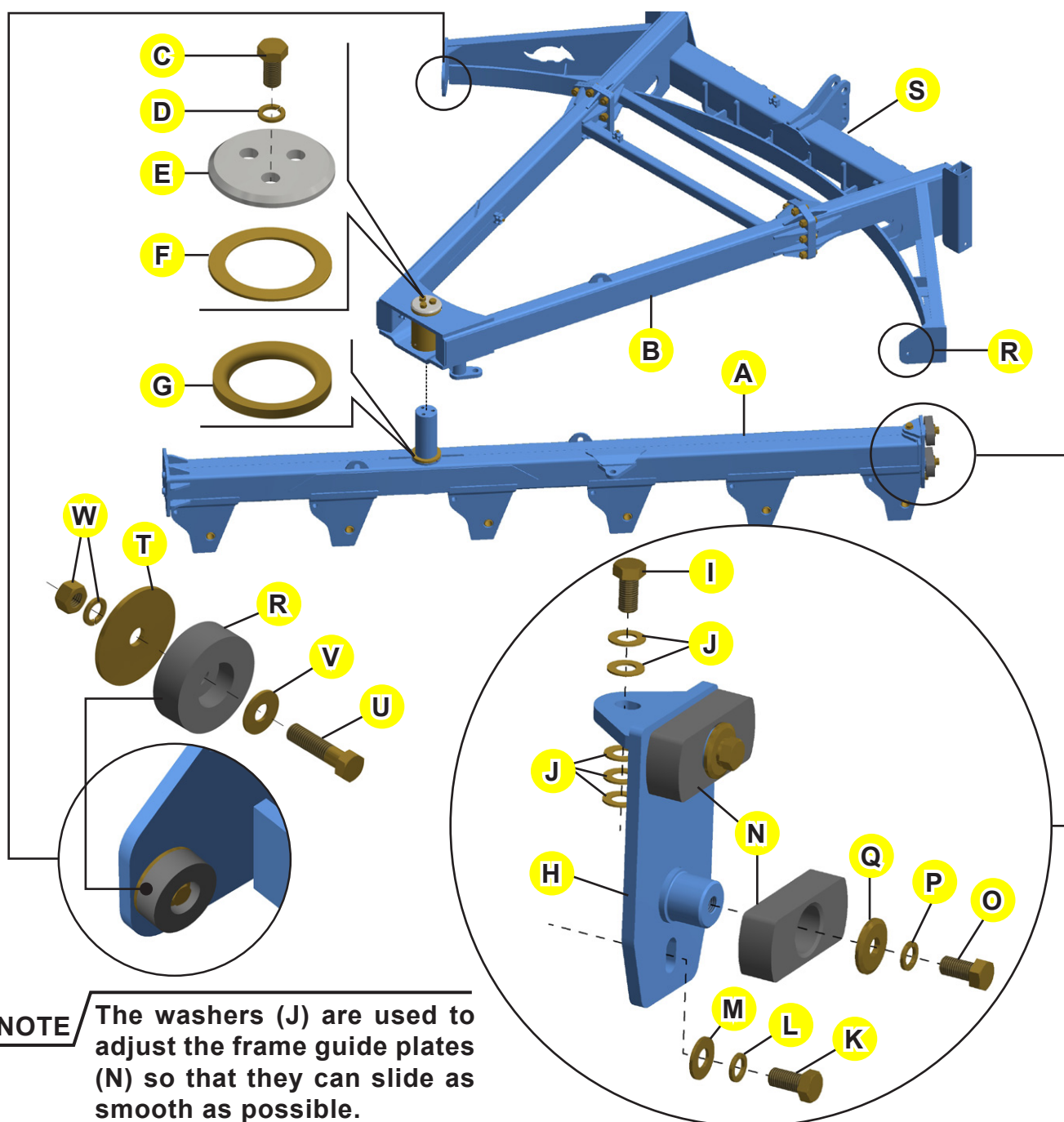
Assembly

Moldboard carrier frame and shock absorbers

Assemble the moldboard carrier frame (A) on the rear part of the drawbar (B) using bolts (C), spring washers (D), upper frame fixation flange (E), flat washer (F) and axle bushing (G).

Place the guide fastener (H) on the moldboard carrier frame using a bolt (I) and flat washers (J) on the upper part; on the lateral, use a bolt (K), spring washer (L) and flat washer (M). Place the frame guide plates (N) on the fastener using bolts (O), spring washers (P) and flat washers (Q), as shown below.

Fasten the lateral shock absorbers (R) to the front frame (S) with a flat washer (T) using a bolt (U), flat washer (V), spring washer and nut (W).



NOTE The washers (J) are used to adjust the frame guide plates (N) so that they can slide as smooth as possible.

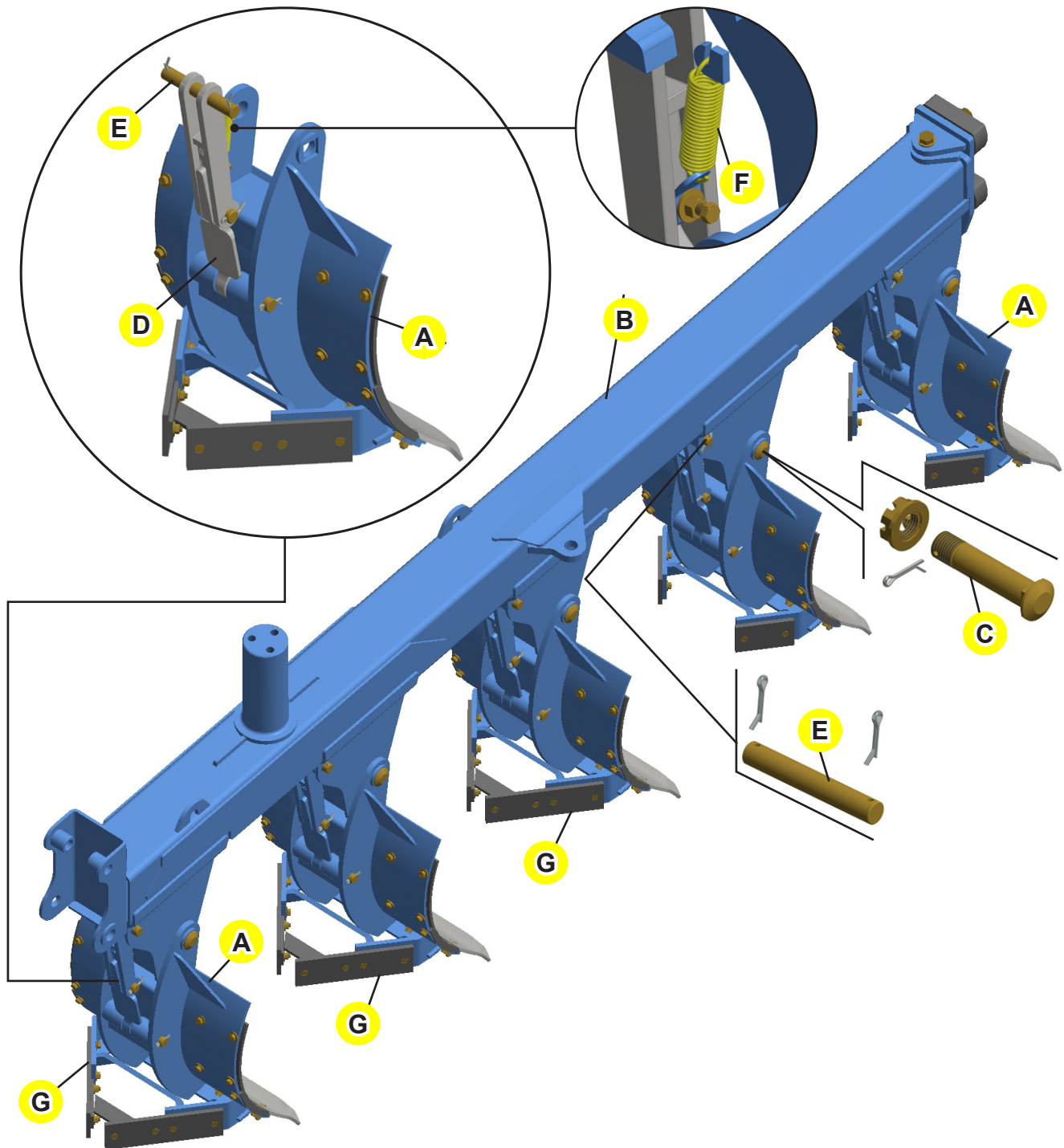
Assembly

Moldboard assembly

Couple the moldboards (A) to the moldboard carrier frame (B) using a pin (C), castle nut and cotter pin.

Then, couple the automatic retrieving set (D) with junction axle (E) and cotter pin.

Lastly, lock the traction spring (F) to the automatic retrieving set (D). Repeat this operation for every moldboard.

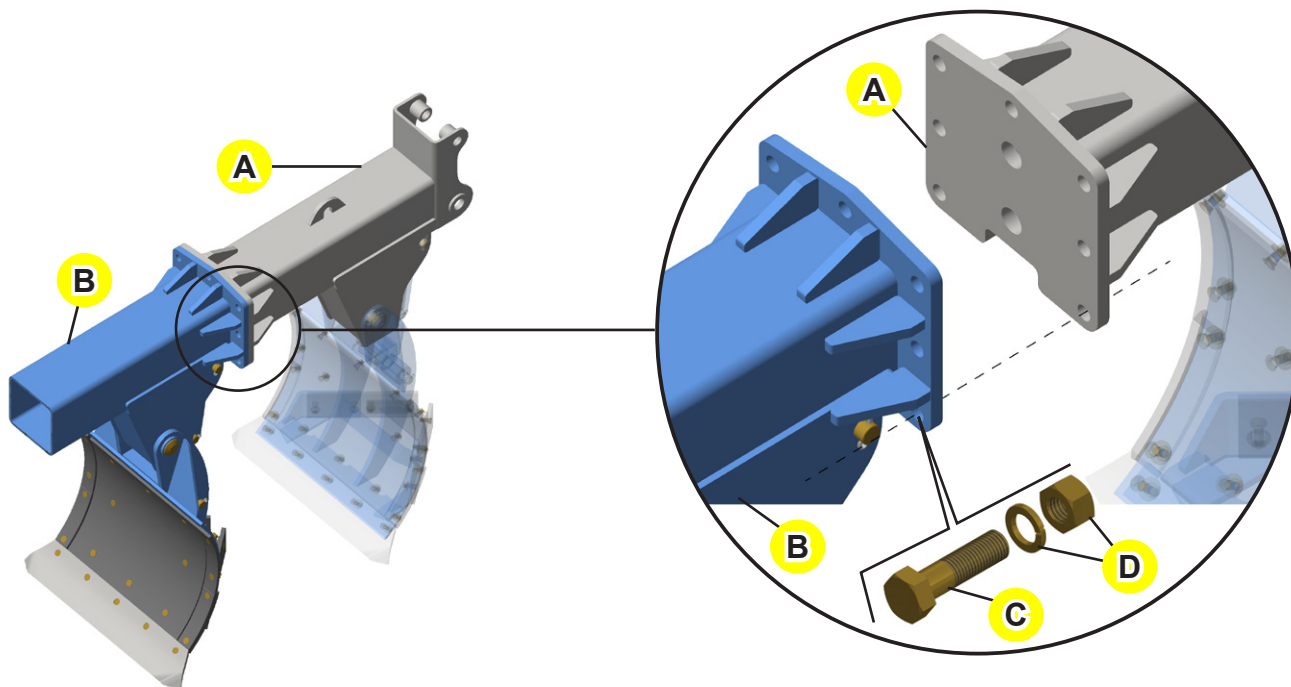


NOTE The three last moldboards have long guides (G) to help stabilizing the plow.

Assembly

Adapter to change the number of moldboards assembly

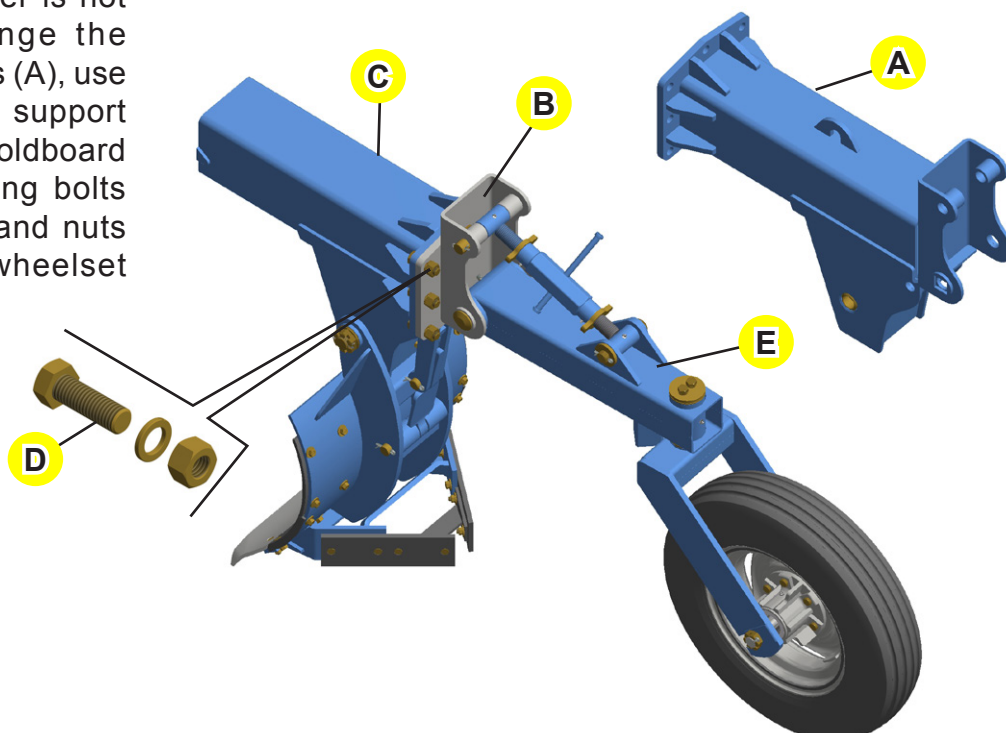
To add a moldboard on some equipment models, use the adapter (A), which must be fastened to the moldboard carrier frame (B) using bolts (C), spring washers and nuts (D).



NOTE The adapter (A) is an optional part for the 6/5, 7/6 and 8/7 models.

Wheelset fixation support assembly

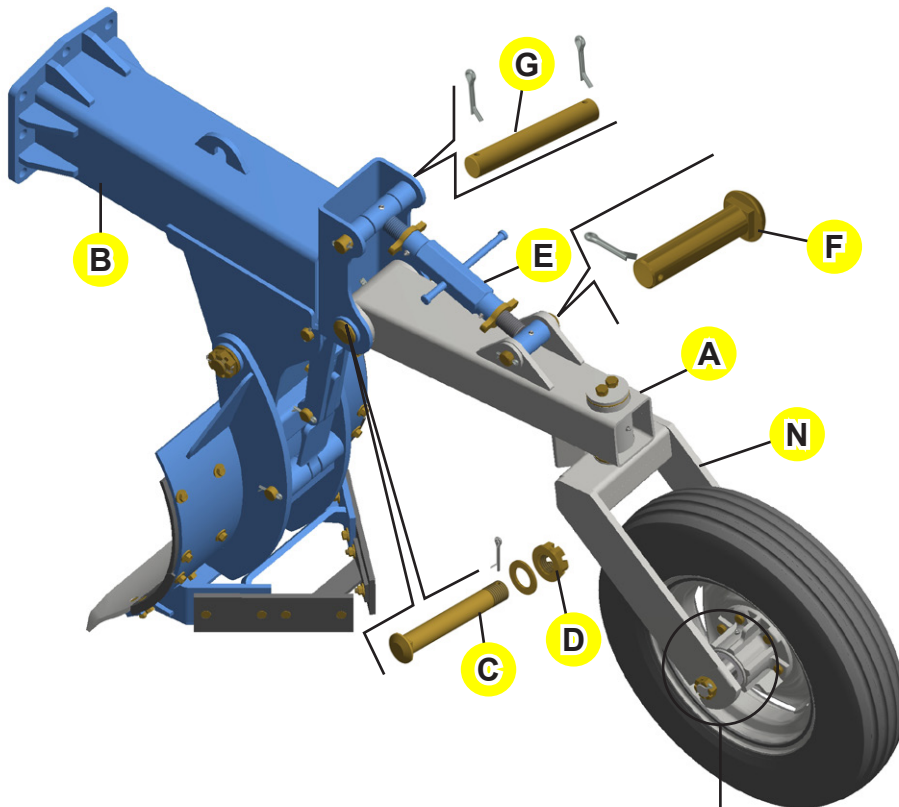
When the adapter is not being used to change the number of moldboards (A), use the wheelset fixation support (B), fastened to the moldboard carrier frame (C) using bolts (D), spring washers and nuts to couple the rear wheelset (E).



Assembly

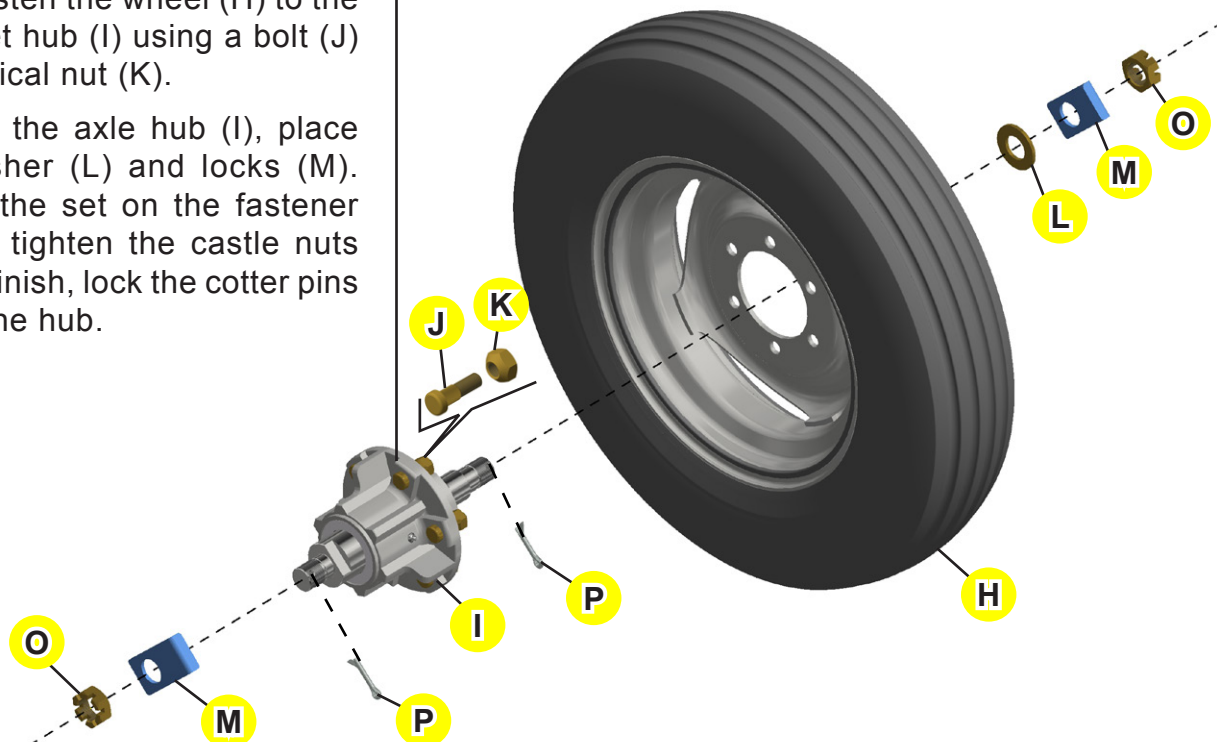
Wheelset and rear tire assembly

To couple the rear wheelset (A), fasten it to the moldboard carrier frame (B) using a junction axle (C), castle nut (D), flat washer and cotter pin. Place the stabilizer (E) to the wheelset (A) with junction axle (F) and cotter pin. On the other end, use the junction axle (G) and cotter pin.



Fasten the wheel (H) to the wheelset hub (I) using a bolt (J) and conical nut (K).

On the axle hub (I), place flat washer (L) and locks (M). Couple the set on the fastener (N) and tighten the castle nuts (O). To finish, lock the cotter pins (P) on the hub.

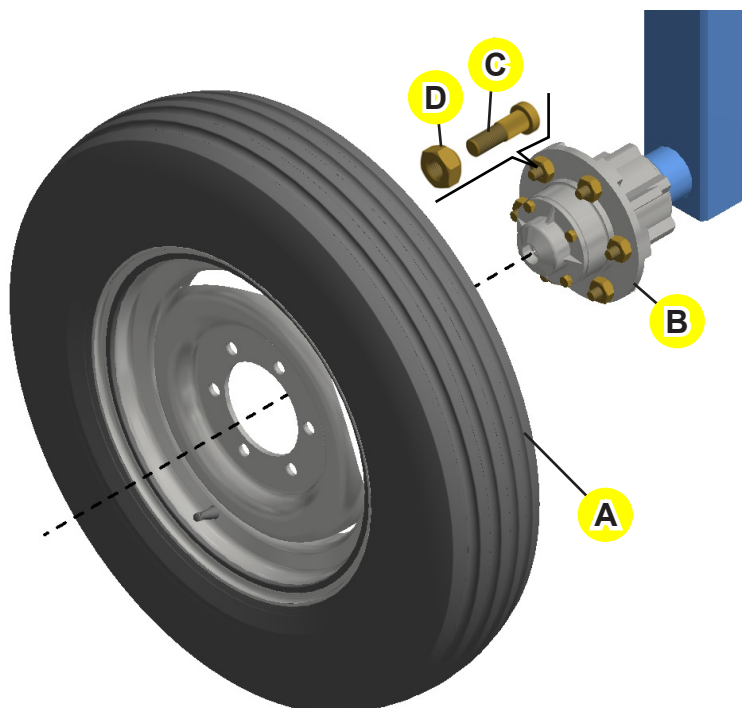


Assembly

Front tires assembly

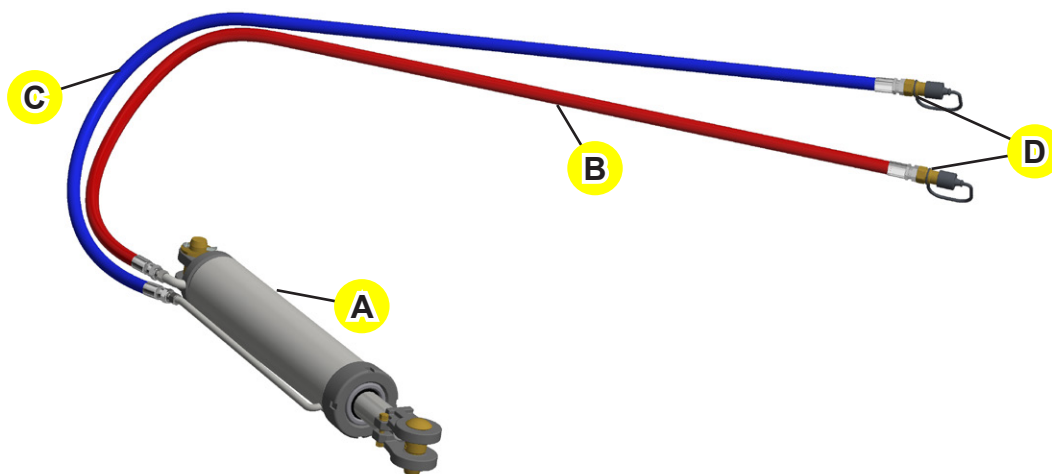
Fasten the wheel (A) to the wheelset arm hub (B) using a bolt (C) and conical nut (D).

Check how to assemble and unassemble the wheelset hub (B) for a correct lubrication on the 'maintenance' section (Wheelset hubs lubrication).



Hoses and cylinder assembly

Identify the hoses as shown on the illustration and also the specifications below:



AARP		
Item	Description	Quantity
A	Hydraulic cylinder	01
B	3/8 x 6000 TR-TM hose	01
C	3/8 x 6000 TR-TM hose	01
D	Male quick coupler with cap	02

NOTE Assemble the set with enough tightening to avoid leakages.
Always use thread sealing tape to couple the male quick couplers to the hoses.

Set-up instructions

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

Preparing the tractor

Check the general conditions for using the tractor, especially the good functioning of the hydraulic system (three-point hitch).

The addition of water ballasts on the tires or a set of weights on the front part/rear wheels of the tractor are the most used ways to increase the traction over soil and to give a greater stability to the tractor.



When transporting the plow or lifting it for maneuvers, check the tractor manual to be sure about the necessary weight to not affect the stability of the tractor-plow set. Without this proper weight distribution, serious accidents or even death may occur.

Marchesan is not responsible for the incorrect use of the equipment.

Quick coupling (hanger type)

The quick coupling (hanger type) (A) comes equipped to the tractor to facilitate and give greater security.

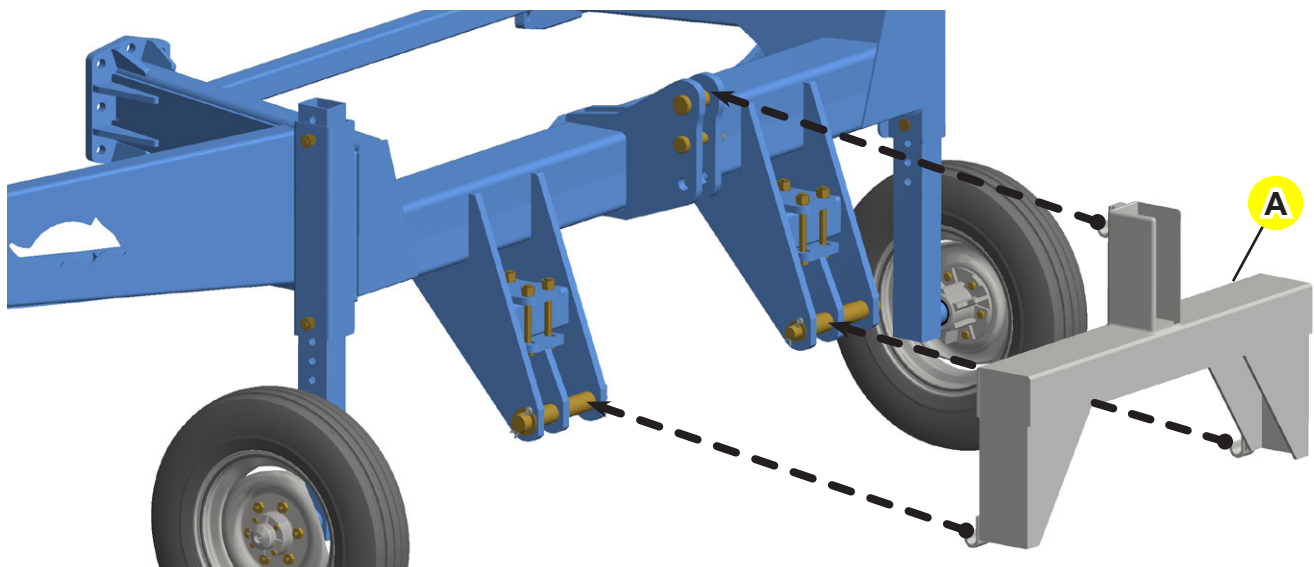
With the fast coupling, the operator can perform the plow hitching from the seat.

Choose a place as flat as possible for hitching.

Drive the tractor slowly in reverse gear in order to get closer to the plow and be ready to brake. After hitching, lift the plow until it clicks lock.

For a perfect coupling, the plow must be centralized with the tractor.

Align the tractor quick coupling with the plow drawbar.



Adjustments and operations

Plow leveling

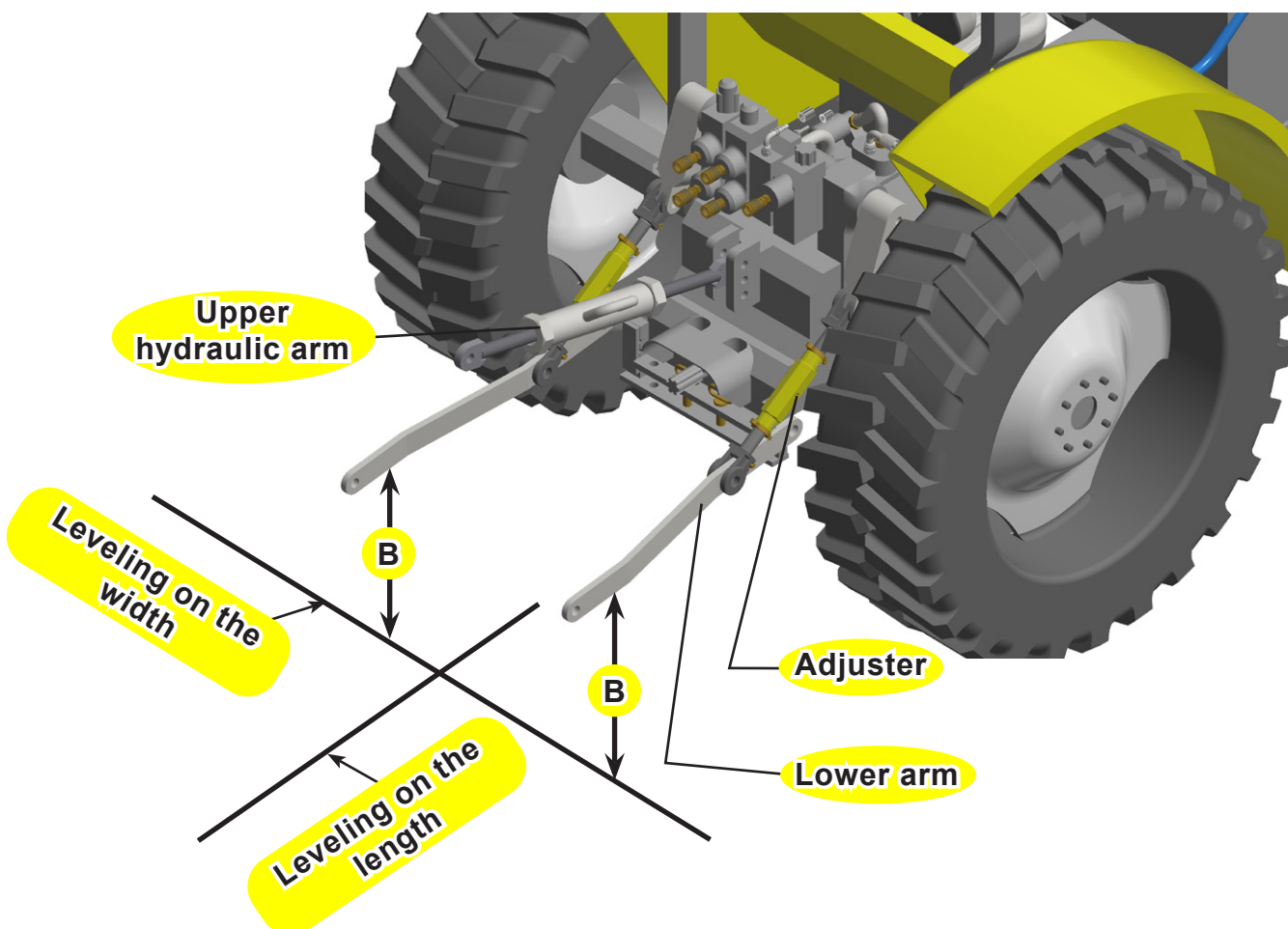
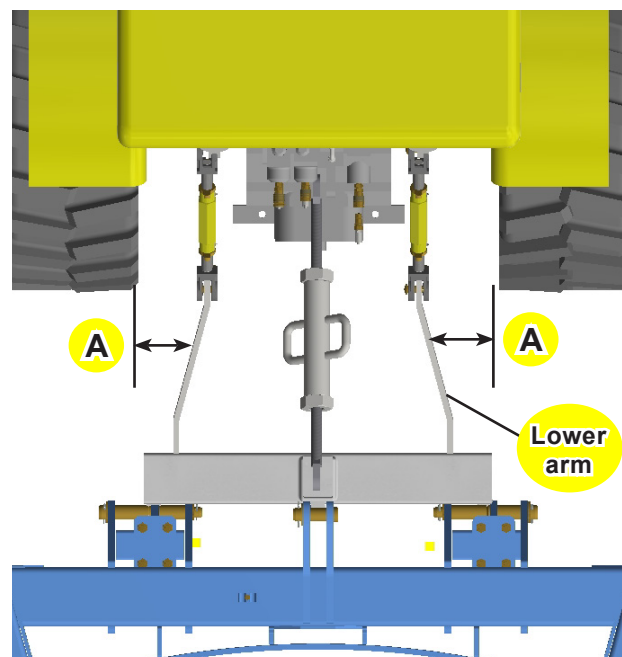
To level the equipment, proceed as follows:

Place the tractor on a flat place and level the equipment on its width (transversal) and on its length (longitudinal).

Check if the distances between the lower arms and tires are equal on both sides (as in "A"). On the width, the leveling is done through the adjuster of the lower right hydraulic arm, leaving the equipment drawbar lifted or both "B" with the same measure.

On the length, the leveling is done through the upper hydraulic arm (third point), leaving the frame parallel to the soil.

The equipment is leveled from the front to the rear by adjusting the upper connection length of the three-point hitch; Shorten the upper bar to lean the equipment forward or lengthen the bar to lean the equipment backwards.



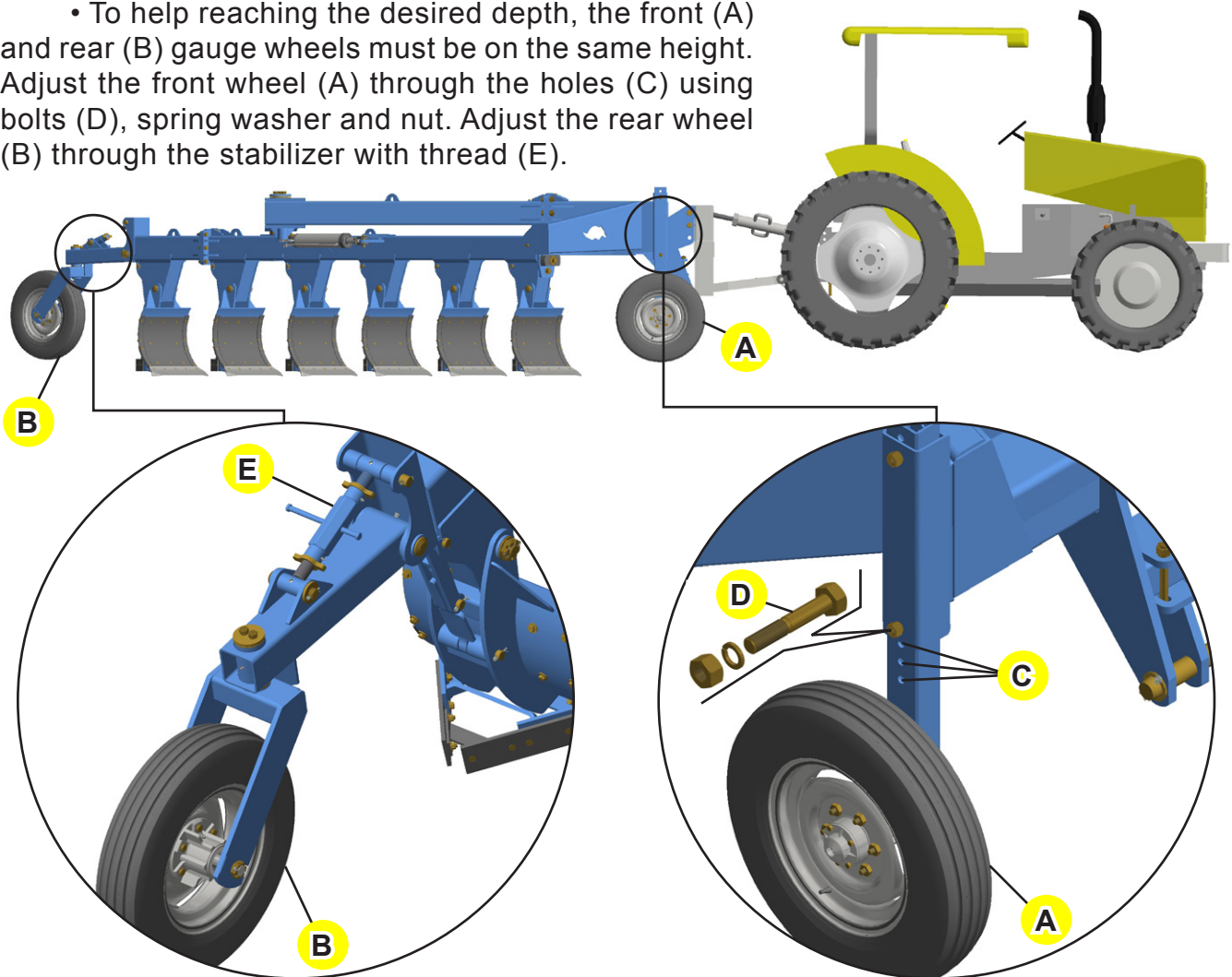
Adjustments and operations

Depth adjustment of the moldboard

Being the plow previously leveled, set the working depth of the moldboard as follows:

- Drive the plow over the soil and make the first pass.
- Redo the settings, if necessary.
- Use the ripple/sensibility control of the hydraulic cylinder to determine the moldboard depth. After making this adjustment, keep it in every operation and activate it only if you wish to change the working depth. (See the tractor manual).

• To help reaching the desired depth, the front (A) and rear (B) gauge wheels must be on the same height. Adjust the front wheel (A) through the holes (C) using bolts (D), spring washer and nut. Adjust the rear wheel (B) through the stabilizer with thread (E).



IMPORTANT

To achieve an uniform depth in every moldboard, the plow must be leveled.

During operation, it is necessary to keep the hydraulic ripple/sensibility control on the operation position according to the desired depth. After this adjustment, use it again only when maneuvering or to lift the plow.

For better ridge tipping, it is necessary to keep a constant working speed.

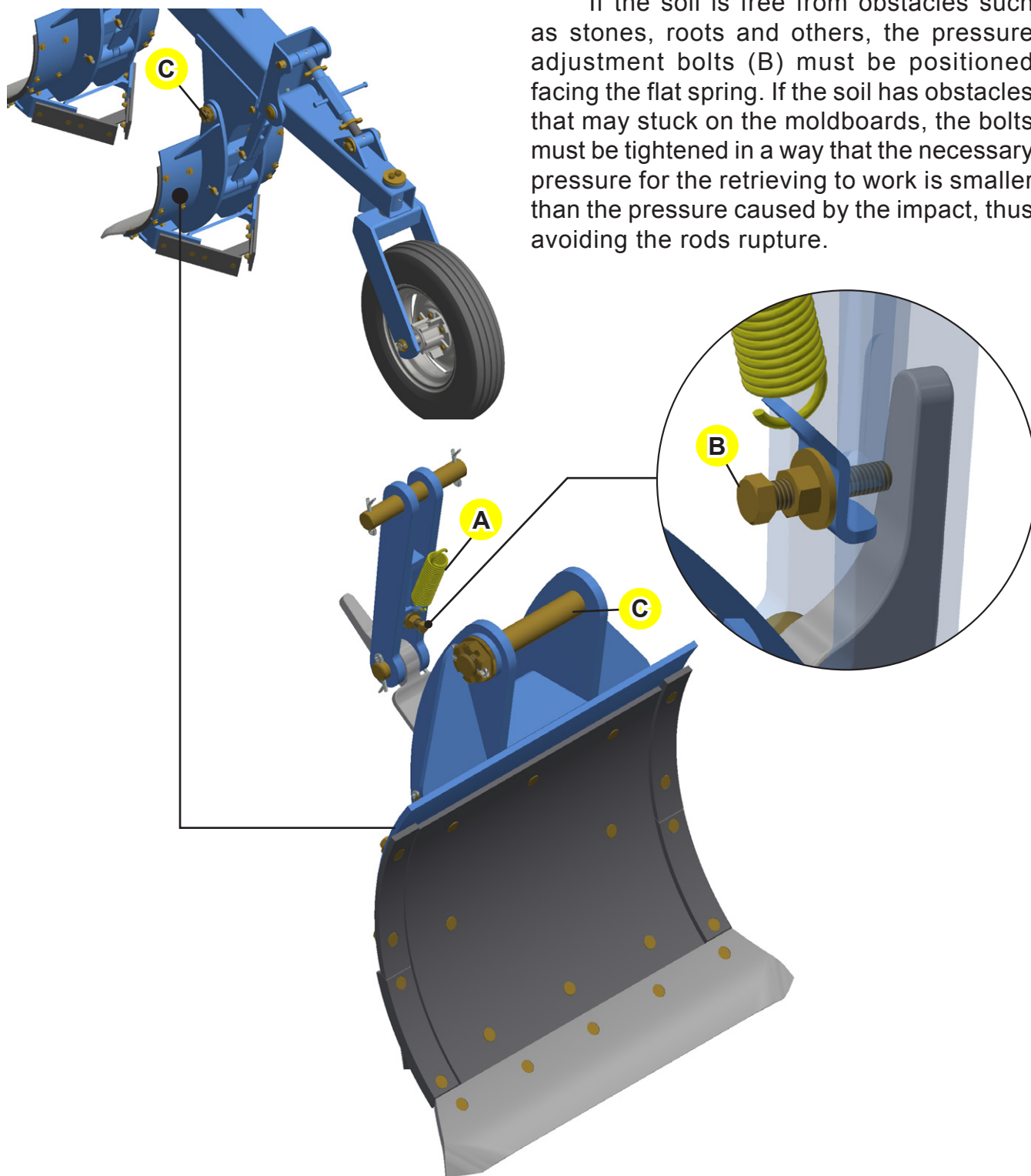
Ideal speed = 5 to 8 km/h.

Adjustments and operations

Automatic retrieving and pressure adjustment

The moldboards are protected with an automatic retrieving system through the flat spring (A) for a greater safety of the equipment and tractor hydraulic system (third point). Therefore, use only original parts for replacing them.

If the soil is free from obstacles such as stones, roots and others, the pressure adjustment bolts (B) must be positioned facing the flat spring. If the soil has obstacles that may stick on the moldboards, the bolts must be tightened in a way that the necessary pressure for the retrieving to work is smaller than the pressure caused by the impact, thus avoiding the rods rupture.



NOTE The bolt (C) must be tightened until there is no clearance between the moldboard and frame support, allowing that the moldboard articulates freely.

Adjustments and operations

Important recommendations

- Before starting the plowing, carry out a general inspection on the equipment and retighten all nuts and bolts, also checking the conditions of all pins and cotter pins to avoid future damages. Repeat this operation after the first day of work.
- Lubricate all grease fittings appropriately.
- 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.

Plow operations

A good performance and job quality relies not only on a proper adjustment, but also on the correct operation of tractor and equipment.

Regarding the tractor performance, the operator must have full knowledge of the commands and resources that needs to be used.

The main factors that influences the job are:

- Equipment leveling.
- Used gear, which is relative to the working speed.
- Plowing depth.
- Tractor position related to the previous furrow.

The tractor gear must be determined by the soil conditions and equipment adjustments, but it is recommended to save some power to not overload the tractor when any unpredictable effort occurs.

We consider 5 to 8 km/h an ideal tractor speed for a plowing job. However, observe the movement of the windrows, which vary according to the tractor speed, soil type and equipment adjustments and can be thrown away too far or fall before being completely inverted.

The plowing depth is usually controlled by the three-point hydraulic system, but it can change with the variety of adjustments and the soil type that is being worked on. The correct way to handle the hydraulic system must be checked on the tractor manual.

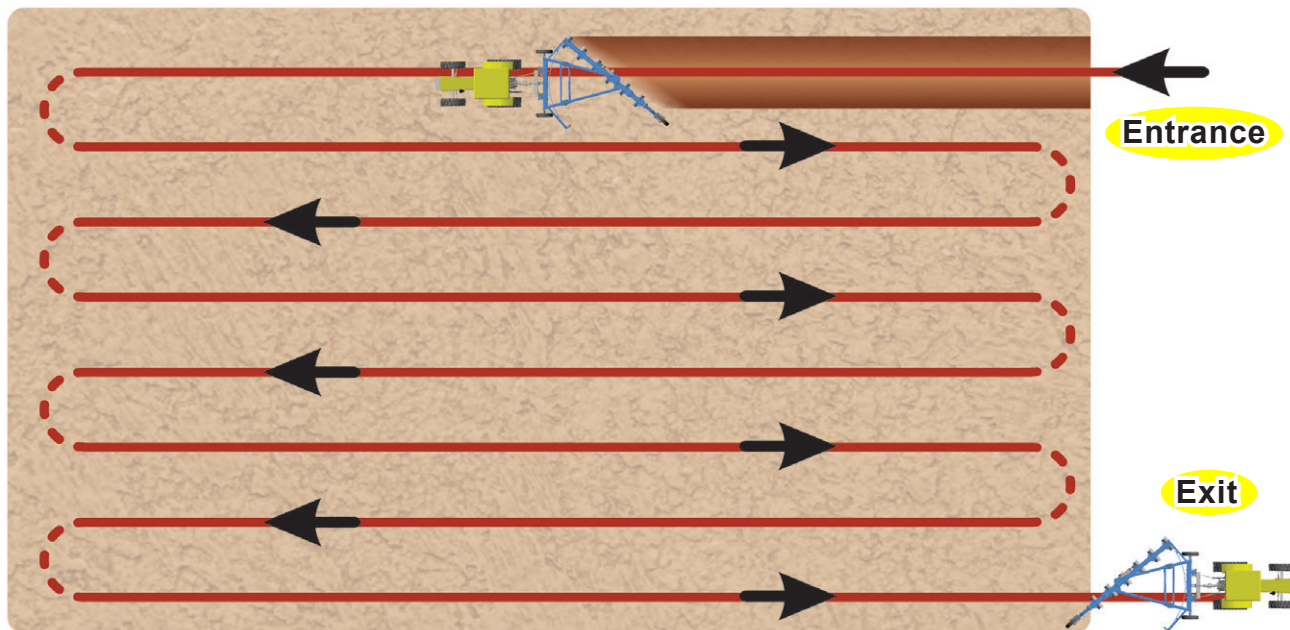


- **Never allow any people or animal to get closer to the plow during the job.**
- **Be careful with the moving parts.**
- **Never operate the equipment without its safety devices.**
- **Always lift the equipment up when it is necessary to maneuver it.**

Adjustments and operations

Ways to start the plowing

Regardless of the format of the field, the plowing is done in strips. To change the direction and to do the reversion of the equipment, lift it for maneuvering.



Troubleshooting guide

Problem	Causes	Possible solutions
Poor penetration.	Hard and dry soil.	Carry out the subsoiling job before plowing.
	Blunt moldboard blade.	Replace it.
	Third-point control valve activation adjustment.	Consult the tractor manual to check how to properly adjust it.
	Forming ridges.	Adjust the upper arm of the third-point.
	Uneven equipment.	Level the equipment according to the instructions on the 'adjustments and operations' section (Plow leveling page).
Poor coverage.	Tractor is far from the furrow.	Position the tractor for a perfect finishing job.
	Blunt moldboard blade.	Replace it.
	Earth getting stuck on the polyethylene plate.	Moisture excess in the soil. Damaged plate that must be replaced.
Equipment pulling to the side.	Uneven equipment.	Adjust the level according to the instructions on the 'adjustments and operations' section (Plow leveling page).

Adjustments and operations

Operations - Important points



- Retighten nuts and bolts after the first day of operation, as well as check the conditions of all pins and cotter pins. Then, retighten every 24 hours of service.
- Carefully observe the lubrication intervals.
- Choose a gear that allows the tractor to maintain certain power reserve, ensuring against unpredictable efforts.
- The speed is relative to the tractor gear and can only be determined by local conditions. We adopted an average 5 - 8 km/h, which is not advisable to overcome to maintain service efficiency and prevent possible damages to the equipment.
- Only people who own a complete knowledge of the tractor and equipment must operate them.
- For hitching the equipment, perform the maneuvers in slow gear and on a wide area, also being ready to brake when necessary.
- Remove pieces of wood or any object that may attach in the moldboard.
- Only pull the equipment using a tractor with enough engine power.
- During working or transportation, do not allow passengers on the tractor or plow.
- Keep the lower arms of the tractor hydraulic lift adjusted.
- Keep the equipment centralized with the tractor and on the same level of the soil surface.
- Never carry out the equipment reversion when it is supported on the ground.
- To carry out any verification on the equipment, lower it to the ground level and shut down the tractor engine.
- Whenever you unhitch the equipment, either in the field or shed, do it on a flat and firm surface and use parking jacks.
- Always make carefully and controlled operations.
- The correct tire inflation is important; keep the same pressure on all tires.
- The position and ripple hydraulic levers have fundamental functions. Carefully check the instructions on the 'adjustments and operations' section (Cutting depth page). Also, check the tractor manual for more information.
- Carry out the plowing job by following the contour lines, always throwing the earth upwards.
- Keep a constant speed during the whole operation.
- Relieve the control valve pressure before disconnecting the quick couplers and when doing any verification on the hydraulic cylinders / retention valves.
- As previously mentioned the AARP plow has several settings, but only the local conditions can determine its best adjustment.

Maintenance

Lubrication

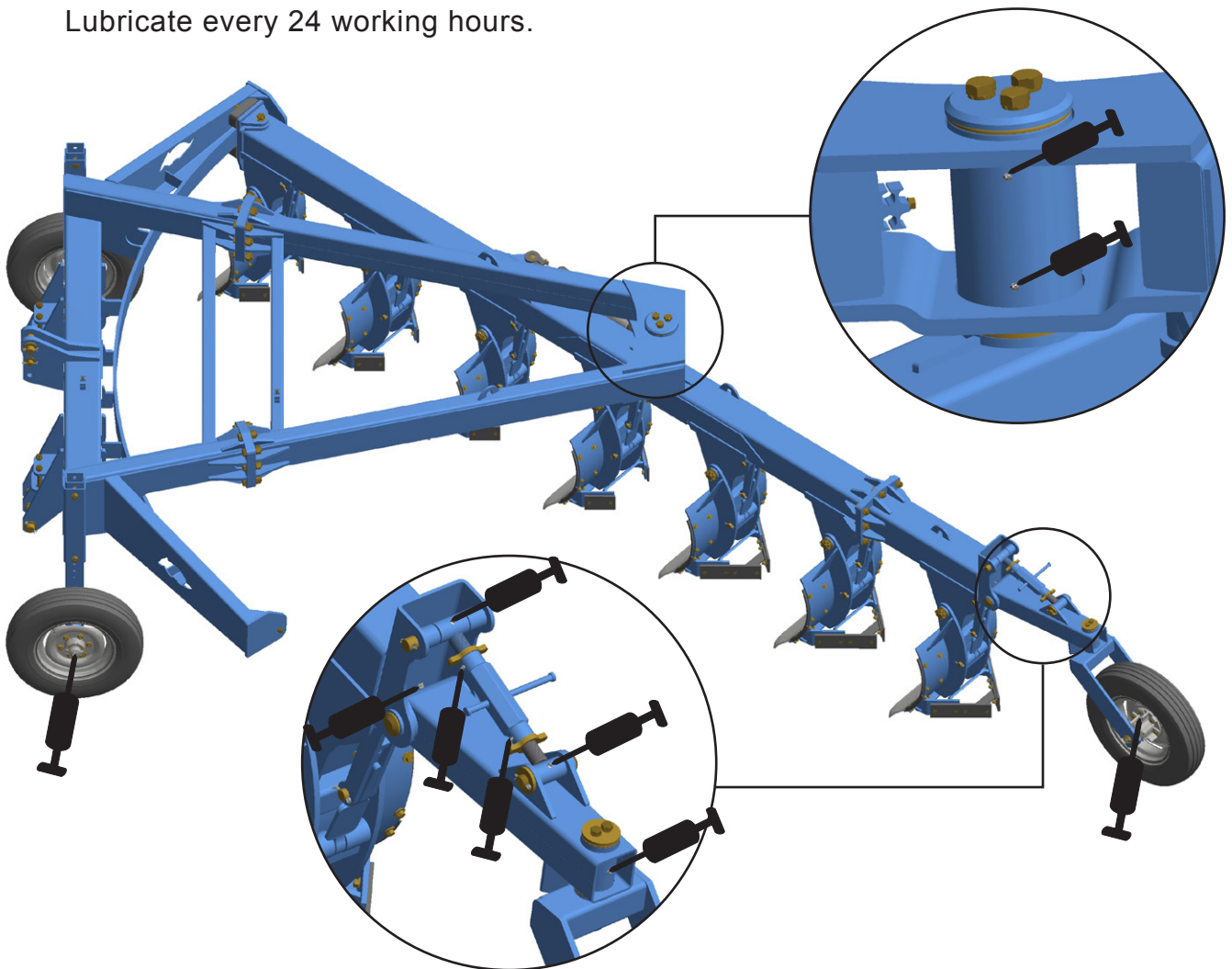
To reduce the wear caused by the friction between the moving parts of the equipment, it is necessary to carry out a proper lubrication as follows:

Lubricate all grease fittings every 24 working hours.

- 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 up all grease fittings with a cloth before introducing the lubricant and replace the defective ones.
- Insert a sufficient amount of new grease.
- Use medium consistency grease.

Lubrication points

Lubricate every 24 working hours.

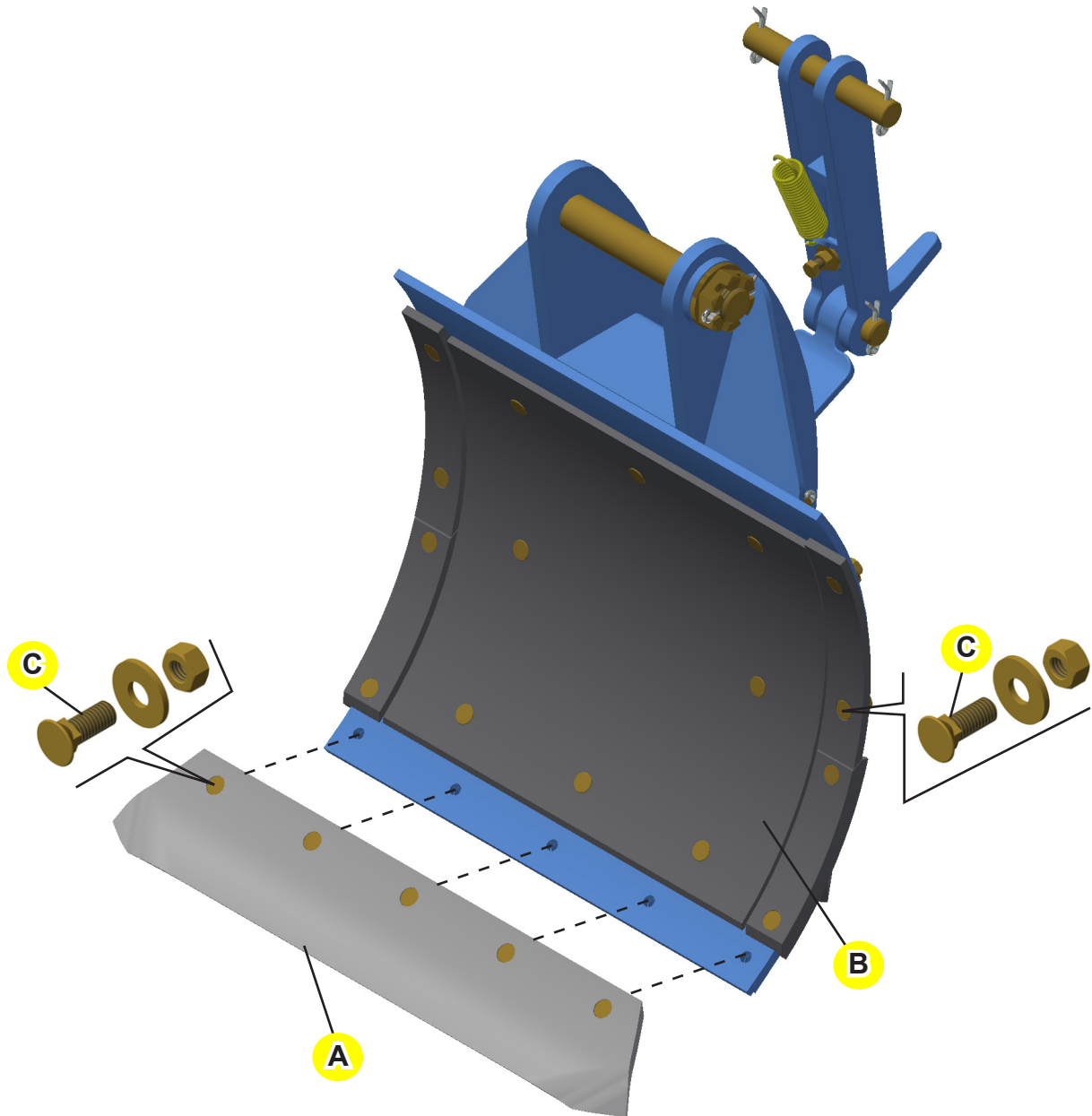


ATTENTION / Lubricate the points shown above and all grease fittings as well.

Maintenance

Replacement of the blades and polyethylene plates

When noticing excessive wear of the blades (A) and polyethylene plates (B), replace these parts by fully loosening the fixation bolts (C), flat washers and nuts.



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.

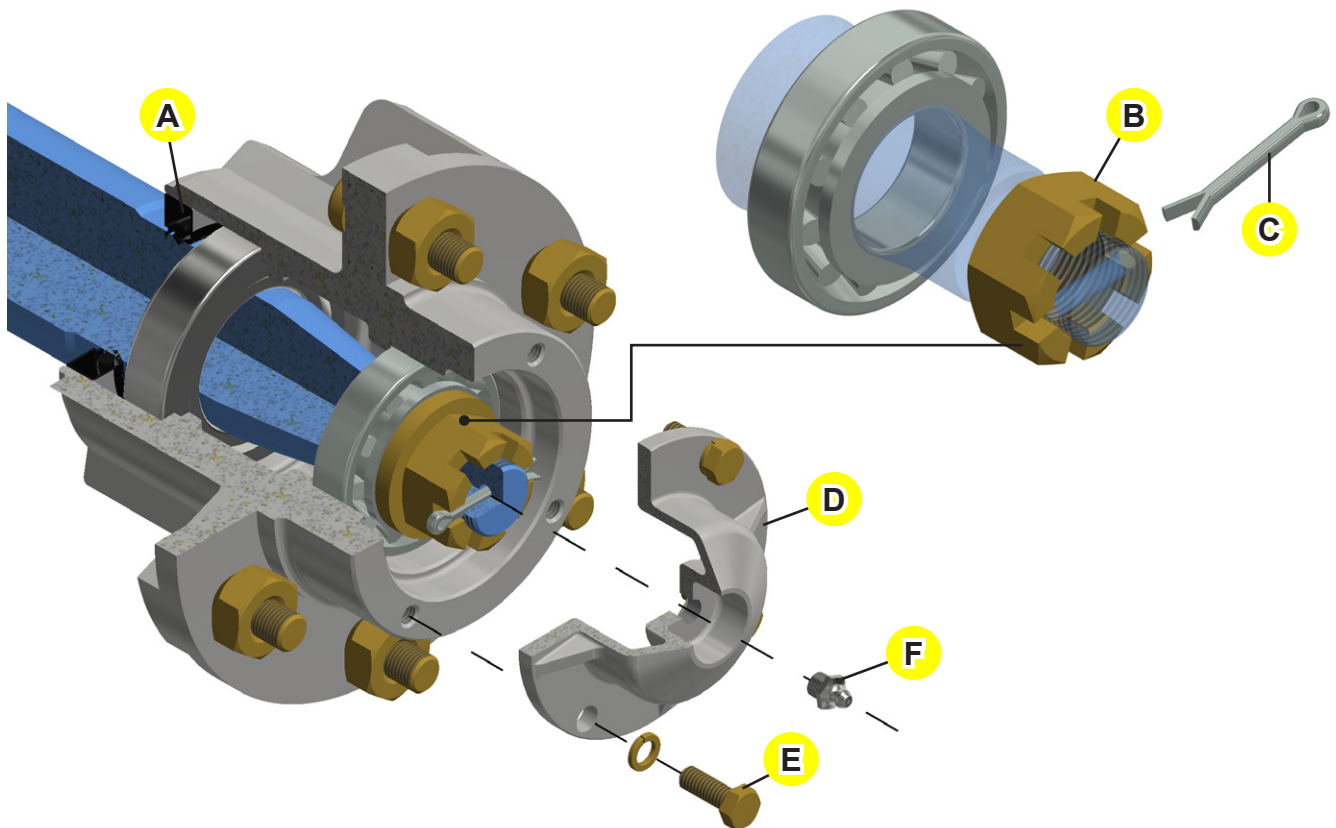
Check the existence of clearances and the condition of the bearings and retainers. Replace any damaged component or with excessive wear.

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 grese 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

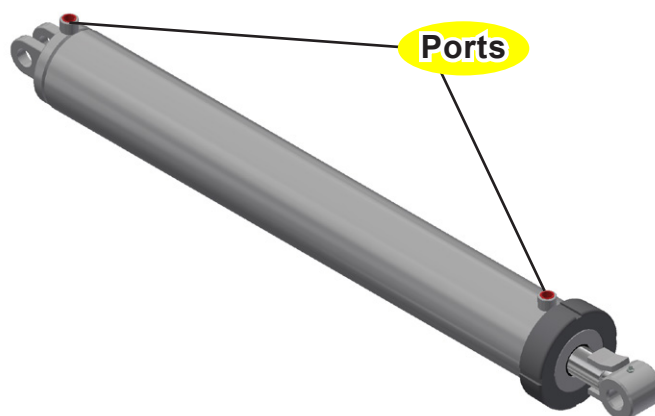
When cylinder repair is required, clean off unit, disconnect hoses and plug ports before removing cylinder.

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.

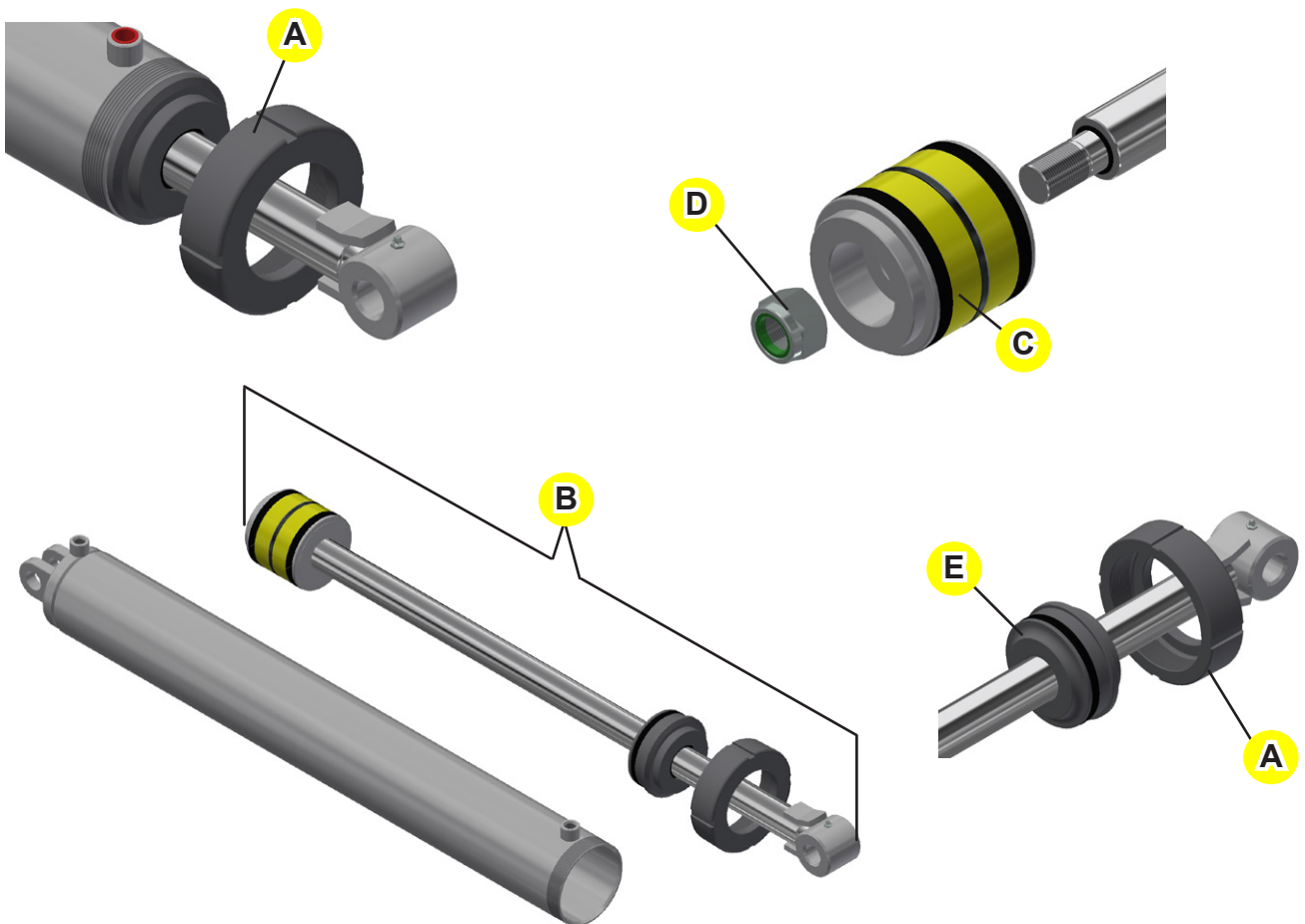
Maintenance

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.

Maintenance

Plow maintenance

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

Do not carry out any repair on the hydraulic system if it is pressurized or if the cylinders are under load; a serious accident may result from this unsafe act.

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

The blades and the polyethylene plates must be replaced as soon as you notice an excessive wear.

After some hours of operation, the bolts on the plow 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 the moving parts for wear occurrence. Replace them, 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

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 by the tire manufacturer.
- Never weld or heat a wheel. This 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.

6.00 x 16 tire - 6 ply 52 PSI



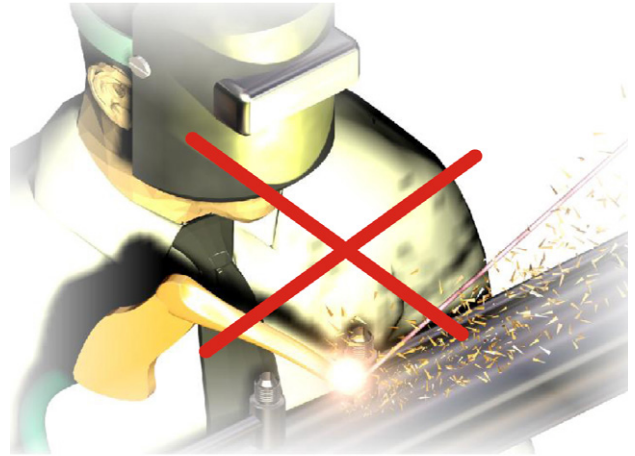
NOTE For the cases where the maximum pressure is not specified on the tires, consult the tire manufacturer and adopt the indicated pressure by them.

Maintenance

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:

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

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 AARP (5 moldboards):

R = ?

L = 2.40 m

V = 5,000 m/h

E = 0.90

X = 10,000 m²

$$R = \frac{2.40 \times 5,000 \times 0.90}{10,000}$$

R: The hourly income working with an AARP that has 5 moldboards will be of, approximately, 1.08 hectares per hour.

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

Based on this calculation, we prepared the table on the following page, which 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 moldboards	Cutting width (m)	Hourly income (ha)	Daily income (ha)
AARP	05	2.40	1.08	9.72
	06	2.88	1.30	11.66
	07	3.36	1.51	13.61
	08	4.22	1.90	17.09

NOTE / An average speed of 5 km/h was assumed to prepare the table above.

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 the plow, AARP with 6 moldboards (Hourly income = 1.30 Hectare).

$$\text{So: } \frac{100}{1.30} = 76.92$$




It will be spent 77 (seventy-seven) 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.

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

	GRADE 2 No Marks.		GRADE 3 3 Marks.		GRADE 8 6 Marks.
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[G:\VALSON\Manuais_Ingles\Torque]

NOTE

For metric conversion:

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

Important

ATTENTION

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

Images are for illustration purposes only.

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

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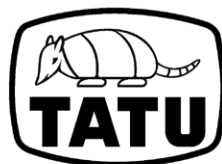
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