

HAMMER MILL

OPERATOR'S MANUAL

MMMB

Models

MMRB-20

MMIB-20



Part Number
4350-2130-01

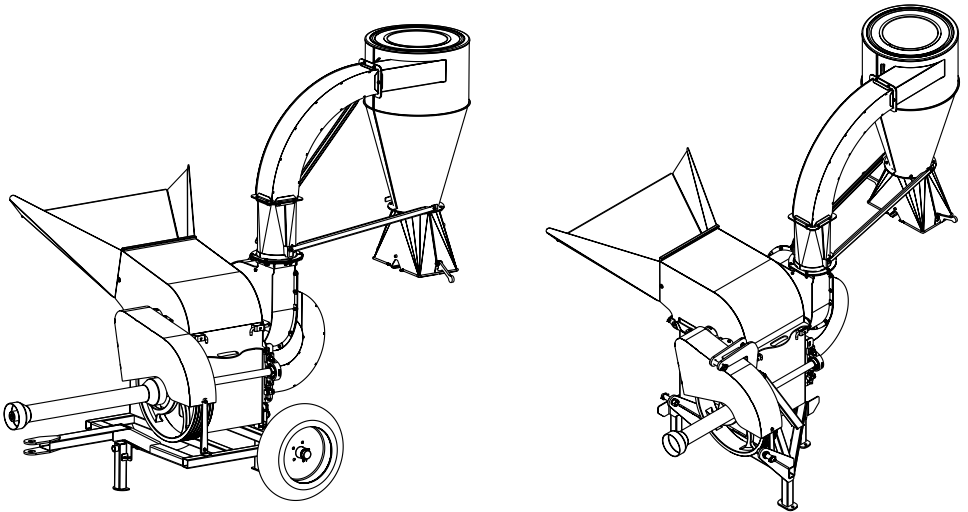
INTRODUCTION

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL MUST BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacements and fasteners.

LEFT and RIGHT SIDE is determined looking at the direction of the machine.



4350-2130-01 (Rev. 17/10/12)





TO OUR CUSTOMERS:

Congratulations for acquiring a Bison product®.

We are confident in your excellent decision to purchase Bison® equipment, and are honored to have you as our valued customer.

Your dealership shall make the technical pre-delivery of your equipment, and a trained technician shall provide you maintenance and operation instructions contained in this manual.

Get in contact with your dealership representative if you have questions regarding your equipment or need specialized help.

We recommend that you read this manual before operating this equipment. Therefore, the time you take to learn about all maintenance features, adjustments and recommendations will result in the long and efficient life of your equipment.

This equipment is covered by a warranty duration provided by your Bison® authorized dealer at the purchase or technical delivery of the same.

Bison® is a Brand of Tecnomec Agrícola, S.A. de C.V., Aguascalientes, México.

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GENERAL INFORMATION

OPERATOR'S MANUAL

If this manual is lost or destroyed, a new copy can be requested to:

TECNOMEC AGRICOLA S.A. DE C.V.
Carr. a Paso Blanco, Km 2 No. 400
Col. Vista Hermosa, Jesús María
Aguascalientes, México. C.P. 20905
Tel. 01 (449) 922 47 66, 922 47 60
Fax 01 (449) 922 47 67

Hammer Mills MMRB20 and MMIB20, are designed to work safely, nevertheless, please consider the following:

Read this manual carefully to understand proper handling and maintenance of your hammer mill.

Write down its serial number in the warranty section to recover the machine in case of theft. Keep this manual in a safe place. Do not keep it in the machine.

A careful operator is the best guarantee against any accident since improper operation of this machinery may cause serious injuries or, even, death.

Before operating please make sure there are no individuals around the hammer mill.

Be careful when making adjustments and prevent accidents when handling the components of the hammer mill.

To achieve a more efficient and higher-quality milling, it's important to read and execute the adjustment & operation instructions of your hammer mill, since: a well lubricated implement, with the appropriate adjustments, saves time, labor and fuel.

Once finishing your work, clean and inspect your hammer mill to detect any possible flaw.

GENERAL INFORMATION

Tecnomec Agrícola offers original spare parts through authorized dealers. Our trained personnel, is well versed on methods to service your equipment. If you need additional information or custom assistance, please contact your Bison authorized dealership or directly to TECNOMEC AGRÍCOLA S.A. DE C.V.

**YOUR AUTHORIZED DISTRIBUTOR
TECNOMEC AGRÍCOLA, S.A. DE C.V.**

IT IS THE POLICY OF TECNOMEC AGRÍCOLA TO CONTINUOUSLY IMPROVE ITS PRODUCTS AND RESERVES THE RIGHT TO MAKE CHANGES TO ITS SPECIFICATIONS OR DESIGN WITHOUT INCURRING IN THE OBLIGATION TO APPLY THEM TO UNITS ALREADY SOLD.

CURRENT MODELS MAY VARY IN SOME DETAILS GIVEN CONTINUOUS IMPROVEMENT TO WHICH OUR PRODUCTS ARE SUBJECT.

*Some pictures show equipment that is not necessarily included as part of the standard machine.



INSPECTION LIST

PRE-DELIVERY INSPECTION MADE BY BISON DEALERSHIP

Once the hammer mill has been adjusted completely, check and ensure that it is ready for proper operation prior to deliver to customer. The following checklist is a reminder of checkpoints. Verify that each point is satisfactory and recheck once all proper adjustments have been made.

- Check that the hammer mill is properly assembled.
- Check that bolts, nuts and screws are tight.
- Check that the screws of the wheel maces are tightened properly.
- Check that all grease fittings are lubricated.
- Check that the assembly: expulsion elbow-cyclone is properly assembled.
- Connect the PTO y check the rotor operation. Check that the machine doesn't vibrate excessively nor makes strange noises.
- Clean the mill and retouch where the paint is peeled or scratched.
- Ensure that all labels and protective covers are properly fixed without damages.
- Ensure the machine has all features required by client.

Assembly Date _____ Name and Signature of Technician _____

INSPECTION LIST

DELIVERY BY BISON DEALERSHIP

The following list is an important reminder to be transmitted directly to the customer at the moment the hammer mill is delivered.

Check each point once it was duly explained to the customer.

- Point out to the Customer that useful life of this or any other machine is dependent of proper lubrication as described on its Operator's Manual.
- Hand your Customer the Operator's Manual and fully explain all operations, lubrication and maintenance adjustments.
- Explain the importance of a proper and safe operation of the machine. Stress the importance of labels, since those prevent the operator from hazards due to unsafe operation procedures and conditions.
- Notify the Customer of accessories and options available.
- When the hammer mill is transported on roads or highways during the day or night, you should use lights or safety devices to alert other vehicle drivers. Advise the Customer about the local town traffic local rules. We recommend using slow-moving vehicle emblem (SMV).
- Show the Customer how to mount the implement.
- Explain to the Customer the serial number registration of the hammer mill, in the blank space provided at the end of the Operator's Manual.
- Fill out the Delivery and Warranty forms, listing the serial number of the implement.
- Explain the Warranty, and perform a release form where the Customer and Distributor agree upon.
- The machine has been delivered ready to use, the customer has been informed about all the operation and care of it.

Delivery Date _____ Name and signature _____

OWNER REGISTRATION

Name _____

City _____

State _____

Serial Number _____

Model Number _____

Purchase Date _____

INSPECTION LIST

POST-SALES INSPECTION

It's advised that the following items are constantly checked during first hours of operation.

- Fully check the machinery and certify there are no damaged parts. Repair or change if necessary.
- Check that all safety covers shall be in place.
- Check there are no loose or missing screws.
- If possible, operate the hammer mill to verify it is functioning properly.
- Check the Operator's Manual in full with your Customer; emphasize the importance of a regular and proper lubrication, as well as safety precautions.

Inspection Date _____ Name and Signature _____

MORNING OPERATION INSPECTION

Lube all points in need of daily lubrication and those that require lubrication at a recommended time.

- Check that the strips tension is adequate.
 - Ensure that all screws are complete and that parts are tightened.
 - Check that all the pulleys are aligned one with respect to the other.
 - Check the wheels pressure.
 - Check that mounting components are safe.
 - Turn the feed hopper and verify there are no foreign bodies in the rotor area (loose screws, rocks, etc.). Additionally, check that the rods that support the hammers have their latches in good condition.
 - Ensure that the arrows are aligned one with respect to the other.
 - Grease all bearings or grease points that you consider the need to be lubed. Remember that excessive grease is harmful as well.
 - Turn the pulleys manually and verify that the rotor will not bind.
- ¡WARNING! Possible entanglement between strips and pulleys.

SEASONAL INSPECTION

- Check general state of the hammer mill (normal wear and tear, no bumps, no leaks in hoses, etc.).
- Ensure that proper lubrication has been made.
- Check the wheels pressure.
- Check that the hammers are not damaged or show abnormal wear. Verify that strips are in good condition.
- While mill is operating in a stationary position, verify the functioning of moving parts. Check any failure signal or operation and check there is no unusual vibration or noise.

HAMMER MILL SPECIFICATIONS

SPECIFICATIONS		MMRB20	MMIB20
Hitch type		Pull type	3-pt CAT II
PTO	(rpm)	540540	
Rotor working Speed	(rpm)	3,200	
Total Hammers Number		90	
Total Strips Number		6	
Number of Stoppers		2	N/A
Total Working Sacks Number		2	
Total Height	(in)	90.9	
Width	(in)	77.95	75.98
Long (with arrow shafts)	(in)	129.92	114.96
Cyclone's Wide Turning Circle	(in)	103.14	
Cyclone's Rotation	(°)	285	
Feed Hopper's Width	(in)	19.68	
Approximate Yield (Pasture)	(ton/hr)	1.5	
Approximate Yield (Grains)	(ton/hr)	1.5	
Standard Screens		2 (optional sizes)	
Approximate Weight	(lbs.)	1058.22	914.92

* Tecnomec Agrícola, S.A. de C.V. reserves the right to make any changes deemed necessary to the specifications without prior notice.

SAFETY RULES

SAFETY RULES

This is the safety-alert symbol which means **ATTENTION! BE ALERT! YOUR SAFETY IS INVOLVED!** This safety alert symbol indicates important safety messages in this manual. When you see this symbol, carefully read the message below and be alert to the possibility of personal injury or death.



DISTINGUISH SAFETY SIGNS

Whenever you see the words and symbols shown ahead and used in this manual, you **MUST** consider the instructions as they are related to personal safety.

DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in **DEATH** or **SERIOUS INJURY**.



WARNING: Indicates a potentially dangerous situation, if not avoided could result in **DEATH** or **SERIOUS INJURY**.



CAUTION: Indicates a potentially hazardous situation which, if not avoided, could result in **MINOR INJURIES**.



NOTE THE SAFETY MESSAGES

Before operating this equipment read all safety messages included in this manual and on your machine signs. It is **YOUR** responsibility to read and comprehend the safety section on this manual. Remember that **YOU** are key in following safety messages. Good safety practices not only protect you, but those who are nearby. Study all aspects of this manual and make them part of your safety program. Note that this section of security is only created for this type of equipment. Put into practice other procedures and above all usual precautions, **REMEMBER THAT SAFETY IS YOUR RESPONSIBILITY. YOU CAN AVOID SERIOUS INJURY OR DEATH.** This security section is meant to highlight some of the basic safety situations that may occur during normal operation and maintenance of this equipment, suggesting possible ways to handle these situations. This section does **NOT** replace the safety procedures that appear in other sections of this manual.



NOTE: This handbook covers general security practices for this equipment.

SAFETY RULES

PASSENGERS ARE NOT ALLOWED IN THE MACHINE

Only the operator is allowed on the machine. Passengers on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Passengers also obstruct the operator's view, resulting in the machine being operated in an unsafe manner.



HANDLE FUEL WITH SECURITY, AVOID FIRE

Handle fuel with care, it is flammable. Do not refuel while smoking or when close to flames or sparks. Always shut down the engine before refueling. Fill the tank outdoors.

Prevent fires by keeping the machine free of trash, grease and dirt. Always clean up spilled fuel.



BE PREPARED IN CASE OF EMERGENCY

Due to the flammable nature of many substances, there must be a fire extinguisher within reach of the operator.

Have on hand a first-aid kit for minor cuts and scratches.

Keep the local emergency numbers near you.



WEAR APPROPRIATE CLOTHING

Avoid wearing loose fitting clothing, use proper safety equipment according to the type of work.

The safe operation of the equipment requires full attention of the operator. Do not use headphones to listen music while traveling on roads. .



SAFETY RULES

STAY AWAY FROM MOVING ARROWS

The hook on rotating shafts may cause serious accidents and even death.

Shut down the engine and make sure that the arrow shaft stopped prior to:

- Connect or disconnect from PTO.
- Making any adjustment to the control or the PTO connection.
- Clean the equipment driven by the PTO.

Always keep the PTO main shield in its place, except for special applications as indicated in the machine Operator's Manual. Protections must rotate freely.

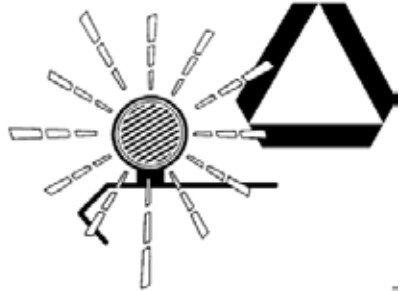
Wear close-fitting clothing. Stay away from the machine at a safe distance while the PTO is rotating.



USE SAFETY LIGHTS AND ACCESORIES

Slow vehicles, tractors, dragged or suspended equipment may present a risk to be transported or towed by road and hard to be seen, especially at night. Avoid injuries or death which may result from a collision with other vehicles.

We recommend using lights and safety accessories when driving on public roads. To improve visibility, use all the lights that the tractor has. Installing additional rotating warning lights is recommended. Verify that the pointing devices are in good condition. Immediately replace safety accessories and signaling devices if lost or damaged.



SAFE ACCESORIES STORAGE

The accessories that are not stored properly can fall and cause injury or death.

Store any accessories or equipment safely, avoiding falling objects. Keep away unauthorized minors and adults in the area.



SAFETY RULES

REMOVE PAINT BEFORE WELDING OR HEATING

Avoid inhalation of fume or potentially toxic dust.

Hazardous fumes can be generated when paint is heated by welding or when using a torch.

You must do all work outdoors or in a well-ventilated area. Dispose all paint and solvent properly, when necessary.
Remove paint before welding or heating.

- If you sand or grind the paint, avoid breathing the dust. Wear a protective mask.
- In case of using solvent, clean the treated surface with water and soap before welding. Remove the solvent, paint containers and other flammable material nearby. Allow the fumes to disperse at least 15 minutes before welding or heating.



PROTECTION AGAINST NOISE

Prolonged exposure to noise can affect hearing sense.

As a precaution, protect your ears with ear muffs or plugs.



SECURITY DECALS

OPERATOR'S MANUAL

Read carefully the Operator's Manual before operating the Hammer Mill. If you don't understand any section of this manual, please contact your dealership for any questions that may arise.

The Operator's Manual provides instructions about safety, operation, maintenance and service for the machinery.

An additional copy of the Operator's Manual will be needed if the original one, which was provided with the machine, is lost.



OPERATION SPEED

Never use a tractor that offers more than 540 RPM PTO output.

Turn on the tractor, accelerating from less to more until you reach 540 RPM PTO output, for the optimum functionality of the hammer mill. Doing this we achieve that the contact between the tractions parts gets done in a mild way. Failure to do so may damage the arrow shafts, pulleys, bearings and the mill rotor.



▲ ATTENTION: Never operate the hammer mill with a tractor that offers more than 540 RPM PTO output, since the hammer mill is designed to operate under these conditions.

SECURITY DECALS

ARROW SHAFT

Stay away from the arrow and all rotating shafts, while operating the Hammer Mill.

The covers should rotate freely.

Do NOT operate this equipment without the protections on the power shaft and the rod universal joint. Make sure that the protective covers are well placed.

ROTOR

Never lift up the feed hopper if the Hammer Mill is operating.

Make sure that the hammers and rods are in good condition.

Verify that the Hammer Mill is not damaged and that there are not missing screws.

Wear appropriate protection and clothing when operating the Hammer Mill, since some part of the material being ground could be ejected and could hit the operator.

STRIPS AND PULLEYS

Verify that the strips and pulleys are in good condition.

Stay away from strips and pulleys when the Hammer Mill is operating.

Keep the guards in good condition and in their designated place.



SECURITY DECALS

READ CAREFULLY THE SAFETY SIGNS

Read carefully all the safety signs as WARNING, DANGER AND CAUTION. Keep the safety signs in good conditions. Replace the damaged or lost decals.



WARNING DECAL

The WARNING decal is located on the trailer.

On the Hammer Mill MMIB20, this decal is located on the pulleys guard.



SECURITY DECALS

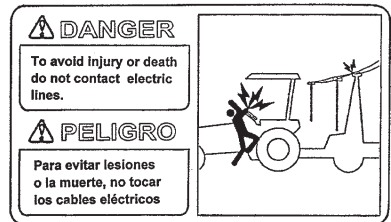
WARNING DECAL

This decal is located on the Feed Hopper.



DANGER DECAL

The DANGER decal is located on the ejection elbow.



SECURITY DECALS

CAUTION DECAL

The CAUTION decal is located on the Feed Hopper.



DANGER DECAL

The DANGER decal is located on the pulleys guard upper side.



SECURITY DECALS

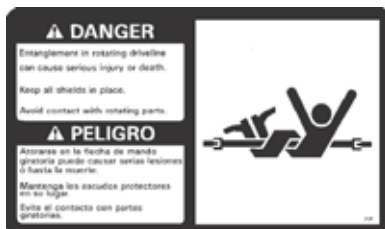
DANGER DECAL

The DANGER decal is located on one of the Feed Hopper's side.



DANGER DECAL

The DANGER decal is located on the outside of the guard.



SECURITY DECALS

ROTOR HAMMERS SETTING DECAL

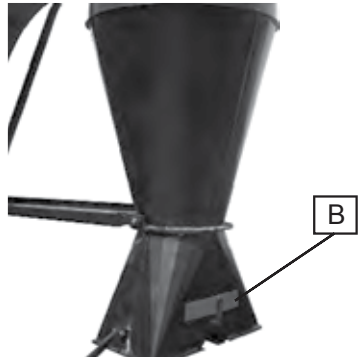
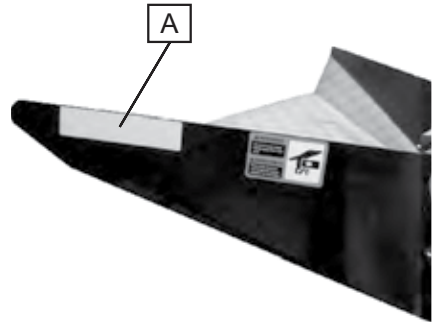
This decal is located on the pulleys guard upper side.



REFLECTIVES

There are 3 red or yellow decals that reflect the light, and their function is to prevent the drivers against a possible crash when passing by the Hammer Mill.

They are located on the Feed Hopper (A) and on the cyclone (B).



OPERATION

PULL BAR

These mills need a 540 rpm PTO. Refer to the image to obtain the correct system dimensions of 540 rpm needed to operate this equipment. These standards have been defined by the American Society of Agricultural and Biological Engineers (ASABE).

The Trailer Pull type, Hammer Mill **MMRB20** needs to be installed on a tractor with a CAT II pull bar setting.

Tractor's Pull Bar and PTO dimensions:

(A) 14 inches from the tractor's end of the shaft PTO to the middle of the hitch pin hole.

(B) 8 to 12 inches from the top of the pull bar.

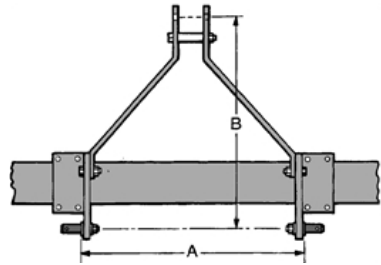
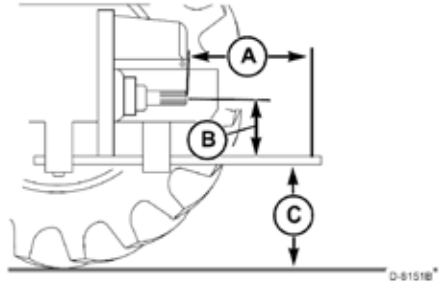
(C) 13 a 20 inches from the ground to the pull bar.

The Three-Point Hitch Hammer Mill **MMIB20** needs to be installed on a tractor with a three-point lift system, CAT II.

CAT II:

"A and B" should approach as close as the following measures:

- A measure = 32.5 inches
- B measure = 24 inches



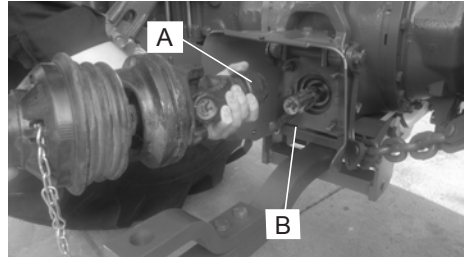
OPERATION

HITCH THE ARROW SHAFT TO THE PTO

HITCH

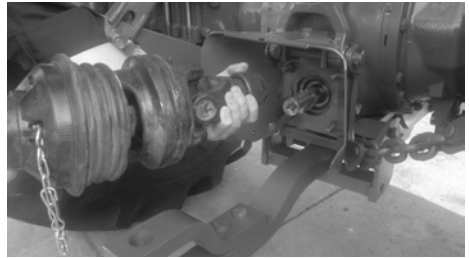
IMPORTANT: Keep the hitch streaks and the strength axis clean, without paint or dirt.

To hitch the power line, connect the universal joint of the rear telescopic hitch (A) to the PTO (B), pressing the pin and then release it.



To hitch the arrow shaft to the arrow drive pulley, slide the u-joint into the arrow motor pulley and tight the cradle with the oppressors.

⚠ ATTENTION: After the mill has been connected correctly to the PTO and to the arrow motor pulley, replace the protective covers back, including the main one, just in case it was removed during the tractor PTO connection.



HOW TO UNHOOK THE ARROW SHFAT FROM THE PTO

IMPORTANT: Keep the PTO & front axle hitch scoring marks clean without paint or dust.

⚠ ATTENTION: Follow the shaft bar unhook process securely as described below.

1. - Turn off the tractor engine.
2. - Press the bolt and pull back to remove the shaft arrow from the tractor's PTO.

ARROW SHAFT OPERATING ANGLE

IMPORTANT: The arrow shaft optimum and normal operating angle will depend on the tractor type and the pulling bar height from the ground.

For the arrow shaft to work in a normal operating angle, it must form an angle (C) less than or equal to 15° with respect to the PTO horizontal.



The gear ratio between the pulleys is 6 to 1, that is, as the tractor delivers 540 rpm at the PTO output, then the rotor pulley (small) rotates at 3200 rpm. If you use a tractor that delivers more than 540 rpm at the PTO output then the rotor would rotate at more than 3200 rpm, this may cause an accident and serious damage to the Mill. This restriction also applies to the MMIB20 mill.

⚠ ATTENTION: Never operate the hammer mill with a tractor that offers more than 540 RPM PTO output, since the hammer mill is designed to operate under these conditions.

OPERATION

ARROWS ALIGNMENT

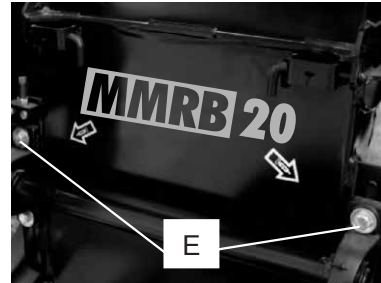
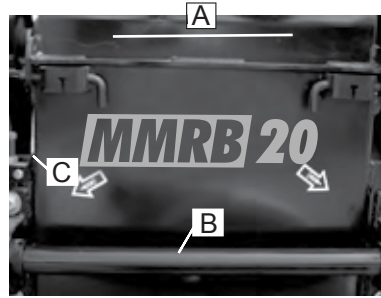
IMPORTANT: Ensure that the bearing screws are tight once that the arrows have been aligned. The arrows must be aligned because it depends on this that the pulleys are also aligned.

To align the arrows take as a base the line that is formed at the top of the drawer (A), then the arrow (B) of the pulley must be aligned with respect to this line.

To align the arrow, loosen the bearing screws (E), push them down and tighten them partially, to refine the alignment turn the screw (C) clockwise.

To ensure that the arrows are aligned, use a square and make sure that the distances (F) and (G) are equal.

⚠ ATTENTION: Verify that the bearing screws are tight, once that the arrows have been aligned.



OPERATION

PULLEYS ALIGNMENT AND STRIPS TENSION

IMPORTANT: The strips must have some tension so that the PTO's power transmission is adequate.

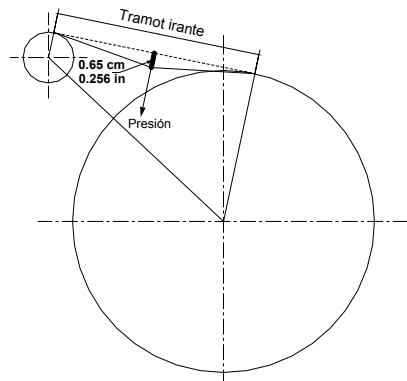
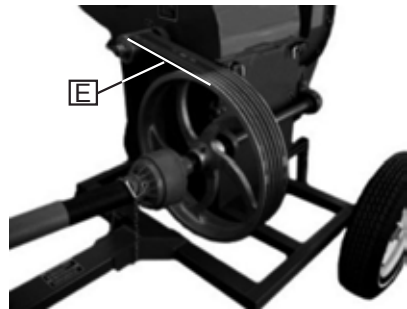
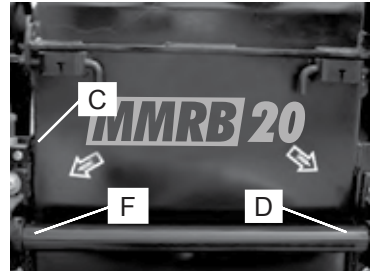
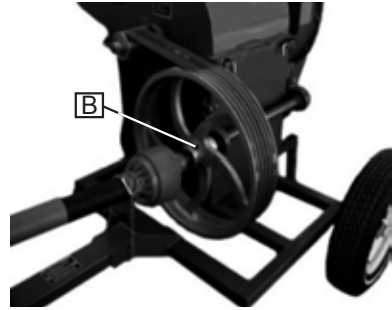
The pulleys must be aligned one with respect to the other, otherwise they can pull outside, besides its useful life reduces.

To verify that the pulleys are aligned, loosen the screws and remove the guard, use a square or rule (E) with enough length to support it simultaneously on the pulleys flat faces, ensure if they are aligned correctly. If necessary loosen the oppressors (B) and move the pulley until it's aligned with respect to the other. Once they are aligned, tighten the oppressors again.

Once you have aligned the strips and pulleys, you have to tighten the strips. To perform this process loosen the bearing screws (D), push it down and tighten them once again, then loosen the bearing screws (F) and turn the oppressor (C) clockwise until the arrow is aligned with the top of the drawer. then tighten the bearing screws (F) and verify if the tension is adequate (0.256 in deflection), place the guard back and if the tension is not adequate, repeat the process once again.

Tighten the strips until the tier section deflection is at 0.256 in. To verify the previous, press with one of your thumbs, on the middle of the tier section and measure with a rule the deflection. If the resulting value is less than 0.256 in, loosen the strips a little bit and if the higher, then tighten the strips.

⚠ ATTENTION: DO NOT align the pulleys loosening the bearing oppressors and moving the pulley drive arrow since this may damage the arrow shaft operating angle.



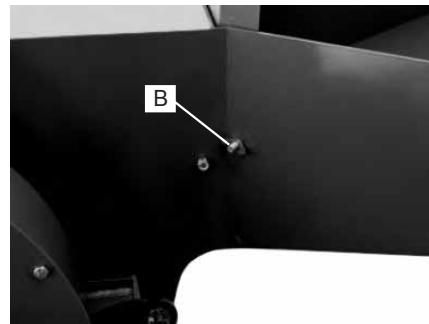
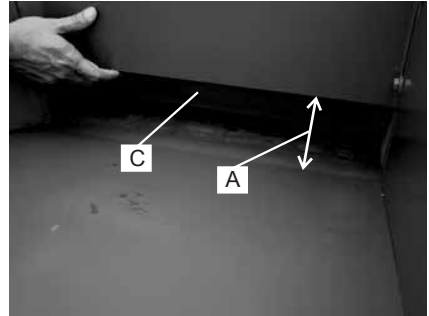
OPERATION

FEED HOPPER OPENING REGULATION

The part that controls the feeding also has the function of preventing the mill from getting stuck. The feed hopper opening (A) will be regulated according to the material to grind.

To grind pasture it opens to the maximum. To grind grains, regulate the opening according to what you observe, that is, if you see that at the time of adding the grain the Mill gets stuck or a high quantity of grains are rejected, then lower the gate until you see that this does not occur anymore. To regulate the feeding opening (A), loosen both screws (B) located on the upper front part of the gate, close or open the gate, according to your needs, and tighten the screws.

Try not to remove the swing gate (C) if it's not necessary; if you do so, make sure that it gets placed back.



⚠ ATTENTION: When you regulate the Feed Hopper opening, be very careful not to drop any screws into the rotor, as this can cause serious damage to the mill.

Never remove the folding gate when the mill is under operation.

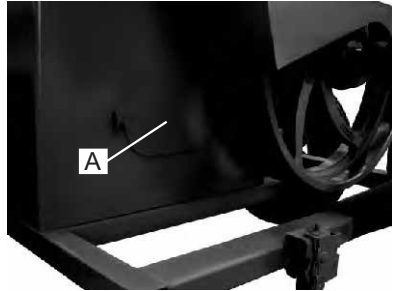
⚠ DANGER: Do not adjust the gate of the material inlet and do not remove the folding gate while the mill is under operation. Also, check that there are not foreign bodies in the rotor area. (Screws, pins, rocks, etc.)

OPERATION

AIR INTAKE REGULATION OF THE RECEPTION TRAY

When the grain is been ground, generally the volume of air pulled by the fan is reduced. For this reason, it is very important to allow the air intake through another part of the mill so that the fan functions correctly. When pasture is being ground this situation does not occur.

To increase the air intake, loosen the wing nut that holds the gate (A), turn the crate door where necessary and re-tighten the wing nut.



⚠ ATTENTION: Once the mill operation is finished, replace the gate back.

⚠ DANGER: Do not adjust the air intake regulating gate while the mill is under operation.

ORIENTATION OF THE CYCLONE

⚠ ATTENTION: When you have finished the operation and need to transport the mill on a road, do not forget to reorient the cyclone backwards and tighten the screws. Otherwise it can cause a serious accident since the cyclone can turn without restriction and could hit any vehicle.

Depending on the needs that arise at the time of transport or operation of the mill, the cyclone's angular position can be modified. To turn the cyclone, loosen the screws (A) based at the extension's base, turn the cyclone to the desired position and re-tighten the screws. If in the grinding operation you need to modify the position several times, then do not fully tighten the screws so that it allows the rotation without difficulty.



OPERATION

TIRES PRESSURE

Only for Mill MMRB20

IMPORTANT: Both tires must have the same air pressure.

Proper inflation is essential for a long tire life. The lack of air pressure allows the tire to slip on the rim and the side walls to deform, resulting in broken stems and uneven wear of the tread. Too much pressure undue effort produced in the structure of the tire and may result in breakage due to impact with stones, roots or logs. It also causes excessive wear of the tread and allows tires to bury more in wet terrain.

Keep the valve plugs tightened on the valve stems. This will prevent dust, gravel, mud and other foreign matter from entering to the core of the valve, allowing the compressed air to escape.

Frequently check the tire pressure with a pressure gauge (A) and inflate or deflate them for correct air pressure as it is given in the following table:

GRADE	PRESSURE
175/70R13	kpa (240) psi (32)

⚠ ATTENTION: Tires can lose one pound per square inch of pressure (1psi) per month under normal conditions, and by every 6 degree Celsius that the temperature falls.

DANGER: If the screen breaks, some fragment that comes off can be ejected and can result in death or serious injury.



SCREENS SELECTION

IMPORTANT: Replace the screens before they break, as any fragment that comes off could damage the Mill in general.

Wear gloves whenever you change the screens. Depending on what you want to grind (grains or forage), you will use screens with holes of different diameter.

Below is a table of the screens and their use:

HOLES SPECIFICATIONS	USAGE
12 mm diameter	Dry Forage
6 mm diameter	Grains

If you need an specific hole diameter in screens, for grinding a particular grain, check pages 53 and 54 or consult your authorized dealer.

⚠ ATTENTION: Each screen has its own usage. If you do not apply this principle you will get bad results when grinding.



OPERATION

Once all the necessary adjustments have been made according to the Operator's Manual, the operation of the mill can be started as follows:

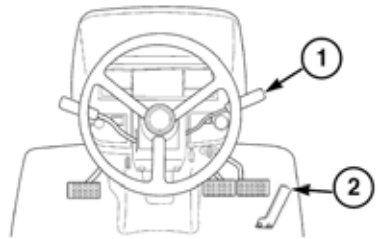
1. Place the sacks in each of the outputs of the bagger. Turn the handles (A) to hold the sack. Orient the baffle so that the sack you want gets filled first.
2. Turn on the tractor, accelerating with the lever (1) or pedal (2) slowly until it reaches 540 RPM to PTO output. With this we achieve that the contact between the different pieces of traction (arrow shaft, motor pulley arrow, driven pulley arrow, bolts and hammers) is carried out in a smooth way. Otherwise, it can damage the Mill in general.
3. When the tractor moves to the next pile of material to be ground and has to turn because it encountered an obstacle (rock, tree, vehicle, etc.), do not perform the operation (turn) abruptly as it may twist the arrow shaft or damage the bearings.

You must make the turns in such a way that this problem is avoided. It would be advisable to uncouple the arrow shaft to avoid damaging it. If you operate the Mill in stationary form (without tractor feed) you will not have the above problem, unless the Mill and the tractor are not aligned.

NOTE: If you operate a MMIB20 Mill: Verify that the chassis legs are supported firmly on the ground on which it is going to work. If it's necessary to move, lift the mill enough with the hydraulic system so that the legs do not make contact with stones, shrubbery, terrain irregularities, plant waste, etc. with which it may come across on the way.

IMPORTANT: Do not move the mill with the chassis resting on the ground; this would cause damage to the structure.

CAUTION: If it's necessary to move the Mill, unplug the PTO and to take closed turns with the MMRB-20 Mill, disconnect the arrow shaft in order to avoid damaging it.

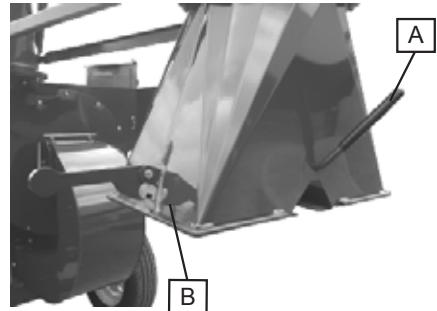


OPERATION

4. Add the material to grind, in such a way that the Mill's rotor does not saturate. Be very careful that when picking up the material to grind (pasture or grains) it does not carry stones, wood, metals or foreign materials, since the Mill can be damaged in general, besides that it can cause a serious accident. If the material that is been ground is packed in sacks, use extreme caution not to approach them close to the rotor because they could be sucked along with the person who is performing the operation.



5. Once that the sack has been filled, turn the rod (A) to change the baffler direction. If this movement is not done, the cyclone will clog, needing to stop the Mill operation. The sign that the cyclone has been clogged is that the ground material starts to be ejected from the upper opening of it.



6. Remove the full sack, moving the handles (B) so that the sack frees. If at the time of the Mill operation A full sack is hanging on the bagger, there is a risk that the cyclone gets clogged.

7. Place a new sack and repeat steps 5 and 6.

⚠ ATTENTION: Be very careful when feeding the Mill if the feed opening is too wide or you have removed the folding gate.

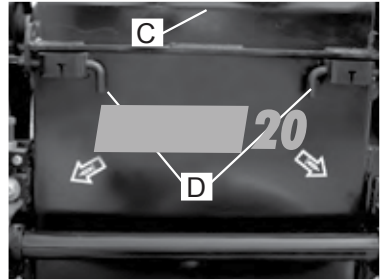
The material to grind must be dry in order to avoid clogging.

MAINTENANCE

HAMMERS REPLACEMENT

The hammers need to be changed once they have worn to such an extent that the vibration increases and the Mill becomes inefficient. The steps to change the hammers are the following:

1. Turn the Feed Hopper (C). To perform this operation, pull and turn any of the security bolts (D), until they are located as shown in the image. Repeat the operation with the second bolt.

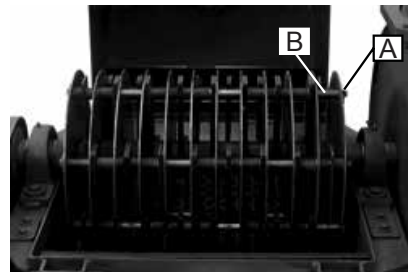


Stand on the opposite side and remove the lock (E). Slowly press the Feed Hopper from the entry point until it rests on the tire.



2. Remove the screw and lock nut (A) from the rod (B) and pull it slowly while you remove the spacers and hammers. Leave all the removed pieces in an ordered way so that the assembly operation is not complicated. Repeat the operation with each rod.

3. Weigh one of the arrows with all its components (cotter pins, hammer spacers) and use this weight as a basis. Each of the rods, with their components, must have the same weight. To achieve this, add rounds (these must be distributed along the rods). This is made to avoid rotor vibration.



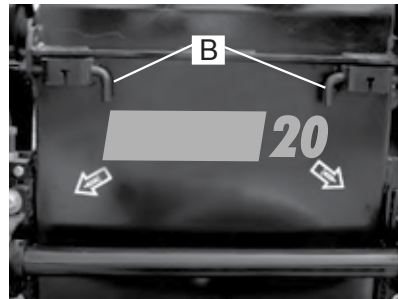
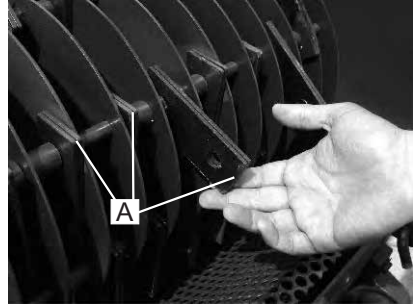
MAINTENANCE

4. Change or reverse all the hammers (A) as the case may be and put the pieces back in place, starting with the last one removed. Since the hammer has 4 corners, you can reverse the hammers 3 times before replacing them for new ones.

5. Repeat steps 2 and 3 for the next 5 arrows.

6. Return the feed hopper and replace the security bolts (B) and the lock on the original position.

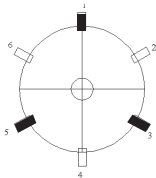
⚠ ATTENTION: Whenever you replace or reverse any hammer, disconnect the arrow shaft from the PTO and wear gloves to perform this operation.



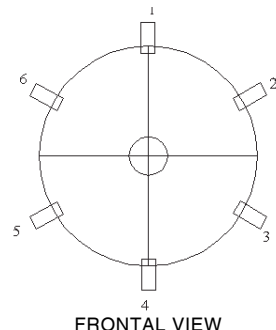
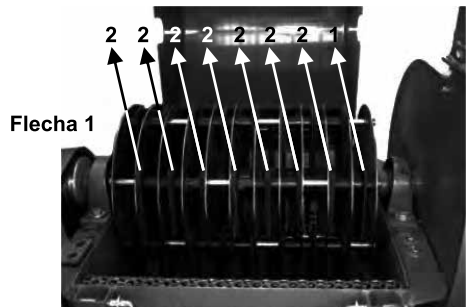
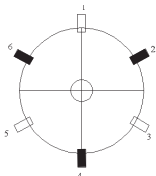
HAMMERS DISTRIBUTION

To maintain balance in the rotor and to prevent the hammers from colliding with each other, they are located in a strategic way. Each row has 15 hammers, in total there are 90 hammers on 6 arrows.

The arrangement of the hammers on the arrows 1, 3 and 5 is 2, 2, 2, 2, 2, 2, 2, 1 from left to right, resulting 15 in total.



The arrangement of the hammers on the arrows 2, 4 and 6 is 1, 2, 2, 2, 2, 2, 2, 2 from left to right, resulting 15 in total.

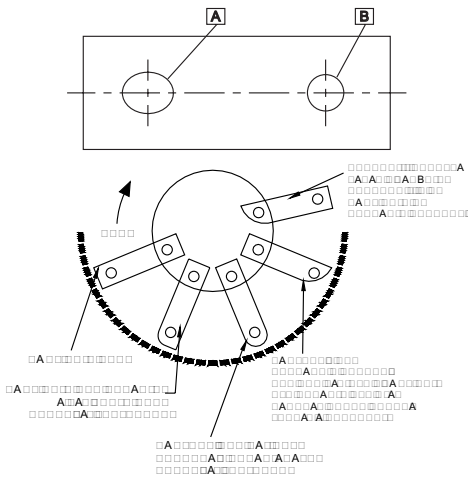


MAINTENANCE

DAMAGE AND WEAR IN THE HAMMERS

Sometimes the hammers can be damaged before the 4 corners wear out due to the deformation of the hole through which the rod passes. The upper figure shows a hammer with the damaged hole (A) and the hole (B) in good condition. In this case it is necessary to invert the hammers.

The different wear stages of the hammers are shown in the figure. The hammer reaches a point where the wear requires the hammer to be replaced before flare problems arise. If you perform this operation on time (reversal) you can use the 4 corners of the hammer, otherwise, the flared hammer will cause the Mill to vibrate in excess.



SPACERS DISTRIBUTION

The spacers have the function of keeping the hammers in place, to prevent these (hammers) from colliding with each other.

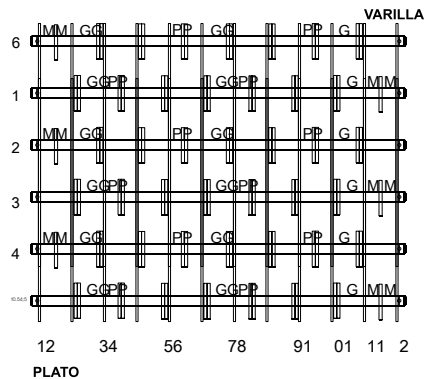
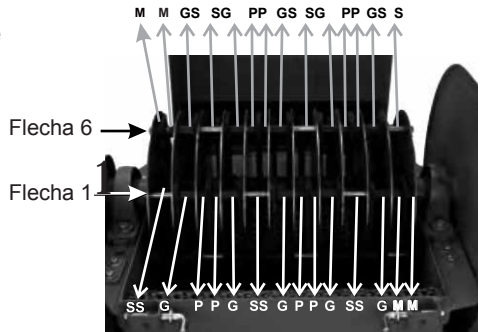
The distribution is the following:

- SS --- Without spacer
- G ---- Large spacer
- P ---- Small spacer
- M ---- Medium spacer

The arrows 1, 3 y 5 have the same spacer's arrangement.

The arrows 2, 4 y 6 have the same spacer's arrangement.

NOTE: This graph is reproduced in the HAMMER'S ROTOR SETTINGS decal (See page 17).

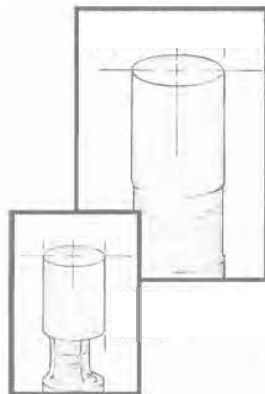


MAINTENANCE

DAMAGE ON THE ARROWS

The rods where the hammers are mounted can get worn to the point that it is necessary to replace them.

⚠ ATTENTION: Never operate the Mill if a hammer is missing. If you reverse hammers and some are flared, invert them all using the hole that is not flared. All this to prevent the Mill from vibrating excessively and may damage the rotor.



MAINTENANCE

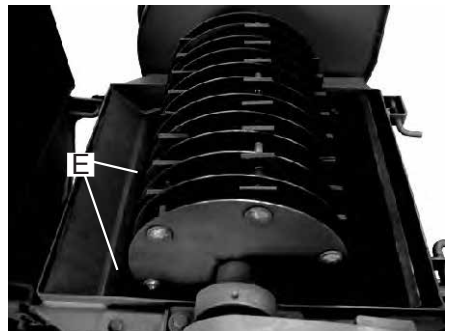
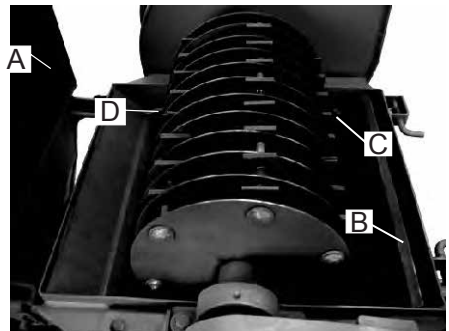
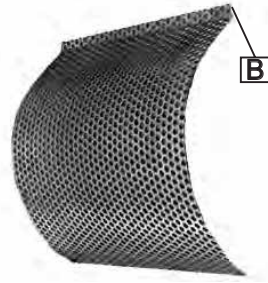
SCREENS REPLACEMENT

The screens are changed when they have worn so much that they are about to break or when you are going to grind a different material to the one that is specified for the screen that is set.

The steps to change the screens are the following:

1. Turn the feed hopper (A).
To perform this operation, pull and turn any of the security bolts.
Repeat the operation with the second security bolt.
Stand on the opposite side and remove the lock.
Slowly press the feed hopper from the point of entry of this until it rests on the tire.
2. Verify that the screen is not bent or blocked with some of the flanges, guides or hammers.
3. Pull the screen from its fold (B). If the screen does not come out, with the help of a piece of wood, push it slowly from the opposite side and pull it again until it comes out.
4. Place the screen that you want to use, being careful to slide it only between the guides (C) and the flange (D), not over them as it can get stuck, resulting very difficult to remove it since the hammers will hold it.
5. Push the crib until it hits the stop (E).

⚠ ATTENTION: When placing the screens you must be careful with your hands (wear gloves). Once the screen is supported on the flanges, push it gently so that when it reaches the stops, you can remove your fingers to avoid an accident.

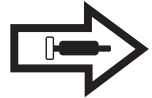
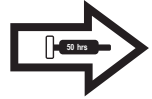


MAINTENANCE

NOTE THE LUBRICATION SYMBOLS

For your Mill lubrication, use bearing grease based on Lithium EP-2, in hour intervals indicated in these symbols.

Regularly brush the arrow shaft with Lithium EP-2 grease.



MAINTENANCE & LUBRICATION

⚠ ATTENTION: Do not clean, lubricate or adjust the machine while it is in motion.

IMPORTANT: Recommended intervals are based on normal working conditions. Severe or unusual conditions may require more frequent lubrication intervals.

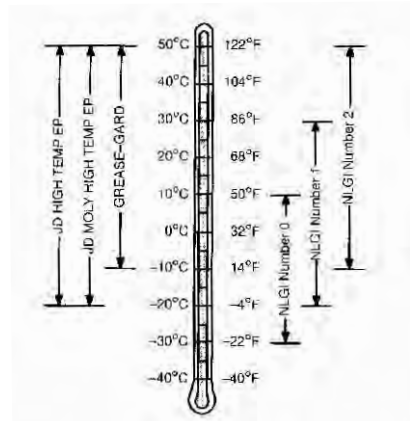
Perform each of the lubrication and service procedures illustrated in this section at the beginning and at the end of the season.

Clean the grease fittings, before lubricating, with a grease gun. Replace all broken or lost fittings immediately. If a new grease fitting does not accept grease, remove it and check nearby parts for damage.

LITHIUM-BASED GREASE FOR BEARINGS

Choose the most suitable type of grease according to the NLGI consistency and the temperatures that may be present in the interval until the next grease change.

You can use any grease that meets the following standard: NLGI GC-LB.



MAINTENANCE

ALTERNATIVE AND SYNTHETIC LUBS

The conditions of certain geographical areas may require the use of lubricants or special lubrication techniques that are not listed in the Operator's Manual.

In this case, contact your dealer, who will provide you with the most up-to-date information and recommendations.

Synthetic lubricants may be used if they meet the specifications indicated in this Operator's Manual.

The temperature limit values and service intervals indicated in this manual refer to both conventional lubricants and synthetic lubricants.

SAFETY WHEN LUBRICATING THE MILL

IMPORTANT: The good lubrication of your machine carried out in each place and in the periods indicated in this manual, with the recommended greases, will increase the useful life of your machine.

Neglecting the above can cause failures, along with losses of time and money.

Do not clean, lubricate or adjust the machine while it is in motion.

Prior to maintenance, please perform the following steps:

1. Turn off the engine.
2. Disconnect the PTO.
3. Wait until the rotor has stopped spinning.

MAINTENANCE

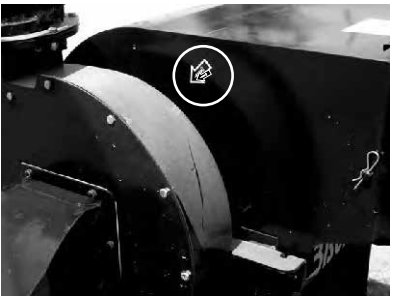
BEARINGS

Every 50 hours

Clean and lubricate the rotor shaft's grease fittings and the ones of the side shaft.

Use quality EP-2 grease based on lithium and containing no more than 1% molybdenum disulphide (heavy duty grease or equivalent).

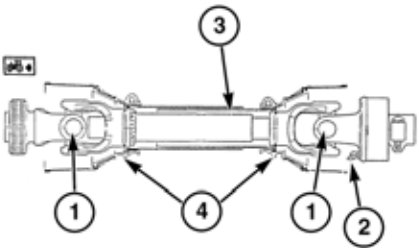
If necessary, lubricate the bearings before each working day. Remember that grease excess is also harmful.



ARROW SHAFT

Every 8 hours

Lubricate all the grease fittings with quality EP-2 grease based on lithium and containing no more than 1% molybdenum disulphide (heavy duty grease or equivalent).



MAINTENANCE

WHEEL BEARINGS

(Only for MMRB20 Mill)

Every 6 months

Remove the wheels, repack and adjust the bearings. Use all-purpose lubricants or equivalent SAE multi-purpose grease or wheel bearing grease.

If your machine will remain inactive for a long period of time, disassemble the tires and keep them in a safe place.



RECOMMENDATIONS

FUNCTIONING

⚠ ATTENTION: Never operate the hammer mill with a tractor that offers more than 540 RPM PTO output.

Perform all adjustments and maintenance referred in this Operator's Manual prior to operate the Mill.

When changing the hammers, verify that they all have the same dimensions and that they remain in the order indicated in this Operator's Manual. Never adjust or change hammers when the Mill is under operation.

Wear appropriate clothing. Never wear loose clothing, as it could be sucked by the Mill rotor. Wear lenses, since the hammers could expel some material that is being ground.

If you remove the guards to tighten the strips, replace them back in order to avoid possible accidents.

If you hear any strange noise while operating the Mill, stop it immediately and check what the problem is.



RECOMMENDATIONS

TRANSPORTATION

When you have finished the operation and need to transport the Mill on a road, do not forget to place back and tighten the screws (A) located at the extension's base. Otherwise it can cause a serious accident since the cyclone can turn without restriction, hitting any vehicle.

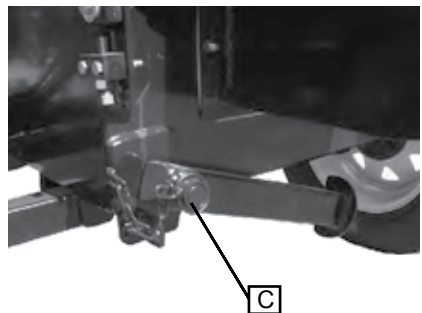
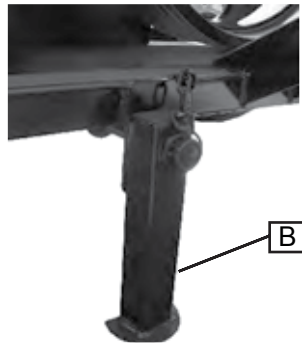
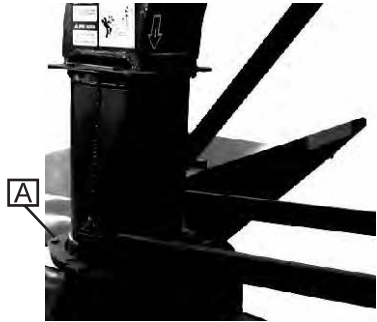
⚠ ATTENTION: Verify that the arrow shaft is unplugged from the PTO, and is secured to the trailer before transporting the Mill. If you are using the seats (B), lift them up and secure them with the bolts (C) to the trailer.

⚠ ATTENTION: Make sure that the trailer brakes work correctly prior the transportation, tow the Mill only with an agricultural tractor. The towing speed must never be greater than 6 mph.

⚠ ATTENTION: The MMRB20 Mill must not be transported on road at speeds exceeding 9 mph.

NOTE: If you operate a MMIB20 Mill: Check that the chassis legs are firmly supported on the ground on which it is going to work. If it's necessary to move, lift the mill enough with the hydraulic system so that the legs do not make contact with stones, shrubbery, terrain irregularities, plant waste, etc. with which it may come across on the way

IMPORTANT: Do not move the mill with the chassis resting on the ground; this would cause damage to the structure.



RECOMMENDATIONS

STORAGE

When storing the Mill, remove the forage, grains and mud adhered.

Lubricate all the Mill parts referred on the Operator's Manual.

Place wooden blocks under the Mill to relieve the weight on the tires and then deflate the tires.

If the Mill is going to be left outdoors, do not deflate the tires, but cover it completely to protect it from the environment.

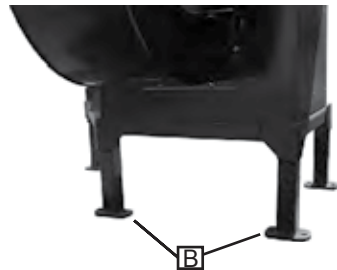
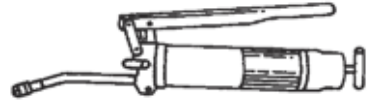
Lower the 2 stalls (A) and secure them with the bolts, to avoid the Mill overturning.

For MMIB20 Mill: Make sure that the 4 chassis legs (B) lean on the ground.

Decrease the strips tension.

Protect the hammers from corrosion by applying a light coat of oil or grease.

When the Mill is stored for a long period of time, apply a good anticorrosive, which is available with your authorized dealer.



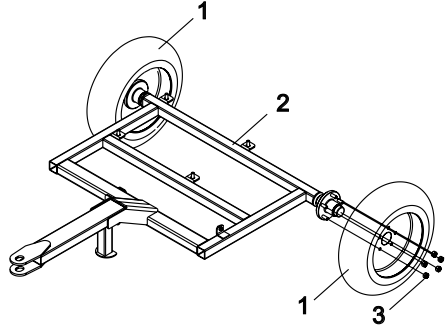
COMMON FAILURES AND POSSIBLE SOLUTIONS

Problem	Possible Cause	Solution
Inadequate size of forage or milled grains.	Incorrect screen usage. Low RPM's to PTO. Hammer's excessive wear.	Change the specified screen for that usage. Verify that the engine delivers 540 RPM to the PTO. Change or reverse the hammers.
Greater power is required.	Inadequate tension in the strips.	Tense the strips according to specifications.
Mill clogging.	Low RPM to PTO. Poor regulation of air intake. Hammer's excessive wear. Excessive supply of material to be ground.	Verify that the engine delivers 540 RPM to the PTO. Verify that the air intake does not have obstacles. Change or reverse the hammers. Dispense the material properly and regulate the Feed Hopper opening.
Excessive vibration.	Misplaced hammers. Flared hammers or with different dimensions. Bearings with untightened screws. High RPM's to the PTO. Motor pulley imbalance.	Check that the hammers are placed correctly, in the proper amount. Check that all the hammers are the same without being damaged. Check that all the bearing screws are tightened. Verify that the engine delivers 540 RPM to the PTO. Balance the motor pulley with counterweights.
Strips excessive wear.	Mixture of old strips with new ones. Non-twinned strips.	Replace all the strips at the same time. Change the batch for one with sister strips.
Heating of bearings.	Misplaced arrows and bearings. Low or null lubrication. Excessive strips tension.	Align the bearings and arrows. Apply enough grease. Tense the strips according to specifications.
Deformation and / or crushing wedges.	Very fast empty start.	Change wedges and tighten the oppressors.
Excessive turbulence of the output product.	Poor regulation of air intake.	Regulate the air intake with the folding gate.

ASSEMBLY

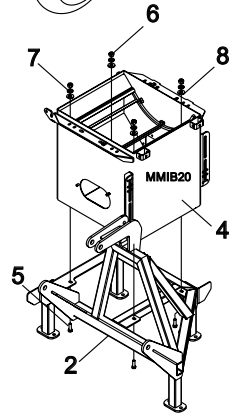
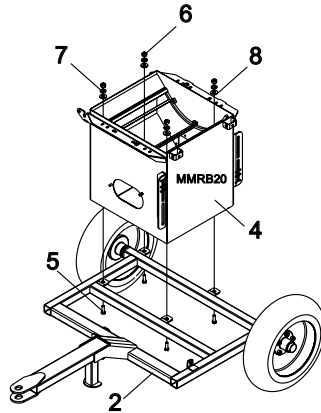
1. - Assemble the tires (1) on the trailer frame (2).
- Tighten all the nuts (3) according to the Torque Table on pages 57 and 58.

1. - Wheel
2. - Trailer Frame
3. - 1/2" Automotive Nut



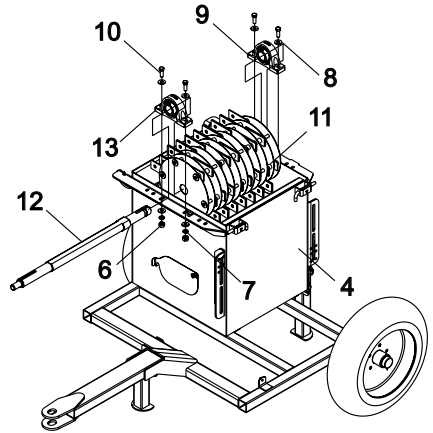
2. - Assemble the Drawer (4) to the trailer frame or chassis (2). Use the screw (5), the nut (6), the pressure washer (7) and the flat washer (8).

2. - Trailer Frame (MMRB20) Chassis (MMIB20)
- 4.- Drawer
- 5.- Hex. Screw 1/2" X 1-1/2"
6. - Hex. Nut 1/2"
7. - Pressure Washer 1/2"
8. - Flat Washer 1/2"



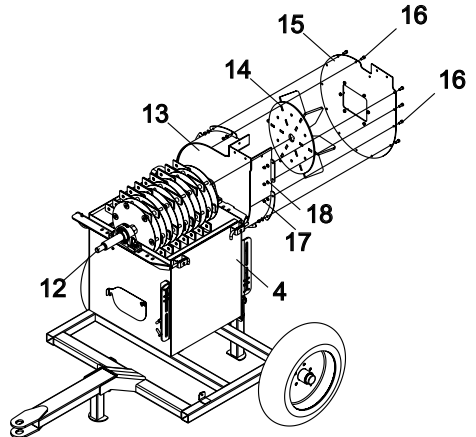
ASSEMBLY

3. - Assemble the central shaft (12) into the hammers rotor (11). Place the bearings (9) on the ends of the central shaft and position the hammers rotor inside the Drawer. (4) Assemble the bearings to the Drawer. Use the screw (10), the Nut (6), the pressure washer (7) and the flat washer (8).



- 4. - Drawer
- 6. - 1/2' Hex. Nut
- 7. - 1/2' Pressure Washer
- 8. - 1/2' Flat Washer
- 9. - 1 - 5/8' Floor Bearing
- 10. - 1/2' x 2' Screw
- 11. - Hammers Rotor
- 12. - Central Shaft

4. - Assemble the Fan Box (13) over the Drawer (4). Set in the Fan (14) over the opposite side of the Central Shaft (12) y place the Cap (15) adjusting with the screw (16), the nut (17) and the pressure washer (18).

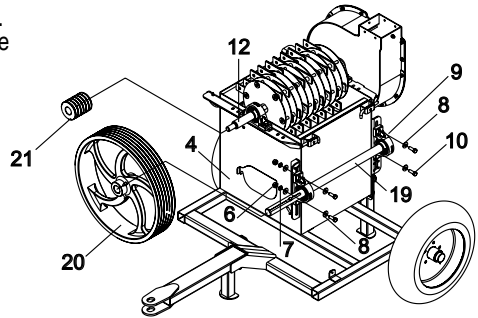


- 4. - Drawer
- 12. - Central Shaft
- 13. - Fan Box
- 14. - Fan
- 15. - Cap
- 16. - 5/16' x 3/4' Hex. Screw
- 17. - 5/16' Hex. Nut
- 18. - 5/16' Pressure Washer

ASSEMBLY

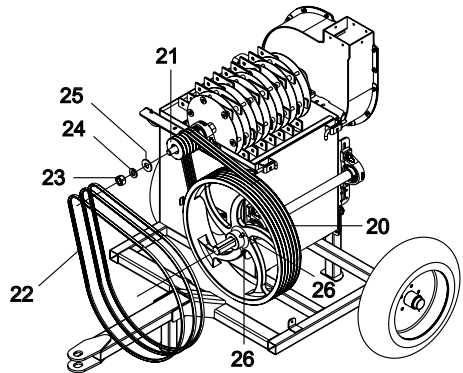
5. - Assemble the second pair of bearings (9) over the Drawer (4). Use the screw (10), the nut (6), the pressure washer (7) and the flat washer (8). Move the Side Arrow (19) through the bearings (9). Place the pulley (20) over the end of the Side Arrow (19). Additionally, place the pulley (21) over the end of the Side Arrow (19).

- 4. - Drawer
- 6. - 1/2" Hex. Nut
- 7. - 1/2" Pressure Washer
- 8. - 1/2" Flat Washer
- 9. - 1" - 5/8" Floor Bearing
- 10. - 1/2" x 2" Screw
- 19. - Side Arrow
- 20. - 23" 3/4 6-12 Pulley
- 21. - 4 6-R Pulley



6.- Place the strips (22) over the pulleys (20 & 21) (Pulleys alignment and strips tension methods are described on page 21). Use the nut (23), the pressure washer (24) and the flat washer (25) to secure the pulley (21) on the Arrow shaft. Secure the pulley (20) to the Central Shaft with the oppressors (26).

- 20. - 24-3/4 6-R Pulley
- 21. - 4 6-R Pulley
- 22. - B86 Strip
- 23. - 1" Hex. Nut
- 24. - 1" Pressure Washer
- 25. - 1" Flat Washer
- 26. - 3/8" x 1" 1/4 Squared Head Oppressor



ASSEMBLY

7. - Assemble the Tensor Body (27) over the Drawer (4) with the screw (28). Adjust the Oppressor (29) with the Nut (6).

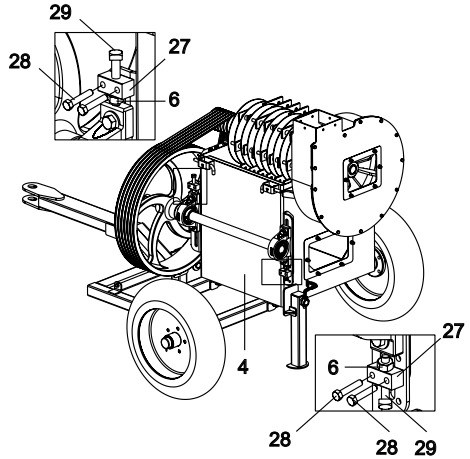
4. - Drawer

6. - 1/2" Hex. Nut

27. - Tensor Body

28. - 5/16 x 2 Hex. Screw

29. - 1/2 x 3 Squared Head Oppressor



8. - Place the Screen (58) sliding it through the lower side of the Hammers Rotor (11) using the guide stops located on the inner walls of the Drawer (4).

Assemble the Feed Hopper (30) over the Drawer (4). Secure from the front side by actuating the mauser bolts (31). From the back side assemble the Hopper Lock (32) and the key (33).

4. - Drawer

11. - Hammers Rotor

30. - Feed Hopper

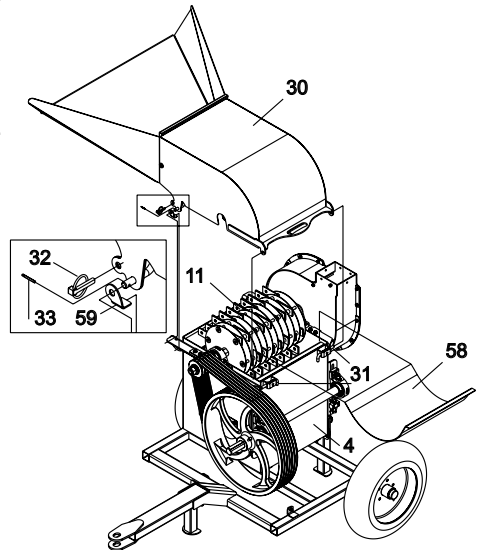
31. - Mauser Bolt

32. - 3/8" Lock Pin

33. - 1/8" x 1" Key

58. - Screen

59. - Hopper Lock



ASSEMBLY

9. - Assemble the Guard (34) with the Guard Cane (35) by mounting them on the Trailer Frame (2). Use the screw (16), the nut (17), the pressure washer (18) and the flat washer (36).

2. - Chassis

16. - 5/16" x 3/4" Hex. Screw

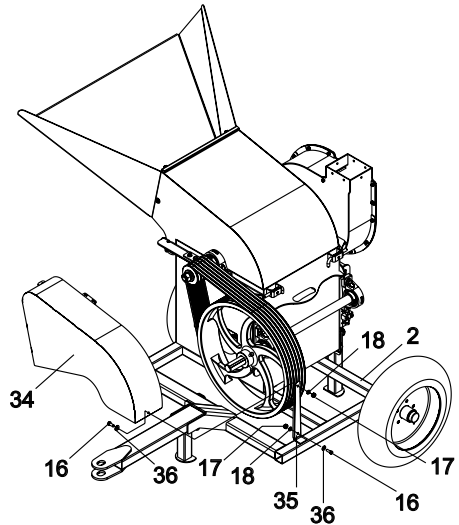
17. - 5/16" Hex. Nut

18. - 5/16" Pressure Washer

34. - Guard

35. - Guard Cane

36. - 5/16" Flat Washer



10.- Assemble the Elbow Connector (37) to the Fan Box (13) and to the Drawer (4), place the Cap packing (38) between the two pieces and the Drawer Packing (39). Secure with the Nut (17) and the washer (18).

4.- Drawer

13.- Fan Box

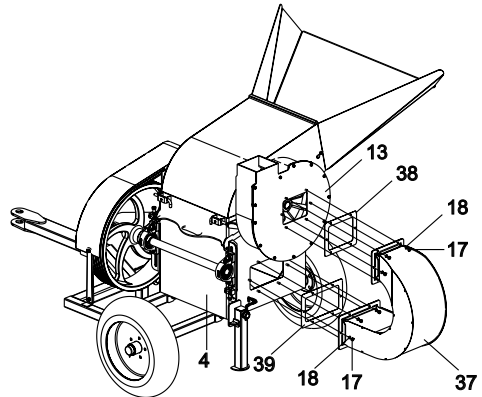
17.- 5/16" Hex. Nut

18.- 5/16" Pressure Washer

37.- Elbow Connector

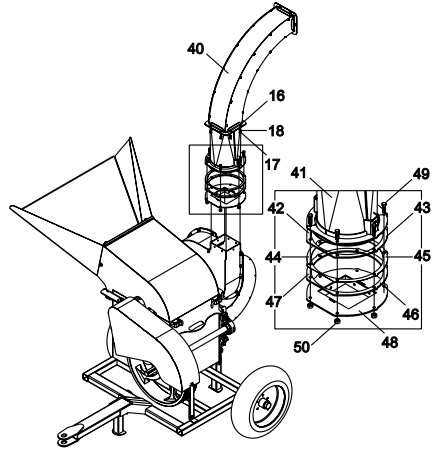
38.- Cap Packing

39.- Drawer Packing



ASSEMBLY

11.- Assemble the Elbow Ejector (40) with the Extension (41) use the screw (16), the nut (17) and the pressure washer (18). Join the Base Extension (41) with the Clamp Ring (42), the Clamp Companion (43), the spacer gage (44), the Gage Companion (45), the spacer Segment (46) and the Spacerr Companion (47) to the Turn Flange (48). Use the screw (49) and the nut (50).

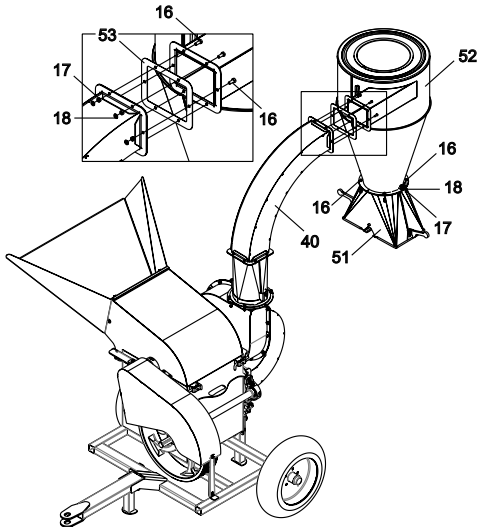


6.- 5/16 x 3/4 Hex.Screw
17.- 5/16 Hex. Nut
18.- 5/16 Pressure Washer
40.- Elbow Ejector
41.- Extension

42.- Clamp Ring
43.- Clamp Companion
44.- Spacer Gage
45.- Gage Companion
46.- Spacer Segment
47.- Spacerr Companion
48.- Turn Flange
49.- 3/8 x 1-1/4 Hex. Screw
50.- 3/8' Nylon Hex. Nut

12.- Assemble the Bagger (51) To the Cyclone (52), use the screw (16), the Nut (17) and the Pressure Washer (18). Join the Cyclone (52) with the Elbow Ejector (40) placing, between those, the Elbow Packing (53). Use the screw (16), the nut (17) and the Pressure Washer (18).

16.- 5/16' x 3/4' Hex. Screw
17.- 5/16' Hex. Nut
18.- 5/16' Pressure Washer
40.- Elbow Ejector
51.- Bagger
52.- Cyclone
53.- Elbow Packing



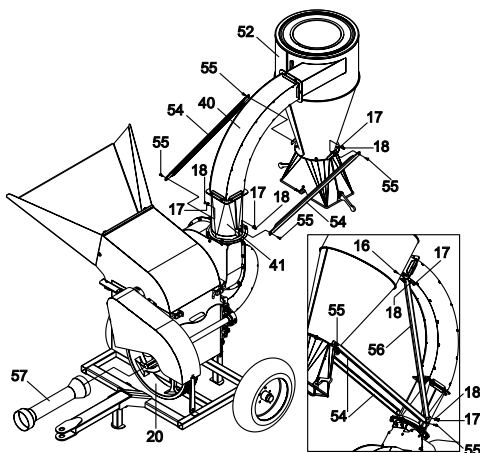
ASSEMBLY

13. - Join the Cyclone (52) and the extension (41) with the Cane Assembly (54). Use the screw (55), the nut (17) and the pressure washer (18). Assemble the third cane (56) to the ejector elbow (40) and to the extension (41) with the screw (16) on the upper side and with the screw (55) on the lower side. Adjust with the nut (17) and the pressure washer (18). Assemble the Arrow Shaft (57) with the pulley (20) and make the proper adjustments (see page 19).

- 16. - 5/16" x 3/4" Hex. Screw
- 17. - 5/16" Hex. Nut
- 18. - 5/16" Pressure Washer
- 20. - 24-3/4 6-R Pulley
- 40. - Ejector Elbow
- 41. - Extension
- 52. - Cyclone
- 54. - Cane Assembly
- 55. - 5/16" x 1" Hex. Screw
- 56. - Third Cane
- 57. - Arrow Shaft

NOTE: The assembly described is the same for the MMRB20 mill and the MMIB20 except for step 1.

IMPORTANT: Read the operation and maintenance sections described in this manual before operating the hammer mill.



PARTS LISTING

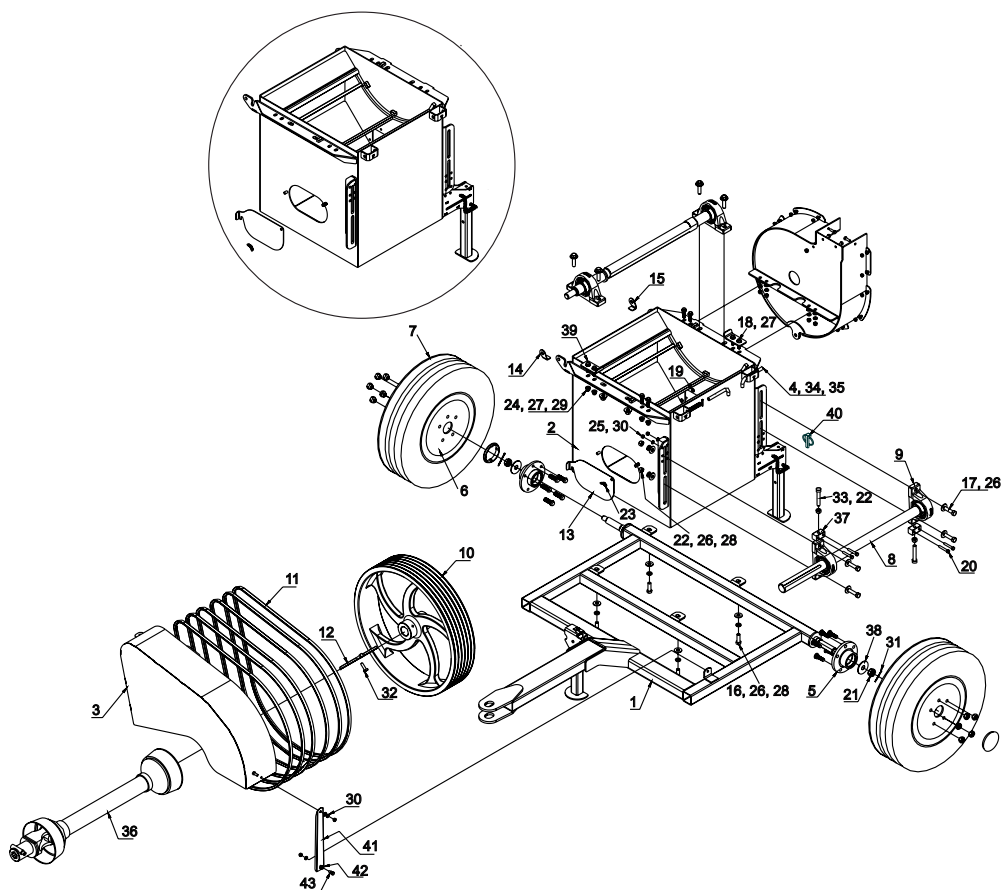
HAMMER MILLS

MMRB20

MMIB20

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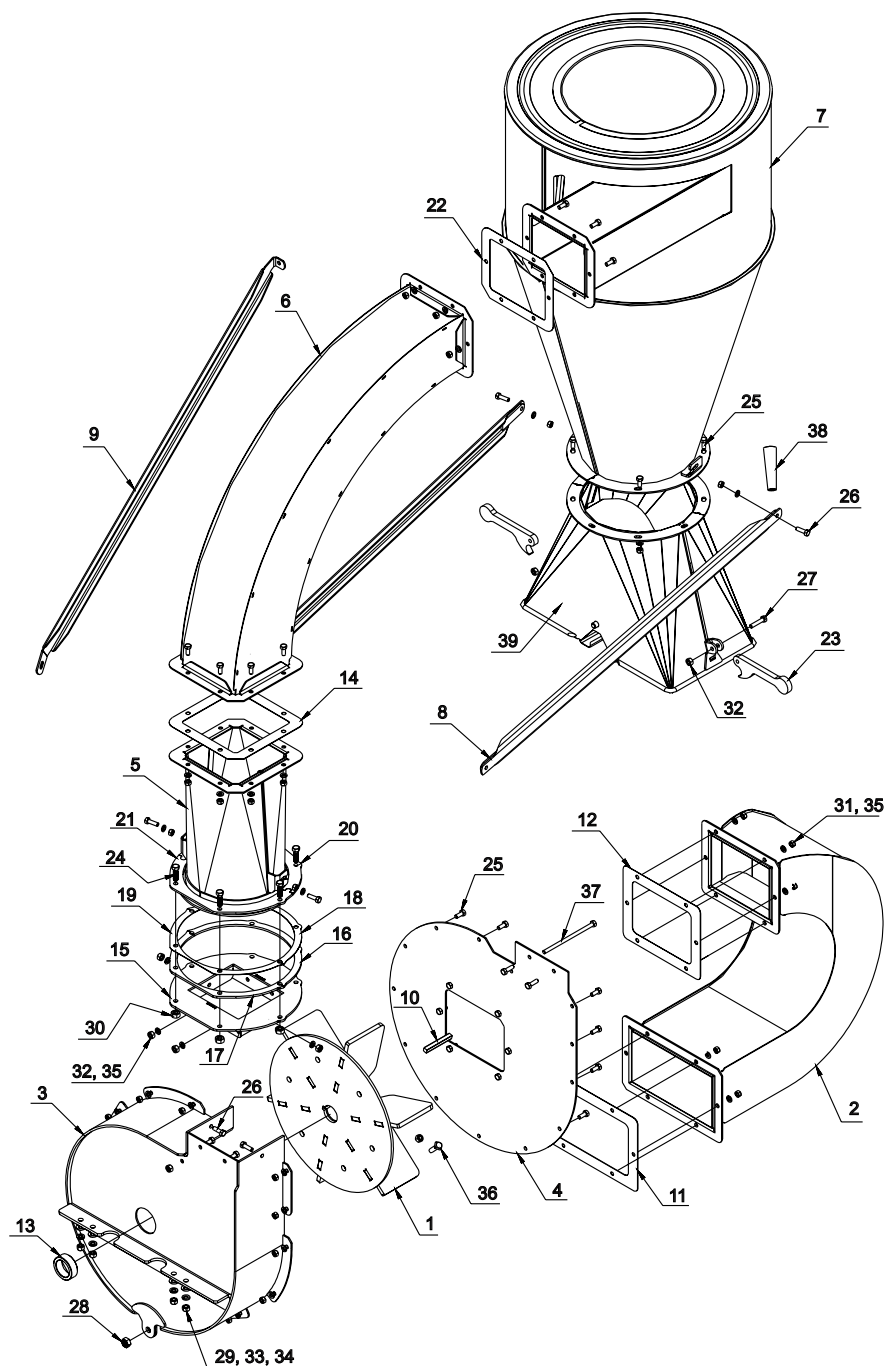
TRAILER PARTS CATALOG (MMRB20 MILL)



TRAILER PARTS LISTING (MMRB20 MILL)

POS.	PART #	DESCRIPTION	QUANTITY
1	MM20030100W	TRAILER FRAME	1
2	MM20030200W	DRAWER	1
3	MM20031200W	GUARD	1
4	MM20031301C	MAUSER BOLT	2
5	4380-1010-06	HAMMER MILL HUB - 2000 LBS (5 IN 5.4)	2
6	4330-2020-00	WHEEL 13 X 4.5 (WITH VALVE)	2
7	4330-1005-00	155/80 R13 WHEEL	2
8	MM20010001C	SIDE ARROW	1
9	4150-2026-00	FLOOR BEARING 1 5/8 TR (UCP-209-26)	2
10	4170-1010-00	Ø 23 3/4» - 6R PULLEY	1
11	4170-2083-01	V BAND B86	6
12	MM20010004C	23 3/4" PULLEY CRADLE	1
13	MM20030065C	DRAWER GATE	1
14	MM20030019C	RIGHT HOPPER LOCK.	1
15	MM20030020C	LEFT HOPPER LOCK.	1
16	4210-5256-01	1/2 X 1 1/2-13 UNC G5 HEX. SCREW	4
17	4210-5260-01	1/2 X 2-13 UNC G5 HEX. SCREW	4
18	4210-5136-01	3/8 X 1 1/4-16 UNC G5 HEX. SCREW	8
19	4210-5074-01	5/16 X 1-18 UNC G5 HEX. SCREW	6
20	4210-5082-01	5/16 X 2-18 UNC G5 HEX. SCREW	4
21	4220-1014-26	3/4-16 UNF CASTLE NUT	2
22	4220-1008-01	1/2-13 UNC NUT	8
23	4220-0010-01	3/8-16 UNC WING NUT	1
24	4220-1004-01	3/8-16 UNC HEX. NUT	4
25	4220-1002-01	5/16-18 UNC G5 HEX. NUT	10
26	4240-1022-01	1/2 FLAT WASHER	8
27	4240-1018-01	3/8 FLAT WASHER	12
28	4250-1024-01	1/2 PRESSURE WASHER	8
29	4250-1020-01	3/8 PRESSURE WASHER	4
30	4250-1018-01	5/16 PRESSURE WASHER	12
31	4260-1056-01	1/8 X 2 KEY	2
32	4210-1574-70	3/8 X 1 1/4-16 UNC GMAQ SQ. OPPRESSOR	2
33	4210-1670-70	1/2 X 3-13 UNC GMAQ SQ. OPPRESSOR	2
34	4360-0070-00	MAUSER SPRING	2
35	4270-4012-00	3/16 X 1 1/4 (HOLLOW) COILED BOLT	2
36	4170-1010-01	1 5/8 X 40 LONG ARROW SHAFT	1
37	MM20030029C	TENSOR BODY	2
38	MM20010030C	MAZE WASHER	2
39	MM20030049C	STOP PLATE	2
40	4270-2040-01	3/8 KEEPER PIN	1
41	MM20030051C	GUARD CANE	1
42	4240-1016-01	5/16 FLAT WASHER	2
43	4210-5072-03	5/16 X 3/4-18 UNC G5 HEX. SCREW	2

CYCLONE PARTS CATALOGUE (MMRB20 AND MMIB20 MILLS)

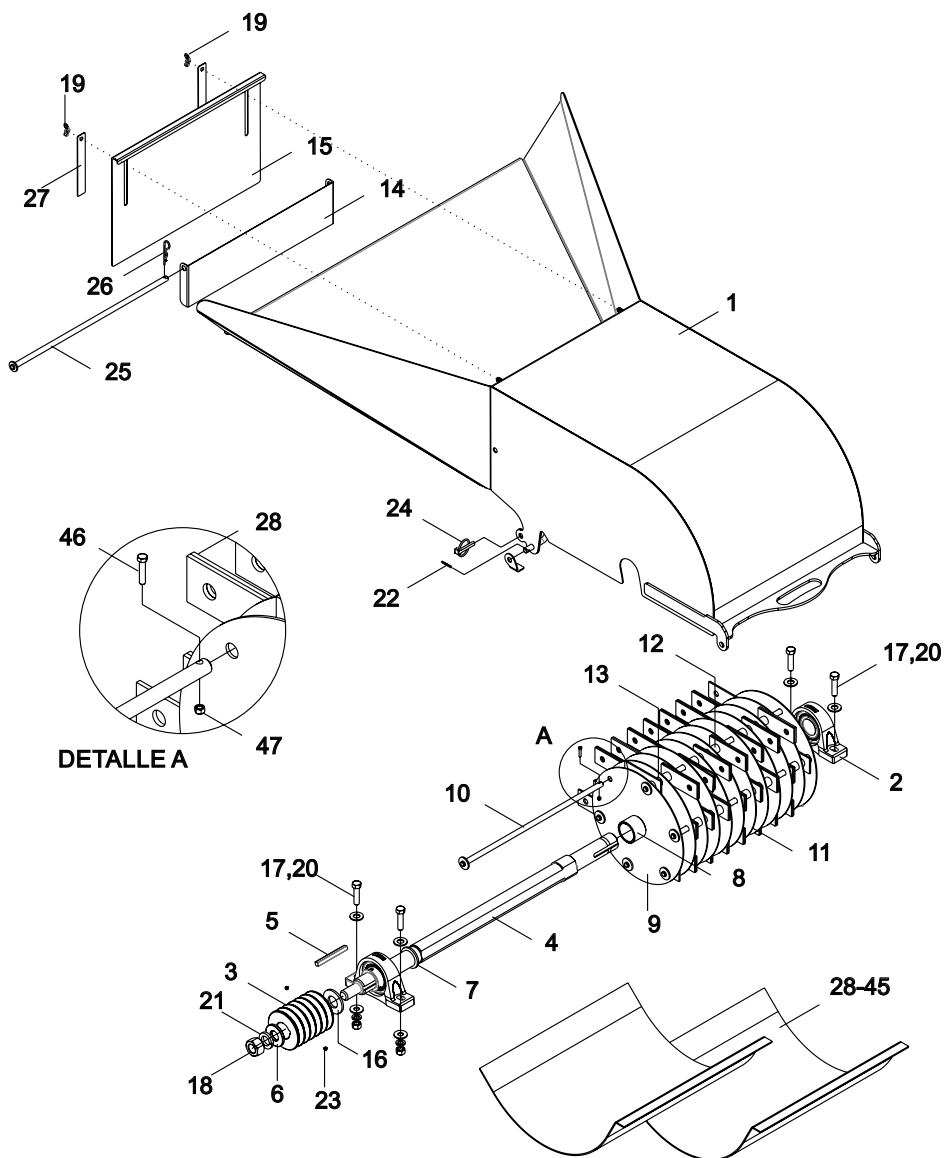


CYCLONE PARTS LISTING (MMRB20 AND MMIB20 MILLS)

POS.	PART #	DESCRIPTION	QUANTITY
1	MM20030400W	FAN	1
2	MM20030500W	ELBOW CONNECTOR	1
3	MM20030600W	FAN BOX	1
4	MM20030700W	CAP	1
5	MM20031500W	EXTENSION	1
6	MM20031300W	ELBOW EJECTOR	1
7	MM20031700W	CYCLONE	1
8	MM20031600W	CANE ASSEMBLY	2
9	MM20030068C	THIRD CANE	1
10	MM20010006C	FAN WEDGE	1
11	MM20010016C	DRAWER PACKING	1
12	MM20010017C	CAP PACKING	1
13	MM20010018C	FAN SPACER	1
14	MM20010067C	EXTENSION PACKING	1
15	MM20031800W	TURNING FLANGE	1
16	MM20030059C	SPACER SEGMENT	1
17	MM20030061C	SPACER COMPANION	1
18	MM20030066C	SPACER GAGE	1
19	MM20030072C	GAGE COMPANION	1
20	MM20030071C	CLAMP RING	1
21	MM20030070C	CLAMP COMPANION	1
22	MM20010026C	ELBOW PACKING	1
23	MM20030027C	HANDLE	2
24	4210-5136-01	3/8 X 1 1/4-16 UNC G5 HEX. SCREW	10
25	4210-5072-03	5/16 X 3/4-18 UNC G5 HEX. SCREW	24
26	4210-5074-01	5/16 X 1-18 UNC G5 HEX. SCREW	8
27	4210-5078-01	5/16 X 1 1/2-18 UNC G5 HEX. SCREW	2
28	4220-1008-01	1/2-13 UNC NUT	2
29	4220-1004-01	3/8-16 UNC HEX. NUT	6
30	4220-1004-51	3/8-16 UNC INC NYLON NUT	6
31	4220-1002-01	5/16-18 UNC G5 HEX. NUT	46
32	4220-1002-51	5/16-18 UNC INC NYLON NUT	9
33	4240-1018-01	3/8 FLAT WASHER	4
34	4250-1020-01	3/8 PRESSURE WASHER	8
35	4250-1018-01	5/16 PRESSURE WASHER	46
36	4210-1574-70	3/8 X 1 1/4-16 UNC GMAQ SQ. OPPRESOR	2
37	4210-1114-01	5/16 X 6-18 UNC G5 HEX. SCREW	1
38	4180-1100-10	AG-500-5 HANDLE	1

ROTOR PARTS CATALOGUE

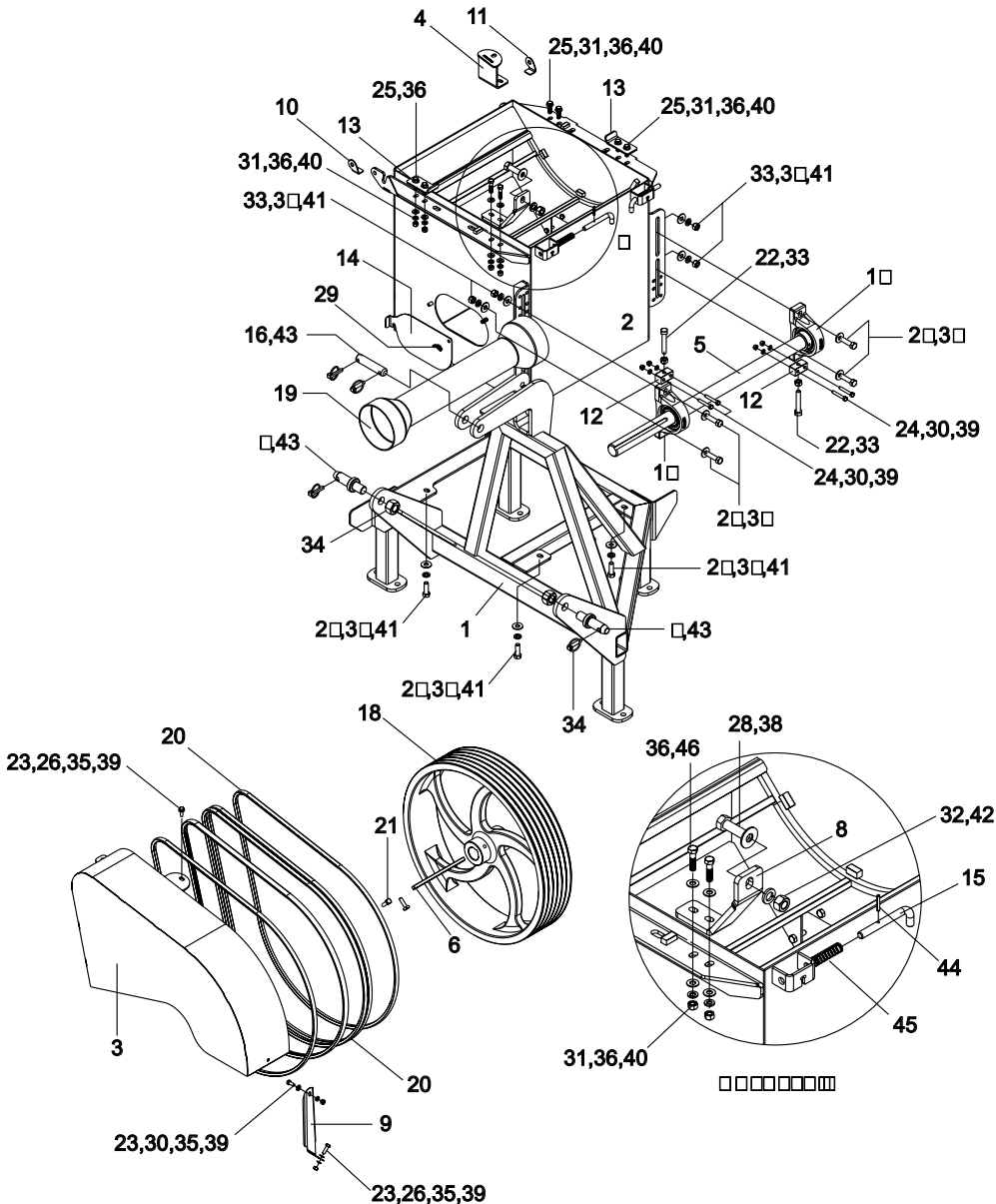
(MMRB20 AND MMIB20 MILLS)



ROTOR PARTS LISTING (MMRB20 AND MMIB20 MILLS)

POS.	PART #	DESCRIPTION	QUANTITY
1	MM20010300W	FEED HOPPER	1
2	4150-2026-00	1 5/8 FLOOR BEARINGS	2
3	4170-1012-00	Ø 4» - 6R PULLEY	1
4	MM20010003C	CENTRAL SHAFT	1
5	MM20010005C	4" PULLEY WEDGE	1
6	MM20010007C	1" FLAT WASHER	1
7	MM20010008C	1-5/8" FLAT WASHER	1
8	MM20010009C	1-1/2" L SPACER TUBE	12
9	MM20010010C	ROTOR PLATE	12
10	MM20032000W	HAMMER TRAY ROD	6
11	MM20010012C	1 3/32" SPACER TUBR	30
12	MM20010013C	9/16" SPACER TUBE	24
13	MM20010052C	5/8" SPACER TUBE	12
14	MM20030063C	FOLDING GATE	1
15	MM20030064C	ADJUSTABLE GATE	1
16	MM20010028C	1/2" SPACER	1
17	4210-5260-01	1/2 X 2-13 UNC G5 HEX. SCREW	4
18	4220-1018-01	1-8 UNC NUT	1
19	4220-0010-01	3/8-16 UNC WING NUT	2
20	4240-1022-01	1/2 FLAT WASHER	4
21	4250-1040-01	1" PRESSURE WASHER	1
22	4260-1048-01	1/8 X 1 KEY	2
23	4210-1566-80	3/8 X 3/8-16 UNC ALLEN OPPRESOR	2
24	4270-2040-01	3/8 KLIK LOCK	1
25	MM20012300W	PIVOT ROD ASSEMBLY	1
26	4270-1004-01	1/8" KEEPER PIN	7
27	MM20010058C	SLOT COVER	2
28	MM20010031C	1/16" (1.5 mm) SCREEN	1
29	MM20010032C	3/32" (2.4 mm) SCREEN	1
30	MM20010033C	1/8" (3.2 mm) SCREEN	1
31	MM20010034C	5/32" (4 mm) SCREEN	1
32	MM20010035C	3/16" (4.7 mm) SCREEN	1
33	4016-1100-10	1/4" (6 mm) SCREEN	1
34	4016-1120-10	5/16" (8 mm) SCREEN	1
35	4016-1140-10	3/8" (9.5 mm) SCREEN	1
36	MM20010039C	7/16" (10 mm) SCREEN	1
37	4016-1178-10	1/2" (12 mm) SCREEN	1
38	4016-1180-10	5/8" (16 mm) SCREEN	1
39	4016-1200-10	3/4" (19.1 mm) SCREEN	1
40	MM20010043C	7/8" (22 mm) SCREEN	1
41	4016-1242-10	1" (25.4 mm) SCREEN	1
42	MM20010045C	1 1/8" (28 mm) SCREEN	1
43	MM20010046C	1 1/4" (30 mm) SCREEN	1
44	MM20010047C	1 3/8" (35 mm) SCREEN	1
45	MM20010048C	1 1/2" (40 mm) SCREEN	1
46	4210-5014-01	1/4 X 1" - 20 UNC G5 HEX. SCREW	6
47	4220-1000-51	1/4 - 20 UNC INC. NYLON NUT	6

CHASSIS PARTS CATALOGUE
(MMIB20 MILL)






CHASSIS PARTS LISTING (MMIB20 MILL)

POS.	PART #	DESCRIPTION	QUANTITY
1	MM20020100W	CHASSIS	1
2	MM20020200W	DRAWER	1
3	MM20020300W	MMIB-20 GUARD	1
4	MM20020400W	GUARD COMPANION	1
5	MM20010001C	SIDE ARROW	1
6	MM20010004C	23 3/4" PULLEY WEDGE	1
7	MM20020001C	HITCH PIN	2
8	MM20020002C	RIGHT PSE BRACING	1
9	MM20020003C	GUARD ROD	1
10	MM20030019C	RIGHT HOPPER LOCK	1
11	MM20030020C	LEFT HOPPER LOCK	1
12	MM20030029C	TENSOR BODY	2
13	MM20030049C	STOP PLATE	2
14	MM20030065C	BRAWER GATE	1
15	MM20031301C	MAUSER BOLT	2
16	RA01110002C	UPPER HITCH PIN	1
17	4150-2026-00	1 5/8 TR (CUCP-206-29) FLOOR BEARING	2
18	4170-1010-00	23 3/4" PULLEY, 6 SLOTS	1
19	4170-1012-01	1 58" X 26" ARROW SHAFT	1
20	4170-2083-01	V BAND B83	6
21	4210-1574-70	3/8 X 1 1/4-16 UNC SQ. HEAD OPPRESSOR	2
22	4210-1670-70	1/2 X 3 - 13 UNC SQ. HEAD OPPRESSOR	2
23	4210-5072-03	5/16 X 3/4 - 18 UNC HEX. SCREW	1
24	4210-5082-01	5/16 X 2 - 18 UNC G5 HEW. SCREW	4
25	4210-5136-01	3/8 X 1 1/4 - 16 UNC G5 HEX. SCREW	6
26	4210-5074-01	5/16 X 1 - 18 UNC G5 HEX. SCREW	2
27	4210-5260-01	1/2 X 2 - 13 UNC G5 HEX. SCREW	8
28	4210-5376-01	5/8 X 2 - 11 UNC G5 HEX. SCREW	1
29	4220-0010-01	3/8 - 16 UNC WING NUT	1
30	4220-1002-01	5/16 - 18 UNC HEX. NUT	7
31	4220-1004-01	3/8 - 16 UNC HEX. NUT	8
32	4220-1012-01	5/8 - 11 UNC HEX. NUT	1
33	4220-1008-01	1/2 - 13 UNC NUT	6
34	4220-1018-01	1 - 8 UNC NUT	2
35	4240-1016-01	5/16 FLAT WASHER	2
36	4240-1018-01	3/8 FLAT WASHER	16
37	4240-1022-01	1/2 FLAT WASHER	8
38	4240-1026-01	5/8 FLAT WASHER	1
39	4250-1018-01	5/16 PRESSURE WASHER	7
40	4250-1020-01	3/8 PRESSURE WASHER	8
41	4250-1024-01	1/2 PRESSURE WASHER	12
42	4250-1028-01	5/8 PRESSURE WASHER	1
43	4270-2040-01	3/8 KEEPER PIN	4
44	4270-4012-00	3/16 X 1 1/4 (HOLLOW) COILED BOLT	2
45	4360-0070-00	2.25 CLAMPING SPRING	2
46	4210-5136-01	3/8 X 1 1/4 - 16 UNC G5 HEX. SCREW	2

TORQUE CREW SPECIFICATIONS

NON-METRIC BOLTS TIGHTENING SETTINGS (IN.)

Tamaño del perno	Grado 2		Grado 5		Grado 8	
	N·m	LB·FT	N·m	LB·FT	N·m	LB·FT
5/16-18	15	11	24	17	33	25
3/8-16	27	20	42	31	59	44
7/16-14	43	32	67	49	95	70
1/2-13	66	49	105	76	145	105
9/16-12	95	70	150	110	210	155
5/8-11	130	97	205	150	285	210
3/4-10	235	170	360	265	510	375
7/8-9	225	165	585	430	820	605
1-8	340	250	875	645	1230	910
Identificación de pernos estándar  Grado 2 Sin marcas  Grado 5 3 Marcas  Grado 8 6 Marcas						

GENERAL INFORMATION

Screw's Torque Values

All the bolts use don this machine are Grade “5”, unless a higher grade is specified. Always replace bolts with others of the same grade. Metric screws have the class number marked on the head.

Tighten the screws according to the above table, unless the Operator's Manual indicates something different. Do not over tighten the screws, since this may cause failure during operation.

NOTE: DO NOT use these values if a different torque value, for an exact application, is specified. The given values are for general usage. Check periodically the tightening of the screws.

TORQUE CREW SPECIFICATIONS

METRIC BOLTS TIGHTENING SETTINGS

Tamaño de pernos	Clase 5.8		Clase 8.8		Clase 10.9	
	N·m	LB·FT	N·m	LB·FT	N·m	LB·FT
M 5 x 0.8	4	3	6	5	9	7
M 6 x 1	7	5	11	8	15	11
M 8 x 1.25	17	12	26	19	36	27
M 10 x 1.5	33	24	52	39	72	53
M 12 x 1.75	58	42	91	67	125	93
M 14 x 2	92	68	145	105	200	150
M 16 x 2	145	105	225	165	315	230
M 18 x 2.5	195	145	310	230	405	300
M 20 x 2.5	280	205	440	325	610	450
M 24 X 3	480	355	760	560	1050	780
Identifique los pernos métricos por el número de la clase sellado en la cabeza o en la tuerca. Los números más altos indican mayor fuerza.						

GENERAL INFORMATION

Screw's Torque Values

Always replace bolts with others of the same grade. Metric screws have the class number marked on the head.

Tighten the screws according to the above table, unless the Operator's Manual indicates something different. Do not over tighten the screws, since this may cause failure during operation.

NOTE: DO NOT use these values if a different torque value, for an exact application, is specified. The given values are for general usage. Check periodically the tightening of the screws.

THEFT PREVENTION

RECORD PRODUCT IDENTIFICATION NUMBER (P.I.N.)

Serial Number Plate for your grader blade is located on the trailer axis.

Record the serial number in the space corresponding box on the safeguards section.
Mark the machine with your own numeration system.

Write down the Product Identification Number (PIN) of the machine and main components. Include numbers (PIN) in all insurance documents, financing and warranty.

Your dealer will need this information for a quick and efficient service when you order parts.

IMPORTANT: Each time you need to order spare parts for your Grader blade, it is important to provide the 10 characters Serial Number. It is imperative comply this requirement.



TECNOMEC AGRICOLA, S.A. DE C.V.
Carr. a Paso Blanco Km. 2 # 400
Col. Vista Hermosa C.P. 20900
Jesús Ma. Aguascalientes, MEX
Tel. (52) (449) 922 47 66 / 92 BISON
Fax (52) (449) 922 47 67

No. SERIE

MODELO

WARRANTY

Please enter information below and save for future reference.

AUTHORIZED DEALERSHIP: _____	SALESMAN _____
MACHINE MODEL: _____	SERIAL NUMBER: _____
END CUSTOMER NAME: _____	PURCHASE DATE: / /
ADDRESS: _____	PHONE NUMBER: () _____
	EMAIL: _____

A. GENERAL PROVISIONS - The warranties described below are provided by Tecnomec Agrícola, S.A. de C.V. (TECNOMECE) to the original purchasers of new agricultural products from **TECNOMECE** or **authorized dealers for a period of one (1) year under agricultural use**. Replacement or repair parts installed in the equipment covered by this limited warranty are warranted for ninety (90) days from the date of purchase of such part or the expiration of the applicable new equipment warranty period, whichever occurs later. Under these warranties, TECNOMECE will repair or replace, at its discretion, any covered part which is found to be defective in material or workmanship during the applicable warranty term. Warranty service must be performed by an authorized BISON dealer, which will use only new or remanufactured parts or components furnished by TECNOMECE.

Warranty service will be performed without charge to the purchaser for parts or labor. The purchaser will be responsible, however, for any service call and/or transportation of product to and from the dealer's or service center's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service and/or maintenance not directly related to any defect covered under the warranties below. At TECNOMECE's request, dealer will be responsible for returning the parts to TECNOMECE for evaluation.

B. WHAT IS WARRANTED? - All parts of any new TECNOMECE product. TECNOMECE makes no warranty, express or implied, with respect to engines, batteries, tires or other parts or accessories not manufactured by TECNOMECE. Warranties for these items, if any, are provided separately by their respective manufacturers.

Each warranty term begins on the date of product delivery to the purchaser.

C. WHAT IS NOT WARRANTED TECNOMECE IS NOT RESPONSIBLE FOR THE FOLLOWING? - (1) Used Products; (2) Any product that has been altered, modified, or used in connection with attachments in ways not approved by TECNOMECE; (3) Depreciation or damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow the product's OPERATOR MANUAL instructions, misuse, lack of proper protection during storage, or accident; (4) Normal maintenance parts and service, including, but not limited to, oil filters, coolants and conditioners, cutting parts, belts, brake and clutch linings.

Incidental or consequential losses, damages or expenses, arising directly or indirectly from the product, whether such claim is based upon breach of contract, breach of warranty, negligence, strict liability in tort or any other legal theory. Without limiting the generality of the foregoing, TECNOMECE specifically disclaims responsibility for any damages relating to (i) lost profits, business, revenues or goodwill; (ii) loss of crops; (iii) loss because of delay in harvesting; (iv) any expense or loss incurred for labor, supplies, substitute machinery or rental; or (v) any other type of damage to property or economic loss.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

D. SECURING WARRANTY SERVICE - To secure warranty services, the purchaser must (1) report the product defect to an authorized dealer and request repair within the applicable warranty term, (2) present evidence of the warranty start date, and (3) make the product available to the dealer or service center within 45 days.

E. NO IMPLIED WARRANTY OR OTHER REMEDY - AGRICULTURAL PRODUCTS - Where permitted by law, neither TECNOMECE nor any company affiliated with it makes any warranties, representations, or promises, express or implied as to the quality or performance, or freedom from defect of its agricultural products other than those set forth above, and **NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE. IN NO EVENT WILL THE DEALER, TECNOMECE OR ANY COMPANY AFFILIATED WITH TECNOMECE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

The only remedies the purchaser has in connection with the breach of performance of any warranty on TECNOMECE agricultural products are those set forth above.

F. NO WARRANTY MODIFICATION - No agent, representative, authorized dealer, distributor, service center, serviceperson, salesperson, other than an officer from TECNOMECE is authorized to alter, modify, or enlarge this Warranty.

G. If further information is needed; contact your selling dealer or the nearest branch office of TECNOMECE

H. This Warranty is effective only if the warranty registration is electronically submitted to TECNOMECE by dealer within ten (10) days of retail purchase date.

For warranty services contact your BISON selling dealer.

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