Manual for Maredo® MFrame 319-030 equipped with the MT200-REV 030 Verticut heads

Serial #:

IMPORTANT NOTE:

This machine cannot run by its own. It needs a (compact) tractor to drive it. An experienced driver is required, alongside a well-equipped, safe tractor.
MAREDO DOES NOT TAKE ANY LIABILITY FOR TRACTOR OR DRIVER DAMAGES WHO ARE TO BE BLAMED BY MIS-USE OR MIS-CHOICE.

MAX. PTO REV. : 540 RPM
MAX GROUND SPEED : 8 KMH/ 5 MPH.

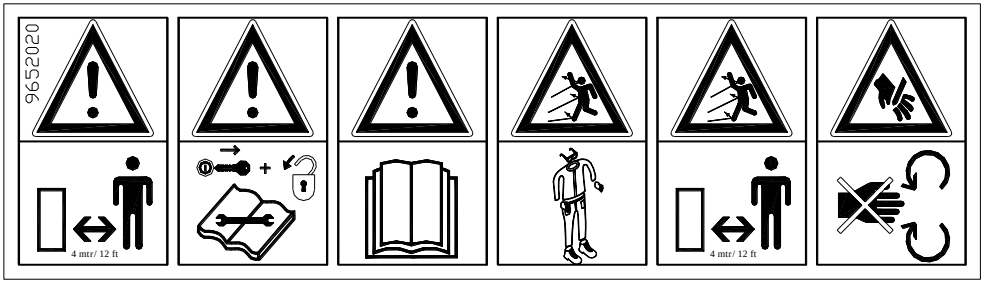
Note:
For a safe operation it is essential, that the operator reads and understands the manual of this MAREDO Machine and the tractor.

MAREDO BV, RIJKSSTRAATWEG 16, 3956 CR LEERSUM, NETHERLANDS.
WWW.MAREDO-BV.COM. EN 1607

1.0 SAFETY INSTRUCTIONS.

1. Never **disconnect or shortcut any of the safety devices**.
2. Every **MAREDO user must be fully informed** and understand the safe use of the MAREDO machine.
3. **Inspect the ground**, where the MAREDO machine is to be applied. Remove loose obstacles, avoid uneven areas.
4. **Drive carefully** during work and during transport.
5. Ensure that **other people are standing at least 4 mtr./ 12 ft. away** from the MAREDO machine during work and transportation.
6. **The driver should use appropriate clothing**. Wear strong shoes with steel enforced toe caps, long trousers, gloves, tie up long hair and use protection glasses for the eyes.
7. **Choose the right tractor** by checking the required specifications.
8. **Never overload** the MAREDO. This is visible when the head starts vibrating or bouncing. The machine gets unsafe and may break down.
9. **Check the MAREDO minimal once a week**, to ensure there are no loose bolts and nuts. Check for damaged parts and repair them.
10. The MAREDO **may never be used without protection covers** and safety decals.
11. **Use only original MAREDO spare parts**, in order to ensure the safe operation of the machine.
12. **Never use the MAREDO** in the dark, in heavy rain, on frozen grounds, stony conditions and/ or on slopes steeper than 30 degrees.
13. **Maintain a log book** of the repairs.
14. Be aware that **changes made at the MAREDO**, releases MAREDO from CE regulations. You should homologate the machines yourself.

Act on the safety instruction mentioned on the safety decal:



2.0 FOREWORD.

Congratulations with the purchase of your MAREDO® machine. To ensure the safe and long lasting operation of this MAREDO® machine, you and anyone else using this machine, should read and understand this user's manual.
Also ensure that you understand and practice the safety rules, as described in this manual.

This MAREDO® machine is delivered accomplished by a guarantee against material, design and assembly errors. This guarantee applies for a period of 12 months, as from the date of purchase.

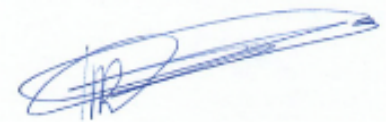
3.0 TECHNICAL SPECIFICATIONS.

Model	: MFrame 319-030 plus MT200-030 verticut heads (3).
Working width	: 1900 mm/ 76".
Working depth	: 0 -25 mm/ 0- 1.0".
Blades	: Carbide tipped blade thick 2.3 mm/ 0.09".
Side to side spacing	: 40 mm./ 1-5/16".
Gearbox oil	: SAE 80/90 W.
Tractor size	: Min 25 HP + 3Pt CAT1 500 kg/ 1100 lbs lift capacity.
PTO speed	: Max 540 rpm.
Weight	: Complete machine: 365kg/ 800 lbs

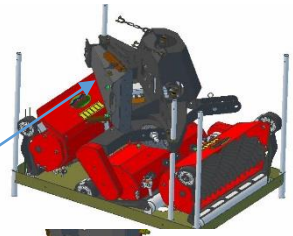
4.0 EU- DECLARATION.

We, MAREDO, Rijksstraatweg16, 3956CR. Leersum, Holland, hereby declare fully on our authority, that the product:
MAREDO® Mframe 319 equipped with MT200 verticut heads, with serial number as indicated on the machine and in this manual, to which this declaration applies, has been manufactured in line with NEN-EN –ISO 14121-1:2007, according to the stipulations of The Machine Directive 2006/42/EG.

Marinus Reincke Maredo BV Holland.

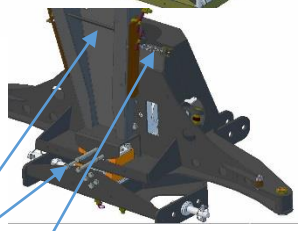


5.0 UNPACKING AND FIRST SET-UP:



The MAREDO machine is delivered on a specially prepared steel pallet, at which the heads and the MFrame are firmly packed. Assemble the machine as follows:

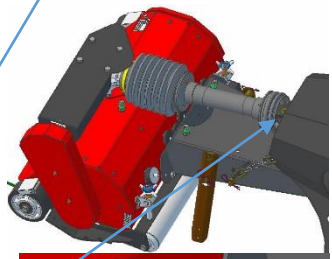
5.1. Remove all items from the pallet. Unscrew the rear draw bar from the MFrame. In the end you should have the following parts available: *3 x heads (RH, LH and rear one), 1x MFrame, rear draw bar, 2x PTO's for RH and LH head , 1x half PTO shaft for rear head, 1 x tractor PTO and 2 x tube clamp d=80 mm (3") to fix the PTO to the side heads.*



5.2. Put the MFrame with "it's nose" on the floor.

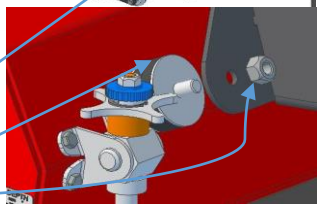
5.3. Mount the rear draw bar with the 3 bolts, which go through the rubber pivot block. Put the self-lock nuts at the other side and tighten all 3 bolts well.

5.4. Connect the chain with D shackles at each side of the rear draw bar. Tighten the D shackles well.
NOTE: Set the chain length at maximum. It can be shortened later on when the rear head is too close to the ground, when raised.

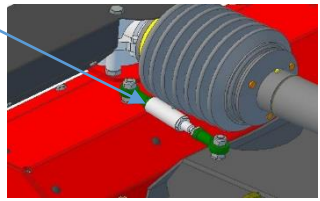


5.5. Put the MFrame on its storage stands on the floor.

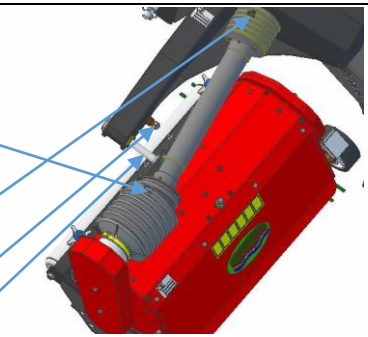
5.6. Mount the rear head first. The PTO is already pre-mounted at the head side. Insert the other PTO half into this one and next slide+ secure the PTO to the rear PTO shaft of the MFrame gearbox. If the PTO is in place, mount the rear head to the rear draw bar of the MFrame with the 5 rubber blocks. Tighten all nuts (5) well.



5.7. Finally mount the two push-bars (1 x standard + 1 x air spring) on top of the head and draw bar and the rear head mounting is completed.

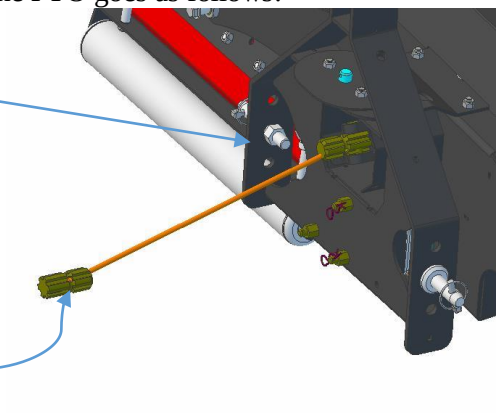


5.8. We continue with the mounting of the side heads to the MFrame. This goes as follows:



Mount the PTO with the long outer extension cover to the heads first. IMPORTANT: *when the extension cover is secured with the tube clamp, be sure the hole in the cover faces upwards.*
Next insert the other PTO half and connect that side to the MFrame gearbox. Secure the tube with the chain. Again with the hole in the cover facing up.
Next mount the head to the MFrame. Remove the pivot-bush + nut and also the nut of the notch.
Slide the head in place and tighten the pivot-bush nut and the notch-nut well.
Do exactly the same with the head at the other side. Be sure the holes in the PTO covers face also upwards, like the PTO on the other side. That makes greasing easier.

5.9. It is important that the tractor PTO length is correctly determined. Not only when the machine is new, but every time another tractor is used for this MAREDO machine. The way to calculate the correct length for the PTO goes as follows:



A- Connect the MAREDO machine to the tractor's 3 Point linkage.
B- Adjust the top-link so the Aframe is vertical.
C- Move the tractor 3P-hitch up and down and find the position at which the PTO shaft is the shortest in length.
D- Fix the 3 Point hitch at this position and secure the machine + tractor.
E- Measure the length between the two PTO shaft-ends from groove to groove (=L1).
F- Next measure the length of the current PTO drive shaft from secure pin to secure pin with the shaft fully in (= L2) .
G- If L2 is at least 50 mm or 2" less than L1, no action is required. If that is not the case take the PTO shaft apart and shorten each PTO half (steel tube and plastic cover) : (L2 –L1) + 50 mm/ 2".

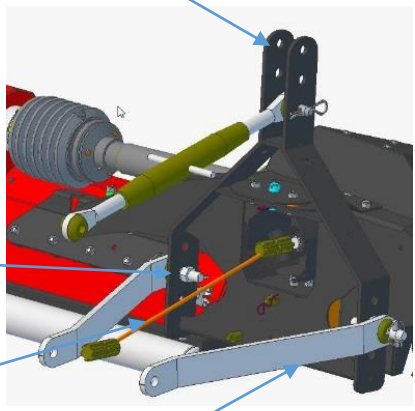
H- Example: We measured L1= 500 mm (20") and L2= 600 mm (24"). L2 is more than L1, so we need to cut each PTO half (plastic + steel tube) with (L2 -L1) +50 mm = (600-500)+50= 150 mm (or (24- 20")+2"= 6").

I- Deburr all the parts and mount the PTO shaft to the MAREDO machine. The PTO drive is ready to go.

6.0 (FIRST) JOB PREPARATION + IMPORTANT NOTES.

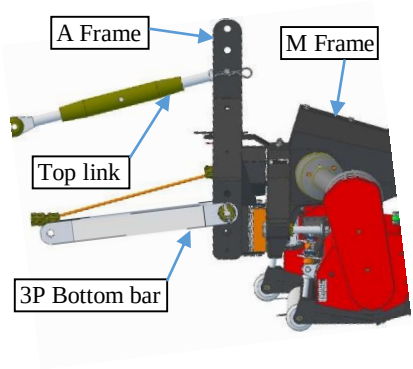
6.1 TOPLINK & 3-POINT LINKAGE SETTINGS.

At the top of the Aframe we have 3 holes for the top link. If a higher hole is chosen, the MAREDO machine will be tilted more forwards when raised. Which means more clearance for the rear head. A clearance of at least 200 mm/ 8" is needed for a safe travel job. At the bottom we also have 3 holes. Check with the stroke of the bottom 3p-bar of the tractor, which one is the best. It is very important that the 3P bottom bars have some travel left in the bottom position to allow the machine to following the undulations The connecting pins can also be reversed facing to the centre (in case we use a tractor with narrow 3P bottom bars). We also have a CAT2 mounting kit available for CAT 2 tractors.



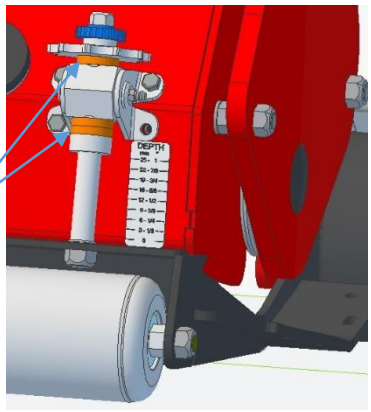
Check the PTO length all the time, see point 5.9. When it is too long or too short, damage to the driveline may occur.
Adjust the side-to-side swing of the 3P linkage stabilisations at the tractor side till it swings appr. 150 mm./ 6" in total. This is needed to allow the machine & tractor to make curves during work (Radius > 2.0 mtr./ 6').

The top-link length is important, as it determines the pressure on the rear head. ***The starting position is always a vertical position of the A frame.***
The rear head is mounted to the MFrame via a triangle drawbar. This drawbar is connected to the MFrame via a rubber block pivot point (see pt. 5.3). This pivot point allows the rear head to move in all necessary direction and to follow the undulations and curves. The A frame is also mounted to the MFrame via a rubber pivot point. This allows the tractor to make curves during work. If the Aframe plus the MFrame is pushed backwards by enlarging the top link, more pressure is put on the rear head via the rubber pivot points. This may help to keep the rear head more stable on the ground. HOWEVER DON'T PUSH THE A-FRAME TOO MUCH BACKWARDS (no more than 10° from the vertical position) AS IT MAY HURT THE RUBBER PIVOT POINTS.



6.2 DEPTH SETTING.

You have two depth adjusters at each head. They can be adjusted by hand. Unscrew the top secure nut (blue) first. Next the second spoke-nut can be turned. The front roller will move up and down. At the decal you can see the (theoretical) depth setting. Some NOTES:



A- The theoretical depth setting is not the same as the actual cutting depth. This depends on the "softness" of the turf and how much the roller + wheel are pushed into the turf. This deviation can be corrected by moving the distance washes to the top or bottom position.

B- Set both sides at the same depth.

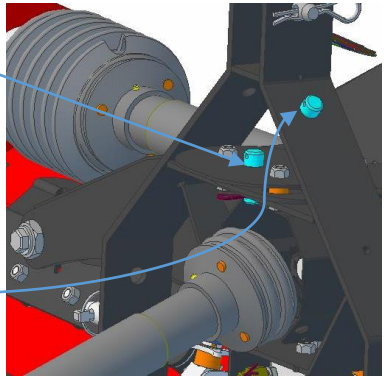
C- Do NOT adjust one side more than 10 mm/ ½" before compensating the other side.

D- If the (blue) lock nut is tight, "unscrew" it by turning the spoke nut first.

E- After the depth setting is done, tighten the (blue) top nut to secure the setting.

6.3. UNLOCKING THE AFRAME.

By removing the pin in the centre of the Aframe, the A frame is unlocked from the main chassis and the machine is ready to make curves during work. For long transport travels, it is essential to put the lock pin back in position, so the Maredo machine does not swing behind the tractor. When unlocked put the pin in the storage hole, so you can easily see if the machine is locked or not.



6.4. START EN STOP PROCEDURES.

6.4.1 Inspect the area that you want to treat. Remove loose objects. DON'T USE the machine in the dark, in heavy rains, on frozen grounds, stony conditions and on slopes steeper than 30 degrees.

6.4.2 Gently drop the MAREDO machine till 100 mm/ 4" above the ground.

6.4.3 Engage the PTO and increase the engine revs till the PTO runs appr. 540 revs.

6.4.4 Lower the machine gently in the ground. DON'T LET IT BOUNCE.

6.4.5 Start moving forward. The ground speed depends on the depth setting and the ground conditions. Start with appr. 3 km/h (2 mph). Max speed is 8 km/h (5mph) or till one of the heads get unstable. Reduce the groundspeed at that moment immediately.

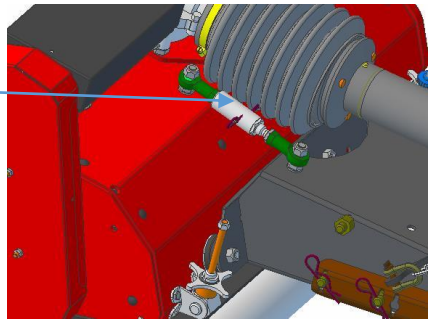
6.4.6 You can make curves, as long as they aren't tighter than a radius=2.00 mtr./ 6'.

6.4.7 At the end of the pass raise the heads and disconnect the PTO at the same time.

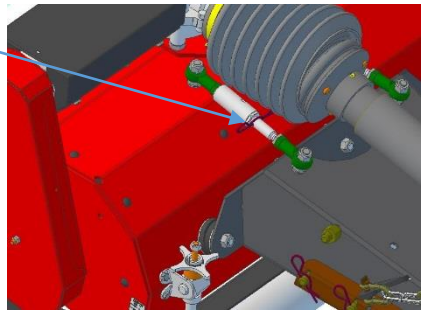
6.4.8 Turn around and start another pass in the same way as described above.

6.5 SECURE THE HEADS AGAINSY TIPPING FOR- AND BACKWARDS
Standard the heads can individually follow the undulations via the front roller and the rear wheels. This is possible because the heads are flexibly mounted with rubber blocks to the Mframe. The heads can be secured for two reasons:

6.5.1 LOCK IT IN THE WORK POSITION.
The heads can be locked in the work position if e.g. the heads are unstable in following the undulations. If we lock the heads, they aren't following all undulations and be more stable. An R pin (or bolt M5) could be mounted through the tube hole and the hole in the shaft. The push bar is fixed as of that moment. The depth can still be adjusted in the same way, only the actual setting is not what is read at the decal. Although the rear wheels may not touch the ground anymore, they still prevent the head from digging in (deep) undulations.

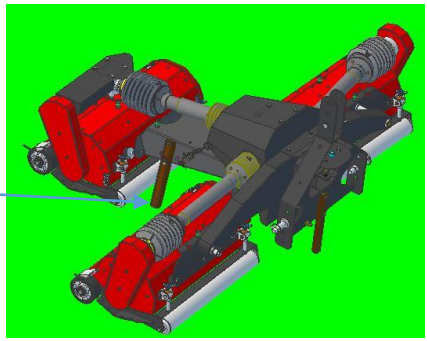


6.5.2. FIX IT IN THE STORAGE POSITION.
If the push bar is fully out (at the moment the heads are raised and in the air), we can put an R pin through the rod in front of the tube. This can be used during storage/ transport purposes. If the heads are locked this way, the blades will not touch the ground when the machine is put on a (hard) surface.
This is one way to prepare the machine for storage.



The other one is using the support storage stands and is better. Because the weight of the MFrame does not rests on the heads, but on the storage stands. You can use both options, which makes that the blades with carbide tips will never touch the ground. This is important when the machine is stored on a hard (concrete) floor.

6.6 DISCONNECT & STORE THE MACHINE.



Before we disconnect the machine from the tractor, the machine has to be set in the storage mode. If that isn't done properly, damage to the machine and blades may occur, especially on hard (concrete) surfaces.
The 3 support stands should be placed in the storage mode, which is vertically down. **NOTE:** BE CAREFULL AS YOU ARE ENTERING A DANGEROUS AREA AROUND THE MACHINE AND THE TRACTOR.
When the 3 support stands are in the correct secured (vertical) position, the machine can be driven to the storage place and be gently lowered on the stands. Disconnect the tractor and the machine is stored.
NOTE: Disconnect the machine only on a levelled surface.

7.0 MAINTENANCE.

This MAREDO Machine is a low maintenance machine. Most bearings are sealed and do not need re-greasing. The following maintenance is needed:

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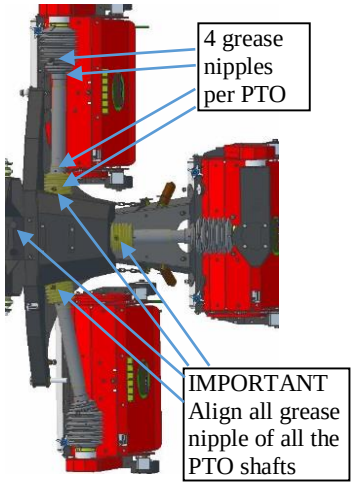
7.1. CLEANING THE MACHINE.

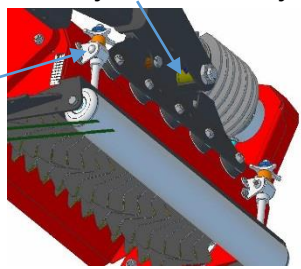
We strongly advise to clean the machine after every (daily) job. Use compressed air or low pressure water. Be very careful with high pressure/ high temperature water cleaners, as they may damage the moving parts in the machine and the paint.
If you clean the machine regularly, the dirt will not stick to the machine and the machine will work better next time.

7.2 GREASE POINT/ GREASE INTERVALS.

All 4 PTO shafts are the most important items that need greasing. They need one shot of EP (Extreme Pressure) grease every 25 hours, starting with a first shot after the first 4 hours. The PTO shafts that we use are easy to grease as all (4) grease nipples per shaft can be accessed from one side. As long as the PTO's are well assembled, the grease nipples of all 4 PTO can be grease at once without having to rotate any PTO shaft.

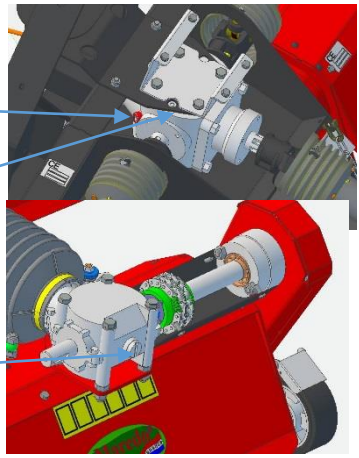


Next we have two more grease nipples that need a half shot every 50 hours. They are located under the MFrame and grease the front pivot points of the two front units.
Also grease the depth adjusters by 1/4 shot every 50 hours.
DON'T over-grease the grease points.



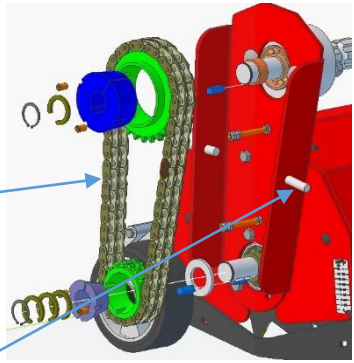
7.3 OIL CHECK AND REPLACEMENT.
There are two gearboxes mounted on this MAREDO machine. Both use the same gearbox oil SAE 80/90W. The first time the oil needs to be replenished is after 100 hours of use, after that it must be done be every 300 hours or once a year.

The main gearbox is mounted on the MFrame and drives all the 3 different heads.
Check the oil level at this plug
(in the middle at the front)
Fill or add oil through this plug
At the bottom there is a plug to drain the oil.

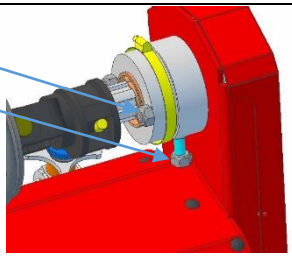


The second gearbox is located on top of the rear MT head and drives only the rear head. The oil level sit at the rear side. This is the same plug to drain and fill the oil.

7.4 CHAIN DRIVE & REPLACEMENT.
The Heavy Duty chain **doesn't need lubrication**. It only needs tensioning every 20 hours.
DON'T OVER-TENSION. The life time of bearings and chain will be reduced.
The correct tension is achieved, when the chain-straight-end (in between the two sprockets) can be moved sideward by appr. 10 mm (1/2"). It must be re-tensioned when this movement gets 25 mm (1"). The best way to check the tensioning is by removing the top cover. This allows an overall check as well at the same time. A quick check can be done by using two 10 mm. (3/8") rods, which are put through the holes in the cover and placed on top of the chain. Push the rods one after another and measure the chain (rod) movement. If it is more as described, re-tensioning is necessary.



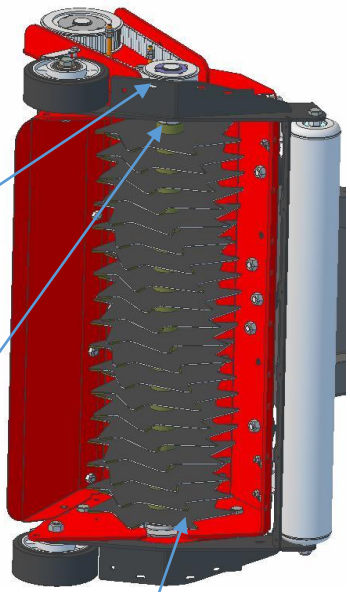
Tensioning is done by moving the top shaft housing up and down. Release the two main nuts and next move the housing up or down with the threaded stud + nut under the housing.



For the rear head it is important to check the alignment with the gearbox as well. If the shafts are too much out of line, re-position the gearbox.
It is advisable that when the chain needs to be replaced, the (hardened) sprockets are replaced as well. This will increase the new chain's lifetime.

8.0 REPAIR & REPLACEMENT.

8.1 REPLACEMENT OF THE BLADES.



In case the carbide tipped blades are worn out, they can be replaced as follows:
= Clean the head and put it firmly on the side.
= De-tension the chain.
= Take the front roller adjuster apart and turn the front roller + frame backwards.
= Remove the small sprocket wheel. Note this is a taper-lock system. Remove the two Allen screws and put one in the centre hole. Tighten it and the taper-lock will come apart.
= Remove the 2 x 3 bolts/ nuts from the 2 main bearings at each side of the shaft.
= The whole shaft with blades can be removed.
= Next remove the bearing at the pulley side.
= Unscrew the main nut that tightens all blades. NOTE, because Loctite has to be used to lock this nut, you may need to heat the nut till 60 °C. The Loctite will soften and you will be able to remove the nut.
= Slide all blades + distance bushes of. Don't mix up the bushes at the start and end. Carefully lay them aside.
= Start to assembly the new blades with the distance bushes. ***NOTE the blades should be mounted in a spiral,* like is shown in the picture.**
= Use Loctite for the main nut. Tighten this nut well (min. 400 Nm torque).
= Mount the main bearing back on and assemble the complete shaft back in the chassis.
= Assemble the pulley again. The two Allen screws of the taperlock should be back in the two outer holes. Tighten them one-by-one up to 20 Nm/ 14.5 ft lb. Re- check this after 10 hours of usage.
= Assemble the chain and tension it like described under 7.4.

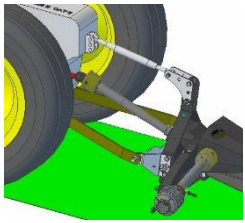
9.0 SPARE PARTS.

For a complete overview of all parts for this MAREDO® machine, please look at our web site under support (www.maredo-bv.com/support/).

A key part:
1838220 Carbide tipped blade for MT200, 15 per head/ 60 for a set.

10.0 OPTIONS.

10.1 CAT 2 mounting kit.
This MAREDO MT 200 is specially designed for small compact tractors with a CAT 1 3 P linkage.
If a bigger tractor (with CAT 2) is used, the standard MT 200 may not fit well.
A CAT 2 mounting kit is developed that fits on the standard MT 200 and turns it into a CAT 2 machine.



10.2 PTO shaft with slipclutch.
Since we don't use any belts in the drive line, there aren't any safety components in the drive line, in case we hit hard obstacles. If that is to be expected, it is better to use our optional PTO with an (adjustable) slip clutch. This will protect the drive line of the MT 200 against breakages.