GRAIN MILL

MILL MANUAL

MILL91AS-MB | MILL95AS-MB

IMPORTANT SAFETY INFORMATION

Please read this entire instruction manual for important safety information prior to the use of your mill.

⚠WARNING Failure to follow these warnings could result in serious injury or death.

Safety Precautions:

- *Follow all safety alert symbols, warnings, safety precautions, and safety signs, otherwise, injury or machine failure may occur.*
- *Operating personnel must be trained before operating.*
- *Before using the mill, the operator must read and understand all instructions, master the content, and strictly abide by all safety regulations.*
- *All safety labels must be kept clean. If labels are damaged or lost, they must be ordered and re-labeled before use.*
- *DO NOT make alterations to the mill as it can cause performance degradation, damage, and become a danger to safely operate.*

General Precautions:

⚠DANGER Please adhere to the following points when adjusting and operating the machine before running the machine, confirm the motor is grounded safely. Ensure all the parts and adjustments are fastened securely.

- *If you hear any unusual sounds during operation, shut down the machine and check it immediately.*
- *During installation and operation, follow all the safety regulations of the state and local authorities.*
- *Clean the inside of the machine with a brush or similar product. DO NOT put your hand into the space between the mill rollers. Injury or death will occur.*

⚠DANGER Please adhere to the following points during the milling process.

- *Do not operate the mill with the belt cover removed.*
- *Do not operate the mill with the transmission cover removed.*

Understanding Safety Signs & Symbols:

Three sign words represent the degree of risk: Danger, Warning, and Attention.

Danger: Means if not avoided, will lead to death or serious injury.

Warning: Means potential danger, if not avoided, will lead to death or serious injury.

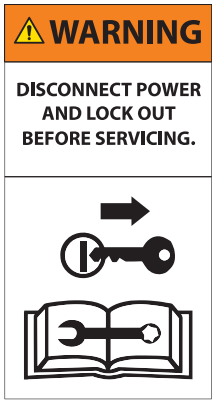
Attention: Means potential danger.

Safety Signs and Post Placement:

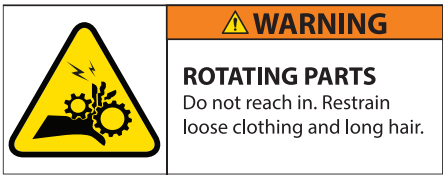
⚠WARNING

- *The information conferred by a safety sign refers to personal safety, which the operator must execute strictly.*
- *Safety signs must be kept visible, if lost please have them replaced promptly.*
- *When changing new parts within the maintenance period, the safety sign should be changed. Different machine types require a little difference in the position and content of the safety sign. Please take the material object as the standard.*

Label 1:



Label 2:



Label 3:

Label 1: Disconnect Power and Lock Out Before Servicing
When maintaining the equipment ensure the power is off. Read manual before servicing.

Label 2: ROTATING PARTS. Do not reach in. Restrain loose clothing and long hair.
Entanglement Hazard. Do not operate mill with loos closing, long exposed hair or jewelry.

Label 3: ROTATING PARTS. Do not reach in. Restrain loose clothing and long hair.
Crush hazard, keep hands clear during operation.

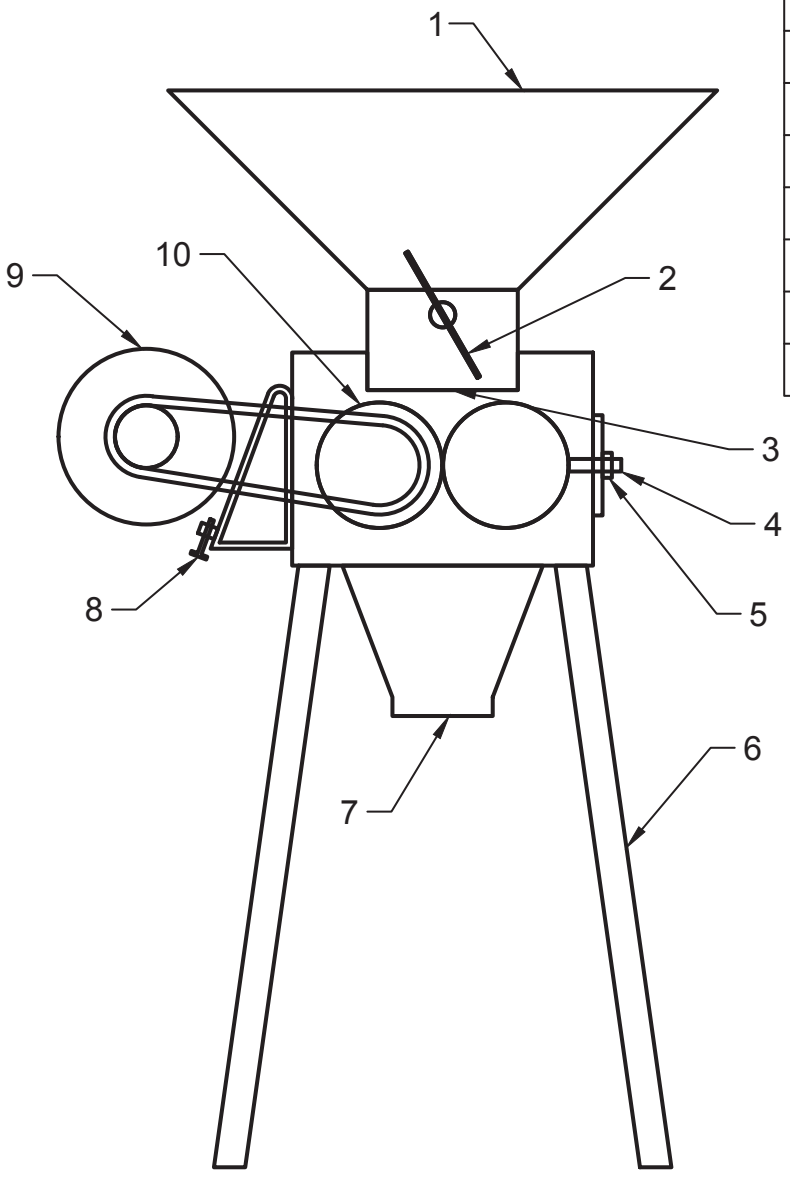
OVERVIEW OF THE MILL

The raw unprocessed grains enter into the feed hopper. The mill uses slotted rollers to crush the grain into a variety of textured flours. When finished, the product is discharged by the discharge hopper underneath the machine.

Structure:

The malt mill is mainly composed of:

1. Feed Hopper
2. Flow Gap Adjustment Mechanism
3. Crushing Chamber
4. Roller Gap Adjustment Hand-wheels
5. Adjustment Lock-nuts
6. Frame
7. Discharge Hopper
8. Belt Tension Adjustment Screw
9. Motor
10. Rollers



1	Feed Hopper
2	Flow Rate Adjustment
3	Milling Chamber
4	Gap Adjustments
5	Adjustment Lock nuts
6	Frame
7	Discharge Chute
8	Belt Tension Adjuster
9	Motor
10	Rollers

MAIN TECHNICAL FEATURES

MILL SPECIFICATIONS:

TABLE 1

Model:	MILL91AS-MB	MILL95AS-MB
Outer Size L x W x H (m):	700 x 620 x 1200	800 x 800 x 1600
Weight:	375 lbs.	575 lbs.
Power (kW):	1.1	.3
Fast Roller Spindle Speed (RPM):	700	700

Please Note: The power should be configured appropriately. Do not increase the speed of the rollers.

INSTALLATION

The seals inside the heat exchanger are removable. Seals should be replaced if there are any signs of cracking. If the heat exchanger does not seal before the plate's contact, the seals must be replaced otherwise, the plates may be damaged during the tightening sequence.

MOVING YOUR MILL

⚠ WARNING

- *Do not allow the mill to fall over while lifting. Damage to the machine or injury can occur.*
- *Ensure you lift the mill securely and only from the bottom.*
- *Do not allow people under the mill while lifting. Injury or death can occur.*

ELECTRICAL INSTALLATION

⚠ ATTENTION

- *Have a qualified electrician install the controls for your mill.*
- *Provide a safety shut-off near the mill that the operator can reach.*
- *Provide a safety disconnect for servicing.*
- *Follow all local codes and regulations.*

⚠ WARNING

- *Have a qualified electrician familiar with local codes wire your mill.*
- *Wire a service disconnect ahead of any needed controls and your mill.*
- *A safety stop switch must be located within reach of the operating position.*

Your mill is supplied with a three-phase motor rated for 208-240V. The electrician will determine if Delta or Wye wiring is suitable for your installation. See diagrams for configuring the motor for each. The electrician will determine the wire size based on your installation. After installation, inspect the mill for proper rotation. A mill rotating backwards will not pull grain into the gap.

TIP: If your motor spins backward, reverse U1 and V1. See the diagram.

CHART1

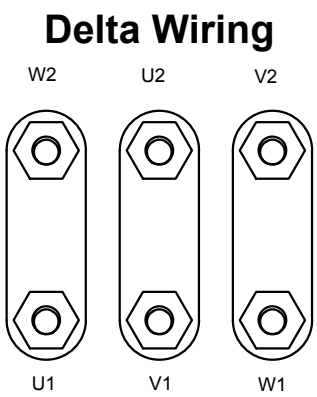
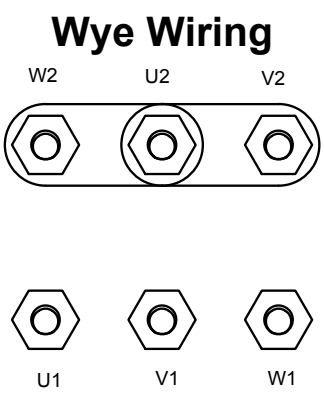


CHART2



OPERATION

⚠WARNING

- *Follow all safety alert symbols, warnings, safety precautions, and safety signs, otherwise, injury or machine failure may occur.*
- *Operating personnel must be trained before operating.*
- *Before using the mill, the operator must read and understand all instructions, master the content, and strictly abide by all safety regulations.*
- *All safety labels must be kept clean. If labels are damaged or lost, they must be ordered and re-labeled before use.*
- *DO NOT make alterations to the mill as it can cause performance degradation, damage, and become a danger to safely operate.*

1. Close the gap of the feed hopper to ensure the raw material can't fall into the mill gap.
2. Start the motor.
3. Put the raw material into the feed hopper.
   a. Ensure there are not any iron nails, metal blocks, or hard rocks in the raw materials. It is important that the raw materials are clean before placing them into the machine.
4. Adjust the knob of the adjusting plate slowly, and check whether the crush meets your requirements.
   a. You can secure the hand wheel by using lock nuts to keep the crush at the desired level.
5. When finished, run the machine so that it idles for 1 to 2 min. The machine should not be stopped until the material that remains inside the machine is fully discharged.
6. Clear away any leftover residue inside the machine,
7. Keep the body of the machine and the area around it clear and free from dust.
8. In order to protect the rollers from quick wear, adjust the gap wider after the milling has finished

OPERATOR SAFETY

⚠WARNING

- *Follow all safety alert symbols, warnings, safety precautions, and safety signs, otherwise, injury or machine failure may occur.*
- *Operating personnel must be trained before operating.*
- *Before using the mill, the operator must read and understand all instructions, master the content, and strictly abide by all safety regulations.*
- *All safety labels must be kept clean, if the labels is damaged or lost, it must be ordered and re-labeled before use.*
- *DO NOT make alterations to the mill as it can cause performance degradation, damage, and become a danger to safely operate.*

In order to prevent accidents, please observe the following safety rules:

1. Before using this product, Operators must carefully read the manual and be trained in its safety procedures.
2. Operators should inspect the unit and the operating area to ensure safety before starting the mill.
3. When operating the mill, strictly abide by the manual in order to prevent accidents.
4. Do not use this machine if you are pregnant or under the age of 18.
5. Before operating the machine, check that the key parts of the connections are secure and that all controls are set to the stop position. This will help prevent an unexpected accident on start-up.
6. Do not start the machine when the protective covers are not installed.
7. If an abnormal issue occurs, immediately stop to inspect the machine. Once the issue has been determined, disconnect the power and fix the problem.
8. When the feed mouth is jammed, do not use your hands or other objects to help the feed. This will result in injury or death.
   a. If the mill is jammed, close the flow gate.
   b. Open the gap till all the grain falls through.
   c. Reset the gap.
   d. Restart milling.

13. The machine can be cleaned with tools like a brush. Ensure no iron, stones, or other debris enters the gap while cleaning.
14. Do not remove the belt pulley or cover on the side of the housing while the mill is in operation. This will result in injury or death.

GARMENT SAFETY

⚠ WARNING

- *Restrain long hair including facial hair while operating the machine.*
- *While operating the machine, do not wear oversized or open clothing. Clothing can be caught in the machine and cause serious injury.*
- *Do Not wear a headscarf, scarves, or neckties while operating the machine.*
- *Do Not wear open-toed shoes.*

PRE-OPERATION INSPECTION

INSPECTION BEFORE RUNNING MACHINE

⚠ ATTENTION

1. Before starting the machine, ensure there is no other personnel near the machine. Please give a signal before starting.
2. Do not run the mill when the protective cover is improperly attached. The protective cover is not allowed to be opened or removed while running the machine. The protective cover should be repaired and replaced before operation if it is damaged.
3. Check and replace worn-out or broken parts before operating.
4. Any lubricant contamination needs to be cleaned before use.
5. Check the tightness of the drive belt and the reliability of the protective cover, and check whether there are any loose fasteners. Ensure the parts are well lubricated.
6. Check the gap of mill rolls is consistent from end to end.

INSPECTION OF NO-LOAD ROTATION

A. Run the motor to ensure the direction of the belt pulley is correct.

B. Check if the rotation speed meets the requirement listed in the chart above.

C. Ensure there are no knocking sounds or any unusual conditions when inspecting.

D. Ensure the bearing and other parts are under the normal running status.

E. Please complete a no-loading check that should be done within 30 minutes before running the machine.

ADJUSTMENT OF FLOW

Because different products are different sizes and need different levels of crush, the gap of the feeding hopper can be adjusted to ensure uniform feeding at any time. The method of adjusting the flow is to revolve the knobs on the regulating mechanism. The width of the feed opening will change when you revolve the knobs, and the inflow volume of raw material is likely to change. The gate in the hopper is opened and closed to adjust the flow rate as desired for the process.

ADJUSTMENT TROUBLESHOOTING

A. The left and the right-hand wheel should be adjusted equally in order to keep the rollers parallel. Ensure the wheels are turned the same number of times or the gap on both sides of the mill roller will not be uniform.

B. You can fasten the locknut to enter the normal working state when the crush meets your requirements. Record the data for quick adjustments.

GENERAL MAINTENANCE

In order to keep the mill in a serviceable condition and extend the service life, please regularly make adjustments to the belt and maintain the mill. Please be familiar with the concepts and the procedure to adjust and maintain the complete machine and its parts.

SAFETY INSPECTION AND REPAIR

⚠ ATTENTION

1. When this machine needs to be repaired by arc welding, it should be stopped and the power should be cut off.
2. This machine should only be repaired by qualified personnel.
3. Please do not adjust, repair, or lubricate while the machine is running.
4. Feet, hands, and clothes should be kept at a distance from driven parts.
5. Do not replace wiring in the electrical system. The wiring must be well connected and the fuse capacity should meet the requirements of local code.

6. If maintenance is needed, ensure the mill is disconnected from power.
7. Stop the machine before removing the pulley cover. If absolutely necessary, you may run the motor briefly. Then stop the machine and reinstall the cover before actual use.

MAINTENANCE, REPLACEMENT, AND REMOVAL OF THE MILL ROLLERS

The correct installation, maintenance, and diagnosis of the mill rollers will increase the performance and service life of the mill. After using the mill for a period of time, you will need to maintain and adjust the mill according to the following methods.

1. Removal of the mill rollers
   - **a.** Remove protective cover, V-belt, and V-pulley.
   - **b.** Remove the small and big wheel gears.
   - **c.** Remove the adjusting mechanism.
   - **d.** Open the bearing block and remove the mill rollers
2. Installation of the mill rollers is the reverse of removal before Reassembly, you should clean the surface of the parts, lubricate the bearing, check the V-Belt for damage, and ensure the roller rotates smoothly. Check whether there is dust and/or impurities on the mill roller bearing block. If not it will affect the grinding efficiency of the mill.

Maintenance of the Mill Rollers

A. To maintain the longevity of the mill, ensure the raw material is clean and free of debris.

B. Do not bump and damage the journal when you carry, install or disassemble the mill roller.

C. To protect the mill rollers, do not roll them on the ground or slab. Doing so can damage the roller grooves.

Cleaning the Mill Roller

Keeping the mill rollers clean is very important. Please keep the surface of the mill rollers clean when you mill raw materials. A mill brush (or stiff nylon brush with a long handle) is the most common tool to clean the mill roller. When cleaning, keep enough pressure on the brush to ensure the mill roller is cleaned from any debris.

⚠ ATTENTION

A. Do not force the adjusters closed. The closing force should be light and even so as to not damage the adjusters and rollers.

B. Do not allow nails, metal, or hard rock mixed with abrasives to enter the mill. If it does, the mill will be damaged.

C. Do not let the mill idle unattended. Letting the mill idle unattended can allow the adjusters to close the gap. This will air grind the rollers and damage the mill. To avoid air grinding the rollers, the hopper should be ready with a small amount of material (for example, grain) and the gate opened.

D. This machine mainly is designed to crush malted material. When grinding corn, a coarser grinding roller is required. It can also be used to remove the germ and then crush it into a fine powder as a processing method.

E. This machine is not designed to process soybean and high oil content material.

LUBRICATION OF THE MILL

1. The lubrication of the rolling bearing block, (please see Table 3)

NOTE: Unpack and wash regularly and apply enough lubricating grease.

2. Regularly lubricate all frictional parts with food-grade machine oil such as CRC Machine Oil: Mineral.

TABLE 3

Model	Bearing Part	Bearing	Quantity
MILL91AS-MB	Roller Bearing	1208	4
MILL95AS-MB	Roller Bearing	1208	4

PERIODIC INSPECTION AND ADJUSTMENT

1. The pulley, belt, and adjustment mechanism should be checked often, and repaired in a timely manner if you find any problems.
2. The protective cover and the fixed bolt of the bearing adjustment block should be checked often, you should tighten them if loose.
3. The electrical system should be checked often to avoid short circuits.
4. The performance of the machine should be checked often,

5. This machine should be repaired in a timely manner when a failure occurs, running with problems can cause permanent damage to the mill or injury.

The Adjustment of The Baffle (Please Refer To Table 1)

A Wooden or Nylon Baffle is installed on the inner wall of the crushing cavity on both sides of the mill rollers. This helps to prevent the raw material from leaking past both ends of the rollers.

When the diameter of the mill rollers becomes too small from wear, loosen the clamp nut of the wallboard, and move it down. Re-fasten the clamp nut when there is no raw material left on both ends of the rollers.

GAP ADJUSTMENT

Barely differs in size, requiring different levels of crush based on the size of the barely. This requires adjustments be made to the mill gap. If you mill too course, it will negatively impact your efficiency. Milling too fine can result in a stuck mash. Proper adjustment is critical to quality wort production. The gap of the mill rollers can be adjusted to ensure uniform milling. To adjust the gap, revolve the large knobs on the front of the mill, the knobs will adjust the width of the feed opening to a larger or smaller gap depending on the direction you revolve the knobs. **NOTE**: The flow rate of raw material is also likely to change.

Method 1 – Feeler Blade

A. Disconnect power to the mill and lockout.

B. Pass a feeler gauge between the rollers at both ends.

C. It is important that the rollers remain parallel.

D. Set the gap to .032 by adjusting the hand wheels. The mill is marked for opening and closing the rollers.

E. Mill a sample of barley and analyze.

F. Adjust as needed.

Method 2 – Sieving Barley

A sieve analysis (or gradation test) requires a set of US standard test sieves. (not included). Once the mill gap is initially set by a gap measurement a sieve analysis will fine-tune the gap to your lot of barley.

1. Place three rubber balls on each of the US standard test sieves #14, #30, and #60

2. Place the bottom pan under the #60 test sieve. They must be stacked in the proper order with the widest screen being on top (#14) and the finest (#60) on the bottom above the pan.

3. Weigh 100 grams of the milled grain sample.

4. Place the grain into the top sieve

5. Put the lid on.

6. Place the sieves on a smooth surface.

7. Slide the test sieves back and forth for 3 minutes.

- **a.** The sieves need to travel 18" in one direction and then the other, taking 0.5 seconds each way for a total cycle time of 1.0 second. Every 15 seconds you tap the sieves and pat downward on the working surface.
- **b.** Maintain this pattern for 3 minutes total.

10. Empty each individual sieve, being sure to brush them out completely, then weigh and record the results.

11. Calculate the percentage for each sieve by dividing each fraction by the sum of all fraction weights then multiply by 100.

Example: #14 + #30 + #60 + Pan = Sum then X / Sum * 100 = percentage.

Since we are using 100 grams of sample material, the percentages will be very close to their original fractions.

TABLE 2

	#14	#30	#60	Pan	Max efficiency
Trouble-Free	75–80	10–20	<10	<5	95%
Practical	45–55	20–25	5–15	<7	98%
Industrial	30–35	40–60	5–15	<10	100%
Mash Filter	10–20	20–40	40–50	10–20	102%

Method 3 – Paper Method

Put 16 Bond paper into the space between the two rollers and turn the fast roller so that the paper can pass through. Once the paper is passed through, you can calculate the evenness of the interval between the two mill rollers by observing the distribution of indentations.

1. Disconnect power from the mill.
2. Cut a piece of paper 4" long with a width of 0.9 times the length of a mill roll.
3. Feed through the gap while turning the rollers by hand.
4. Measure the indentation three different times and take the average of the measurements.
5. Adjust the gap till the thickness is even across the length of the paper.

To test, put the raw material into the feeding hopper. Adjust the gap according to the crushing requirement. Rotating the left and the right-hand wheel and adjusting the flow control knob.

TROUBLESHOOTING

Reason	Solutions
The flow is slow	Adjust the gate to appropriately increase the flow.
Mill roller gap is not consistent	Adjust the hand-wheel till the gap is consistent. Refer to Chart 1 on page 3.
Big spring collapsed	Adjust the lock nut and loosen the adjuster.
Gears scuffing	As the roller wears smaller the gears get closer together. According to the roller use status, replace or change the gear.
Slow Speed	Swap pulleys to adjust the speed according to requirements.
Mill Stuck	Stop the mill. Close the gate. Open the roller gap till the mill is clear. Restart the mill. Readjust the rollers.

STORAGE

Keep the mill in a well-ventilated and dry place. Do not keep in the wind, rain, or sun.

When properly maintained and used your mill will provide decades of reliable service.

Following the steps in this manual to ensure proper setup, cleaning, maintenance, and use will keep the mill providing decades of reliable service. If you have any questions, please contact our customer service team at 1-800-600-0033 or support@moreflavor.com