



**SASQUATCH™
ROLLER MILLS**
MALT MILLS FOR BREWERS & DISTILLERS



Flagship Modular Mill



6x6 Brewpub Mill



Proudly Made In The USA



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Thank You!

Thank you for your purchase of a **Sasquatch Roller Mill**! Your roller mill is patented and was carefully and thoughtfully designed with you, the customer and end user, in mind. It's controls are simple, user-friendly, and very intuitive. The mill has been manufactured in the U.S.A. from the highest grade materials providing both durability and reliability. If properly operated and cared for, your **Sasquatch Roller Mill** will prove to be the workhorse you need it to be everyday.

Unique Features of the Sasquatch Roller Mill

Your **Sasquatch Roller Mill** has been designed with some unique features that will ensure high productivity, low maintenance costs, high efficiency, and scalability as your operation grows. When designing the mill, we started with a clean sheet of paper so as to afford our customers the very latest in cutting edge technology and innovation. We wanted the mill to be able to service the small enterprises as well as larger operations. We wanted the mill to be able to grow with the company so that their investment in the mill is a wise investment and continues to work for them for many years.

- **Stackable Modularity – Sasquatch Roller Mills** are the only modular roller mills available in the marketplace today and they have been issued a US patent and have other US patents pending. Stackable modularity means that your mill can grow as your business grows without having to replace it with a larger mill. If you start with a 2-roll mill and find that you need a bit more throughput from the mill at a later date, you can upgrade the mill by adding a second grind module, making it a 4-roll mill, and upgrading the motor. See **Addendum G** for details.
- **Modular Options – Sasquatch Roller Mills** also have the ability to add very desirable options into the stack either at the time of original purchase or at anytime thereafter. Optional modules include but are not limited to a Weigh Module, a Metered Feed Module, and a Screening Module.
- **Automated Roll Gap Controls – Sasquatch Roller Mills** come *standard* with a manual analog roll gap adjustment via the hand wheel dials on the front of the mill. An optional **Auto-Adjust** feature provides for digital controls of the roll gap and can be retro-fitted to the mill at any time. The **Auto-Adjust** feature also affords our customers the ability to remotely control the mill, and, since the **Auto-Adjust** is completely programmable, the mill can be programmed to remotely set the rolls to any recipe setting that is needed.
- **Automated Blast Gate Control – Sasquatch Roller Mills** come *standard* with a manual rotary adjustment to open the blast gate to feed product into the mill. While this is quite adequate for most applications, it requires the operator to monitor the ammeter so as to not overload the mill. When the mill is shut down the blast gate should be closed and if left in the open position, it can lead to mill jams. An optional **Auto-Positioner** can be added that opens and closes the blast gate based upon the load on the mill. This assures that the mill never exceeds its maximum load and helps prevent mill jams.



About This Manual

From initial concept and design through its final production, your **Sasquatch Roller Mill** is built to give you years of trouble-free use. To ensure it provides that service, and to avoid injury, it is critical that you read this entire manual prior to attempting to install or operate your new **Sasquatch Roller Mill**. Become familiar with the terms and diagrams, and pay close attention to the highlighted areas with the following labels:



DANGER! Emphasizes an area in which personal injury or even death **will** result from failure to follow instructions properly. Mechanical damage may also occur.



WARNING! Emphasizes an area in which personal injury or even death **may** result from failure to follow instructions properly. Mechanical damage may also occur.



CAUTION! Failure to observe a “Caution” may cause damage to the equipment.



IMPORTANT! These boxes contain information that illustrates a point that may save time, or be key to proper operation, or clarifies a step.

At Oronoko Iron Works, your satisfaction with our products is paramount to us. If you have questions or need assistance with your product, please contact us at 1-269-326-7045 (M-F 8 AM–4 PM ET).

Safety Information



DANGER! Electrical wiring should be performed with extreme caution and in compliance with local, state, and national electrical codes that are appropriate for the intended use of the roller mill. Threaded rigid conduit, sealed fittings, and conductor seal should be used where applicable. The roller mill must be properly grounded. If installation is in deviation of this manual, a licensed electrician must perform the installation. Improper installation or use of the roller mill **will** result in bodily injury or death.



WARNING! To ensure the safe and proper operation of your roller mill, it is critical to read and adhere to all of the safety warnings and precautions. Failure to follow the instructions below or improper installation or use of the roller mill **may** cause bodily injury or death!



Operational Safety



WARNING! Operation of the mill with the electrical panel door open and interlocks defeated or over-ridden is a very dangerous practice and should not be done except by licensed electrical professionals working in a maintenance capacity. Improper operation or use of the roller mill **may** result in bodily injury or death.



WARNING! Operation of the mill with the belt drive safety guards removed is a very dangerous practice and should not be done except by properly trained professionals working in a maintenance capacity. Improper operation or use of the roller mill **may** result in bodily injury or death.



WARNING! Rotating Machinery. When the mill is running, it generates a large amount of centrifugal force and momentum. When the mill is shut down it takes a certain period of time before all of the energy is dissipated and the mill stops. During this time it is not safe to remove any of the drive safety guards and should not be done except by properly trained professionals working in a maintenance capacity. Improper operation or use of the roller mill **may** result in bodily injury or death.



CAUTION! Operation of the mill with the feed hopper magnet removed **may** result in major equipment damage. The magnet is in place to assure that no ferrous material goes through the mill and removing it **will** void the warranty.



CAUTION! Operation of the mill with the feed hopper door propped or tied in the open position is unsafe and not recommended.



CAUTION! When operating the mill make sure to read and follow all safety decals and equip yourself with appropriate hearing and eye protection, along with other appropriate safety gear.



CAUTION! The mill will become warm during normal operation and may become very warm if operated in continuous duty. Be aware that exterior metallic surfaces of the mill and the motor may be warm to the touch and may be hot enough to burn the skin.



Maintenance Safety



WARNING! When tensioning the drive and cascade belts, proper lockout and tagout procedures must be followed and should only be performed by properly trained professionals working in a maintenance capacity. Improper operation or use of the roller mill **may** result in bodily injury or death.



WARNING! When replacing or servicing the drive and cascade belts, proper lockout and tagout procedures must be followed and should only be performed by properly trained professionals working in a maintenance capacity. Improper operation or use of the roller mill **may** result in bodily injury or death.

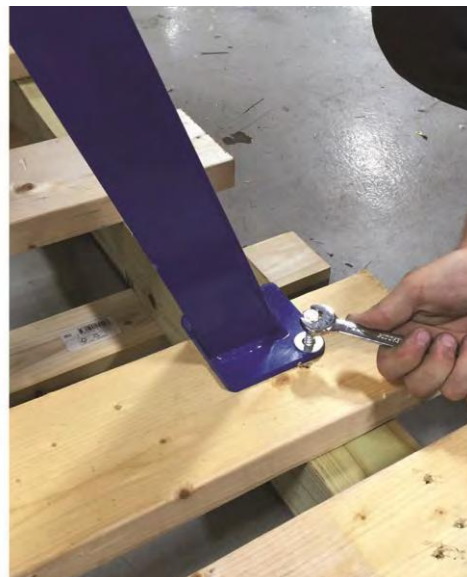
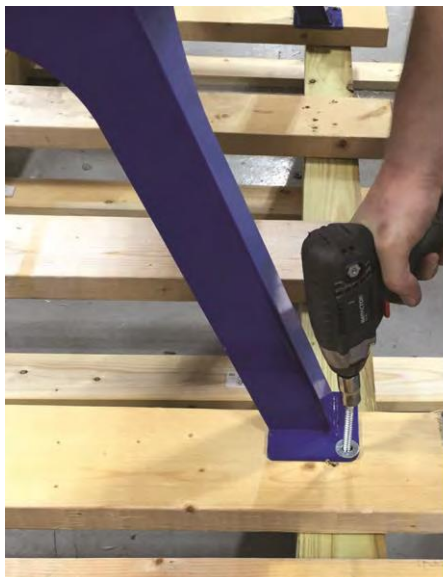


WARNING! When greasing or otherwise servicing the bearings, proper lockout and tagout procedures must be followed and should only be performed by properly trained professionals working in a maintenance capacity. Improper operation or use of the roller mill **may** result in bodily injury or death.

Section 1. Uncrating the Mill

Your **Sasquatch Roller Mill** is carefully crated at the factory to assure that it arrives undamaged at your facility. In the event that you observe any damage to the crate, contact the carrier for instructions how to proceed.

The crate is constructed of plywood panels and a wooden skid base, and the panels are held in place by standard drywall screws. Remove all of the panels exposing the mill mounted to the skid. Remove the lag screws and the mill is ready to be installed. (See photos below.)





Section 2. Installing the Mill

Your **Sasquatch Roller Mill** is designed to operate on a solid flat surface like a concrete floor. There should be at least 24" of clear space all around the mill, and the mill must be installed within a reasonable distance of the control panel. The mill needs to be installed in a location that is well ventilated and as level as possible, and that affords adequate room for the product infeed and product take-away conveyance systems. It is required that the mill be permanently anchored in place with anchor bolts.

The roll gap adjusting dials are shipped in separate boxes and are not installed into their hand wheels during shipment to protect them from vibration and jarring. Before installing the dial, it must be "zeroed". Simply hold it vertically and spin it in your hand until both arrows are on "zero". See far left photo. Once zeroed, the dials can be installed into the hand wheels as indicated in the photos below.



IMPORTANT! Correct installation of your mill is critical and the key to its proper operation and continued trouble-free service. Operators and maintenance personnel must be able to have free and open access to all areas of the mill in order to assure it is running and maintained correctly. Adequate ventilation is necessary for proper cooling of the mill, and the installation site should lend itself to easy cleaning.



IMPORTANT! Attention should be paid to providing the correct power requirements to the mill installation site. Your approval drawing indicated your choice for power required to operate the motor supplied with your mill. The length of the power drop should be limited to 30 feet to avoid any power drop situations which would result in poor mill performance.



IMPORTANT! Once power is connected to the control system the direction of rotation of the motor must be established before operating the mill. An arrow on the belt guard at the motor indicates the required direction of rotation.



Section 3. Operating the Mill

Your **Sasquatch Roller Mill** is designed to operate with a minimal amount of controls and these controls are both user friendly and very intuitive. Before the mill can be turned on, the roll gap must be set. See photo below. **Addendum A** contains a mill startup checklist which should be printed and prominently posted near the mill. It should be employed every time the mill is turned on.



Roll Gap Adjustment is the key to achieving the desired grind from the mill. All roll sets are shipped in a “zero” condition meaning they are parallel to each other and just barely touching. The roll gap is adjusted by turning the hand wheels left (CCW) or right (CW) according to whether you want to increase or decrease the roll gap. Right (CW) makes the rolls closer and left (CCW) separates the rolls. The roll gap adjustment must be done simultaneously by rotating both hand wheels the same amount at the same time. This helps assure that the rolls remain parallel.

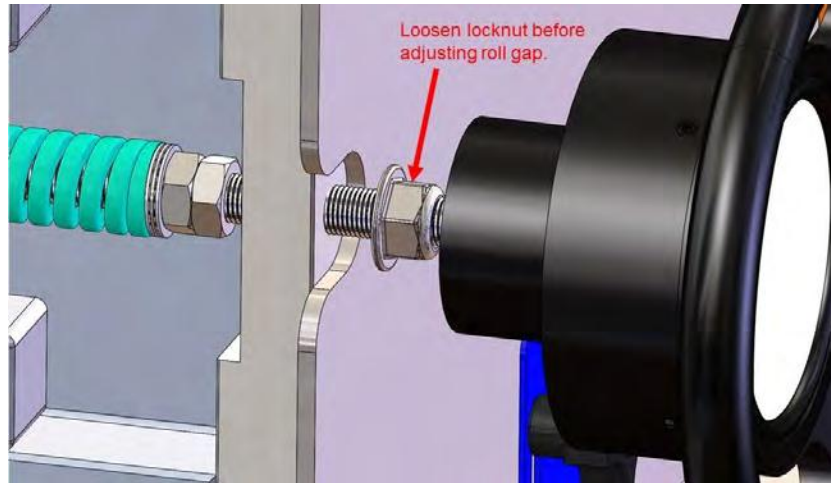


WARNING! The mill must not be started until the roll gap is properly set. Never run the mill in a production setting with the rolls touching. Failure to comply **may** result in bodily injury and damage to the equipment, and **may** void the warranty!



IMPORTANT! Keeping the rolls parallel at **all** times is critical to achieving a product grind that is both consistent in quality and uniform in particle size. It is also a key ingredient in attaining the mill throughput that is desired and minimizing bearing maintenance.

Setting The Roll Gap. The roll gap adjustment system employs a linear adjuster, a shock absorber, and a thrust bearing to ensure that the mill operates properly and provides the desired grind. Locknuts are in-place to assure that once the roll is adjusted it stays in-place. The locknuts must be loosened and backed off sufficiently to allow for the desired roll gap before adjusting the roll gap. Once the gap is set where desired, tighten down the locknuts. (See Photo Below)

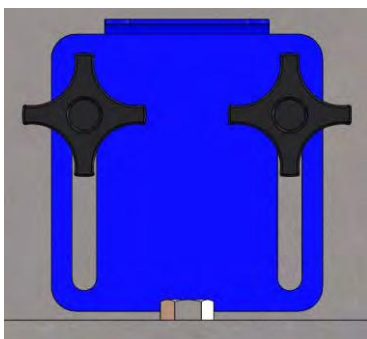


CAUTION! Never try to adjust the roll gap until the locknut is loosened. Never over-tighten the locknuts when locking them back down after adjusting the roll gap. Failure to comply **may** result in damage to the equipment and **may** void the warranty.

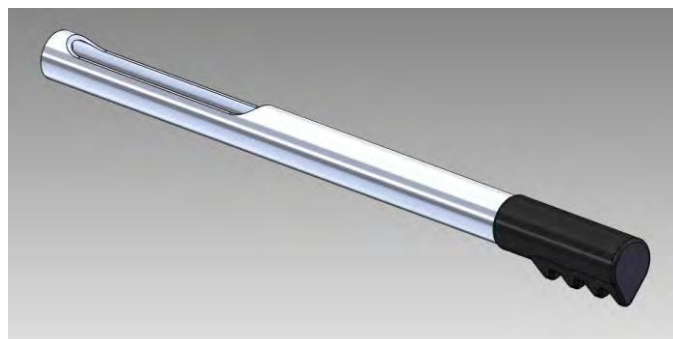
Initial Grind Setting. To setup the mill for the first grind determine what particle size is desired based upon the material being ground. If your mill has only one set of rolls, this will be the gap setting.

In mills with multiple sets of rolls, the top set of rolls does the most work since this is where “cracking” occurs. The usual gap setting here varies based upon the shell hardness of the material being ground and the initial particle size. The other set(s) of rolls are then set at graduated gaps that finalize the grind to arrive at the desired particle size. The mill speed is set so that the bottom set of rolls, in a multi-roll system, runs the fastest and the upper set(s) of rolls run progressively slower, which effectively pulls product through the mill.

Your mill is also supplied with a **Sample Port** on each set of rolls and a **Sample Wand** to be able to sample the product as it is being ground. (See Graphics Below) Loosen the locknuts on the adjuster and set the gap simultaneously on both sides to the desired position on all sets of rolls. Run a test sample through the mill and use the Sample Wand to determine if the grind setting is acceptable. Repeat this process until the sampling produces the desired particle size. Tighten the locknuts back down and you are ready to begin milling in a production setting.



Sample Port



Sample Wand



Setting the Blast Gate. The Blast Gate regulates how much product from the feed hopper passes into the mill at a given time. It is a simple slide gate that opens and closes by use of the manually operated rotary actuator. It has a hand wheel that opens the blast gate by rotating it to the right (CW) and closes is by rotating it to the left (CCW).



CAUTION! Never run the position indicator past the “Full Open” or “Closed” position. Failure to comply **will** result in damage to the mill, and **may** void the warranty!



Slide Gate



Rotary Actuator Hand Wheel



Position Indicator

There are three interdependent factors that will determine how your mill performs, and these three are “Mill Condition”, “Blast Gate Position”, and “Ammeter Reading”. The Blast Gate Position must always be dictated by the Mill Condition and the resulting Ammeter Reading. When starting to grind, slowly open the Blast Gate while monitoring the ammeter until it reaches Full Load Amps.

Please see the **Mill Operational Matrix** below. Having the mill perform at its peak and achieving the maximum throughput requires that these settings become the operational standard for all operators who run the mill.

Mill Operational Matrix		
Mill Condition	Blast Gate Position	Ammeter Reading
Motor Not Running	Closed	Zero
Motor Startup	Closed	Startup Amps*
Motor Running - Not grinding	Closed	Idle Amps*
Motor Running - Grinding	Slowly Open	Full Load Amps*
Motor Shutdown	Closed	Zero
* Startup Amps, Idle Amps, and Full Load Amps (FLA) will vary with each motor. FLA may be found on the motor nameplate		



CAUTION! Never allow the mill to exceed Full Load Amps while grinding product. Continuous operation above Full Load Amps **will** result in the mill shutting down, **may** result in damage to the mill, and **may** void the warranty!



IMPORTANT! Managing the position of the blast gate throughout the grinding process is absolutely critical to assuring that there are no mill jams due to product being packed into the mill. The Blast Gate must never be opened unless the motor is running.



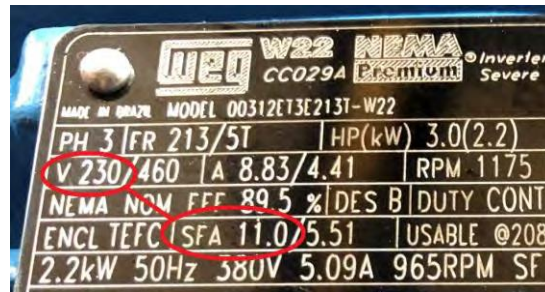
Starting the Mill. Once the roll gap is set on all rolls and the blast gate is fully closed, it is time to start the mill. Any conveyance systems installed to take the ground product away from the mill should be started first. The mill motor controls that you have installed will determine how you start the mill motor. Start the mill motor. It will wind up slowly to full speed so allow adequate time for it to reach full speed before proceeding to the next step.



IMPORTANT! Never allow the feed hopper door to remain open while grinding product. Close after every manual filling.



IMPORTANT! Locate the mill motor nameplate and determine the Full Load Amps value for your system. It may be abbreviated as FLA or SFA. See photo below



Filling the Feed Hopper. The Feed Hopper can be either manually filled using bagged product or automatically filled by an in-feed conveyance system. Either way, the Feed Hopper serves as a surge hopper to assure that an adequate amount of product is available for grinding for a reasonable amount of time. It provides for a smooth and continuous flow of product into the mill once production is started.



CAUTION! Never fill the Feed Hopper, either manually or automatically, unless the Blast Gate is in the “Fully Closed” position. Failure to comply **may** result in damage to the mill, and **may** void the warranty!

If filling the feed hopper manually, open the hopper door on top and add product until it fills near the top. Spread product around to more completely fill the feed hopper until it is full and then close the door.



IMPORTANT! Never allow the feed hopper door to remain open while grinding product. Close after every manual filling.

If filling the feed hopper automatically, start the conveyance system and observe the filling of the feed hopper with the hopper door on top.

Open the Blast Gate & Start Milling. Once the Feed Hopper is full and the takeaway conveyance system is running, open the Blast Gate slowly by turning the handwheel to the right or clock-wise direction. Continue to open the blast gate slowly while monitoring the Motor Amps on the ammeter provided until the ammeter indicates that the motor is running near or below Full Load Amps. Once running near or below full load amps, do not open the blast gate any further. The mill can continue running at this setting.

Shutting Down the Mill. When milling is completed and all ground product has cleared the mill, 1st - close the blast gate, 2nd - stop the mill motor, and 3rd - stop the takeaway conveyance system in that order.



Section 4. Routine Maintenance

Your **Sasquatch Roller Mill** is designed to operate with a minimal amount of maintenance required. However, the routine maintenance items covered in this section must be performed at the intervals listed in order to assure the performance and longevity of the mill. **Addendum B & Addendum C** contain comprehensive and detailed mill maintenance instructions which should be printed and prominently posted near the mill.



CAUTION! All of the drive belts must be inspected for correct tension and overall belt health at least once every 40 hours of operation! Failure to comply **may** result in damage to the mill, and **may** void the warranty. See **Addendum B** for specific instructions.



CAUTION! All of the bearings and slides must be greased at least once every 40 hours of operation! Failure to comply **may** result in damage to the mill, and **may** void the warranty. See **Addendum C** for specific instructions.



IMPORTANT! The outside surfaces of the mill, including the motor, should be thoroughly cleaned on a monthly basis with moderate mill usage. Heavy mill usage will require more frequent cleanings.



IMPORTANT! The Mill Magnet, which is located inside the feed hopper, should be thoroughly cleaned on a quarterly basis to assure that no ferrous objects get into the mill.



IMPORTANT! The interior surfaces of the mill should be thoroughly cleaned on a quarterly basis with moderate mill usage. Heavy mill usage will require more frequent cleaning.



IMPORTANT! The front and rear motor bearings (on applicable motors) must be greased every 40 hours of operation. See **Addendum E** for motor maintenance instructions.



Section 5. Clearing a Jam - Part 1 - Product Jam

One of the most common problems that occurs when a new mill is installed is jamming the mill with product. This usually occurs when product is placed into the feed hopper with the mill not running and the blast gate in the open position. The product is then free to fall into the grinding module, and, depending on the roll gaps, some may go all the way through the mill. If the takeaway conveyance system is not running the product will quickly pile up. In multi-roll systems most of the product may be jammed into the upper sets of rolls.

Unfortunately, many jams are not detected until the mill motor is started which jams the product into the rolls even tighter and results in the motor overloading and shutting down. The following steps must be followed completely, and in sequential order, to safely clear the jam.



CAUTION! All work must be done by qualified maintenance personnel. Never attempt to clear a jam by repeatedly cycling the mill motor on and off. Failure to comply **may** result in damage to the equipment and **will** void the warranty!

STEP 1 - Shut down the mill motor and all other conveyance systems motors that are running.

STEP 2 - Follow standard Lockout – Tagout procedures to assure that the mill and all associated equipment is totally off.

STEP 3 - Close the Blast Gate. If it is jammed, remove product from the feed hopper until you can free it and then close it.

STEP 4 - Remove the safety cover plates on both sides of the mill so that all belts and pulleys are accessible.

STEP 5 - Adjust the motor base and move the motor forward to fully relieve the drive belt tension.

STEP 6 - Starting at the bottom set of rolls, and using proper procedure, widen the roll gap to the maximum possible gap.



CAUTION! Assure that proper roll gap adjusting procedure is followed by simultaneously adjusting both sides of the roll to the maximum open gap setting which will be about 3/8". Failure to follow standard roll adjusting procedure **may** result in damage to the equipment and **may** void the warranty!



IMPORTANT! As the roll gap is widened product will begin to fall through the rolls into the discharge hopper or onto the floor. Only one set of rolls should be adjusted to fully open at a time, and all product from that individual module should be allowed to fall out completely before going to the next set of rolls.

STEP 7 - Repeat Step 6 on the next set of rolls up until all rolls are opened to the maximum gap.

STEP 8 - Starting at the bottom set of rolls, alternatively grab the front & rear drive pulley and attempt to rotate each roll.



CAUTION! Never attempt to rotate the rolls using a pipe wrench or any other type of force multiplier. When the rolls are free, and not jammed, they rotate very freely by hand. (See photos below) Failure to comply **may** result in damage to the equipment and **will** void the warranty!



Proper Procedure



Improper Procedure

STEP 9 - Continue rotating the rolls until no more product is falling through the mill and the rolls turn very freely.

STEP 10 - Starting with the top set of rolls and using proper adjusting procedure, return all roll gaps to .035".

STEP 11 - Following the instructions in **Addendum B** properly tension the drive belt and cascade belts if applicable.

STEP 12 - Remove the Lockout-Tagout on the mill motor and start the mill motor.

STEP 13 - Following the instructions in **Addendum B**, "zero" the bottom rolls and continue upward until all rolls are zeroed.

STEP 14 - Using proper procedure re-set the roll gaps to the production setting.

STEP 15 - Stop the motor and replace the side guards and all other items that were removed.

STEP 16 - Remove the remaining Lockout – Tagouts and return the mill to service.

Section 5. Clearing a Jam - Part 2 - Foreign Object Jam

Occasionally, a foreign object makes its way into the mill causing the mill to jam. This usually occurs when the mill is being fed manually through the top door in the feed hopper or when the mill is down for maintenance and being serviced and objects get accidentally dropped into the feed hopper. The feed hopper is equipped with a magnet in the flow path to trap small ferrous materials that may be present in the product. And depending upon where the foreign object is located in the mill when it jams, it may also cause the mill to be jammed with product.

The mill is designed to pass small solid objects through without extensive damage. The shock absorbers incorporated into the roll adjustment system provide for this feature, and allow an object of about 3/8" to pass through. If a solid object does pass through the mill a very loud sound will be generated. In the photo below a 20mm wrench has obviously passed through the mill without jamming it, and without significant damage to the mill.



To clear the mill of a foreign object, attempt to follow steps 1 through 16 above. If Step 8 & 9 cannot be performed and the rolls are not spinning freely, it will be necessary to disassemble the mill one module at a time until the jammed roll set is exposed. It is recommended that the jammed module be removed and placed on a bench for clearing to prevent other objects from falling into the mill. Increasing levels of disassembly will likely be needed in order to free the rolls of the foreign object. Once the jam is cleared, reassemble the module and, following standard procedures in **Addendum B**, re-zero the rolls. Return the module to the mill and reassemble the mill. Starting at Step 10 above continue the process until the mill is returned to service.



ORONOKO

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ADDENDUM A

Start-up Check List

Daily Visual Inspection

Verify that all of the following are accomplished before starting the mill.

- 1 Are there any LOCKOUT-TAGOUT tags visible? If so, go no further and contact supervisor immediately
- 2 Is the Blast Gate closed? NEVER start the mill with the Blast Gate open!
- 3 Are all safety guards in-place and fasteners tight?
- 4 Are the rolls set properly for gap and parallelism?
- 5 Are all sample port covers closed?
- 6 Are all motor mounting and adjustment bolts tight?
- 7 Does the motor appear to be parallel to the back of the mill?
- 8 Is the feed hopper in-place and tight?
- 9 Is the discharge hopper and takeaway conveyance system in-place and tight?
- 10 Is the power to the control panel on?



ADDENDUM B

Tensioning The Belts & Zeroing The Rolls

Section 1 - Tensioning The Belts

One of the most important factors to the reliable operation of your Sasquatch Roller Mill is assuring that all belts are tensioned properly. Without proper tension and under heavy load, the mills supplied with a Cog Belt drive belt may skip a cog on the drive pulley, and the mills equipped with V-Belt drive belts may slip on the sheave which, in both cases, will place an excessive shock load on the drive belt and will eventually cause it to fail.

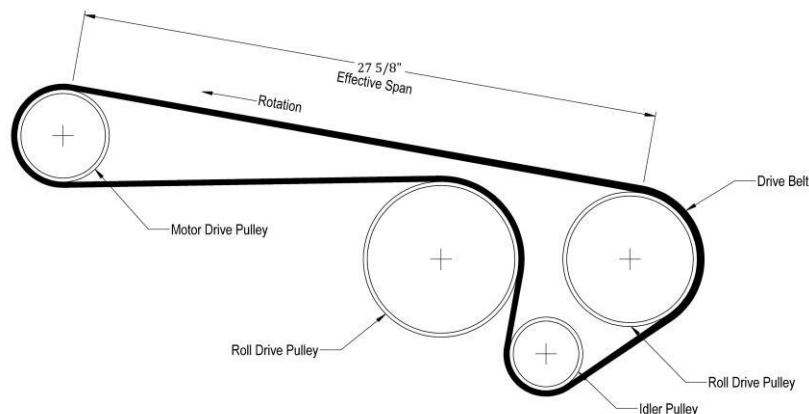
When your mill was assembled, all belts were tensioned properly and have already been run for a short period of time. New belts will stretch a little as they wear-in, so checking the tension on a new machine several times shortly after installation is very important.

It is important that you set up a regular maintenance procedure to check the belt tension in accordance with the time table shown below. If you notice any unusual operational issues, the belt tension is always a good place to begin troubleshooting.

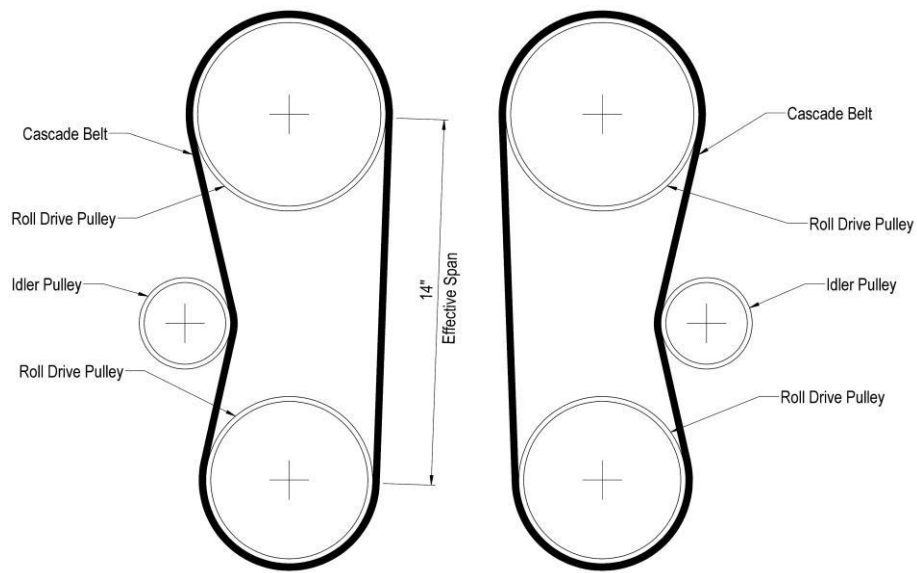
Brewery Service - at least once every 40 hours of operation, or once per month whichever is shorter.

Distillery Service - at least once every 25 hours of operation, or once per month whichever is shorter.

There are three steps to the tensioning process. If a new Drive Belt or Cascade Belt is being installed, make sure that the belt is installed per the belt paths shown below.



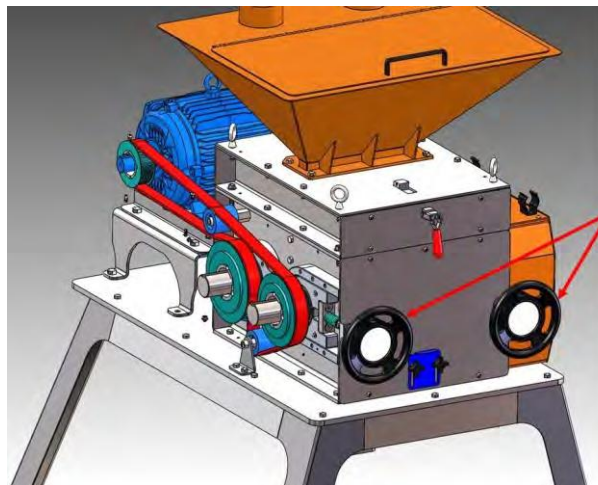
Drive Belt Path



Cascade Belt Path

Step 1 – Set the roll gap to .035”

For Drive Belt & Cascade Belts

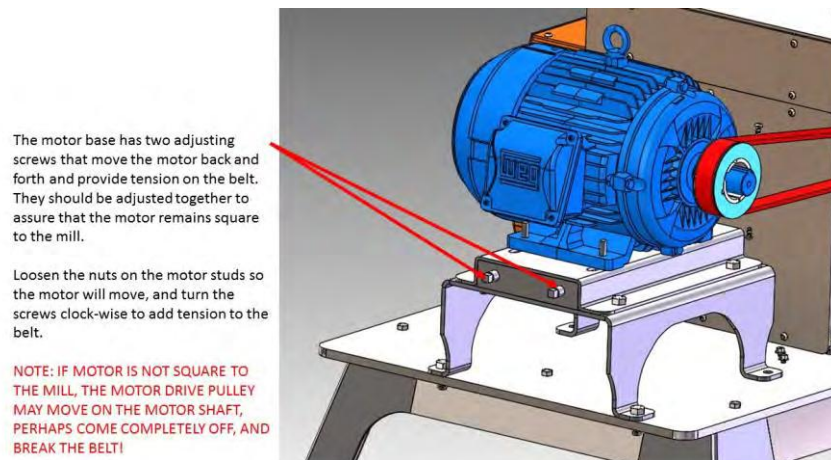


Loosen lock nuts before turning hand wheels. Simultaneously set roll gap on both sides to 0.035”.

After belt tensioning process is completed, set the roll gap where desired for production and re-tighten lock nuts.

Step 2a – Add drive belt tension by adjusting motor base

For Drive Belt Only



The motor base has two adjusting screws that move the motor back and forth and provide tension on the belt. They should be adjusted together to assure that the motor remains square to the mill.

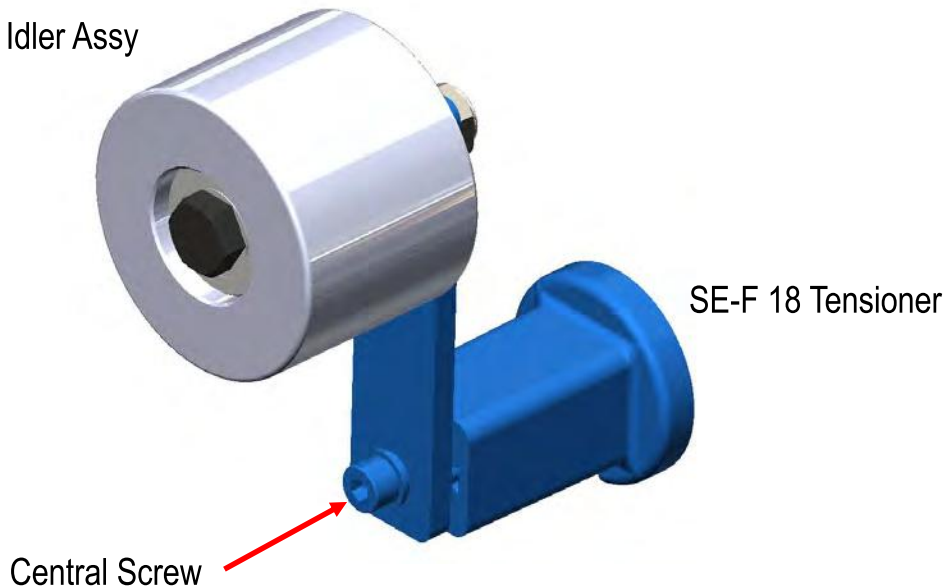
Loosen the nuts on the motor studs so the motor will move, and turn the screws clock-wise to add tension to the belt.

NOTE: IF MOTOR IS NOT SQUARE TO THE MILL, THE MOTOR DRIVE PULLEY MAY MOVE ON THE MOTOR SHAFT, PERHAPS COME COMPLETELY OFF, AND BREAK THE BELT!

Step 2b – Add cascade belt tension by adjusting the Rosta tensioner

For Cascade Belts Only

9000M-1220 Idler Assy



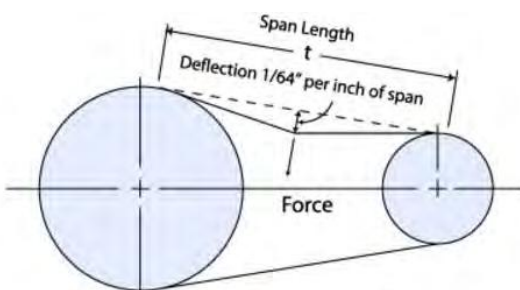
Loosen the Central Screw so that the SE-F 18 Tensioner can be rotated to add tension to the belt. Using a wrench, rotate the body of the tensioner until the correct tension is reached and then re-tighten the central screw. Re-check tension to assure that it is correct.

Step 3 – Use the Belt Tension Gauge to set the belt tension.

There are many types of belt tension gauges available on the market, and any type will work as long as the instructions are followed. All new Sasquatch Roller Mills come with a Dodge Belt Tension Gauge included as shown below.



The most common process for checking belt tension is illustrated below. Consult the table to determine the correct deflection and span for each belt that will allow you to set the proper tension.



Belt Tensioning Data				
Belt Type	Belt Location	Tension Req'd	Effective Span	Deflection
Cog Belt	Main Drive	30 Pounds	27 5/8"	3/8"
V-Belt	Main Drive	11 Pounds	27 5/8"	3/8"
V-Belt	Cascade Belt	11 Pounds	14"	7/32"

Slide the large O-ring on the gauge to the correct deflection value on the inch scale listed in the table. Slide the small O-ring on the gauge to zero.

For the drive belt, place a straight edge on the belt from the top of the drive pulley to the back grinding roll. Place the non-rubber end of the gauge against the belt and push down on the rubber end until the large O-ring is aligned with the straight edge. Look at the small O-ring and read the value which is the actual tension on the belt.

For the cascade belt, place a straight edge on the belt from the top roll drive pulley to the bottom roll drive pulley. Place the non-rubber end of the gauge against the belt and push down on the rubber end until the large O-ring is aligned with the straight edge. Look at the small O-ring and read the value which is the actual tension on the belt.

Continue adding (or removing) tension to the belt until the proper deflection is reached which will read the correct tension value on the gauge.

Section 2 – Zeroing The Rolls

A critical part of achieving the desired product grind is the proper positioning of the grinding rolls. There are two factors that determine the proper position of the rolls which are roll gap and roll parallelism. Setting the roll gap has been covered in the manual. Zeroing the rolls will help assure that they are parallel and remain that way.

When your Sasquatch Roller Mill left the factory the rolls were properly zeroed and set to a roll gap of “0”. That means that the rolls are very lightly touching each other all along the face of the roll. **The mill must not be started or operated in this condition.**

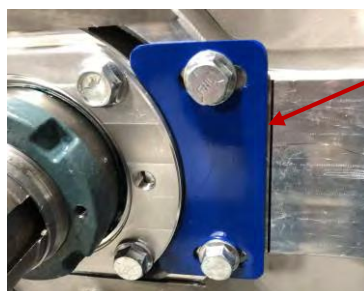
Step 1 – Pre-stage the rolls.

With the motor off and using proper roll gap setting procedure as outlined in Section 3 of the manual, set the roll gap to .035”

With the motor still off and using proper procedure for moving the rolls, turn both hand wheels simultaneously until both sides lightly touch the dead stop. Do not over-tighten against the dead stop. Verify that the position dial is indicating a reading of zero. If they are not reading zero, consult Section 2 of the manual and follow the instructions to zero the position dials.

Note: For Older mills without the dead stop - turn both hand wheels simultaneously until both sides of the front roll touch the back roll very lightly.

Using proper procedure, back the rolls out to .010”. Repeat the process for any other sets of rolls that need to be zeroed.



Hard Stop

Step 2 – Perform Zeroing Process

Start the motor and let the mill attain full speed. Using proper procedure, slowly bring both sides of the roll up to the point where you can hear the metallic sound of the rolls touching. Run the controls back and forth very slightly to verify that the rolls are just barely touching each other. Verify that the position dial is reading zero. Once accomplished, back the rolls out to .035" and repeat the process on any other sets of rolls that need to be zeroed.



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ADDENDUM C BEARING & SLIDE GREASE

We have recently updated our manual to clarify our lubrication requirements and include additional information on performing preventive maintenance at regular intervals. The bearings and front bearing slides on the main rolls are greased at the factory with a premium quality, food machinery grade, grease. It has a designation of NLGI #2, and has an *Aluminum Complex* Thickener, and is not to be mixed with certain other types of greases.

There are also other materials that can be used as thickeners. These may or may not be listed on the packaging, so it is very important to make sure the grease you are using is compatible by consulting the chart below (Table 1) and a Technical Data Sheet or MSDS from the grease manufacturer. While most of these greases are acceptable individually, *many are incompatible and must NEVER be mixed together*. That means that if you are using now, or plan to use, grease that does not have an *Aluminum Complex* Thickener, you need to follow the procedure listed below for completely purging the system of mixed grease. **In instances where grease has been mixed, it is imperative that this operation be performed immediately; failure to do so may result in premature wear and/or failure, and will void the warranty if any remains.**

Table 1



Bearing Lubrication Lubrication Compatibility Chart

	AL COMPLEX	BARIUM COMPLEX	CALCIUM	CALCIUM COMPLEX	CLAY	LITHIUM	LITHIUM COMPLEX	POLYUREA	SODIUM	
AL COMPLEX	White	Red	Red	Red	Red	Yellow	Yellow	Yellow	Red	INCOMPATIBLE COMPATIBLE BORDERLINE
BARIUM COMPLEX	Red	White	Red	Red	Red	Red	Red	Red	Red	
CALCIUM	Red	Red	White	Green	Red	Green	Green	Green	Red	
CALCIUM COMPLEX	Red	Red	Green	White	Red	Yellow	Yellow	Yellow	Red	
CLAY	Red	Red	Red	Red	White	Red	Red	Red	Red	
LITHIUM	Yellow	Red	Green	Yellow	Red	White	Green	Yellow	Yellow	
LITHIUM COMPLEX	Yellow	Red	Green	Yellow	Red	Green	White	Yellow	Yellow	
POLYUREA	Yellow	Red	Green	Yellow	Red	Yellow	Yellow	White	Red	
SODIUM	Red	Red	Red	Red	Red	Yellow	Yellow	Red	White	

REQUIRED MAINTENANCE PROCEDURE

In cases where different types of grease have been mixed, the bearings and slide surfaces must be purged of the grease that is currently inside and replaced with a recommended grease of your choice. At the factory, 100 pumps of grease, using a standard 14oz grease gun cartridge or electrical equivalent, is put into each bearing. Follow the steps below to purge the bearings.

Bearing Purging Procedure

1. Assure that the mill is totally empty of any grain so that the rolls will spin freely.
2. Assure that the blast gate is closed, and remains so throughout the remaining steps.
3. Assure that the mill is locked out and tagged out and that there is no chance that it may be turned on.
4. Remove all of the safety covers from both sides of the machine so that the belts and shafts are exposed, and the bearings, slides and all grease zerks are accessible.
5. Thoroughly wipe any dust and dirt from where the bearing cartridge goes into the aluminum bearing housing.



6. Start the purging process by pumping 10-15 pumps of grease into the grease zerk and then rotate the roll several RPM to move the grease into and around the bearing.
7. Repeat this process until grease has been pumped into each bearing approximately 100 times, and each slide 20-30 times. In some cases it may be more, and in some cases it may be less. Excess grease will begin exiting the front or rear seals, and has been completely purged when the grease coming out of the seal(s) is the same color as the grease being pumped into the zerks.

WARNING!!!

When rotating the rolls, do it manually by turning the belt pulleys by hand as shown below. **NEVER USE ANY TYPE OF WRENCH TO TURN THE ROLLS. DOING SO WILL DAMAGE THE ROLL JOURNALS AND VOIDS THE WARRANTY.**



8. While pumping grease into the bearing, the existing grease in the bearing will begin to come out as the purging process continues. There are two places the grease will come out, the front side which will be visible, or the backside which will not be visible.



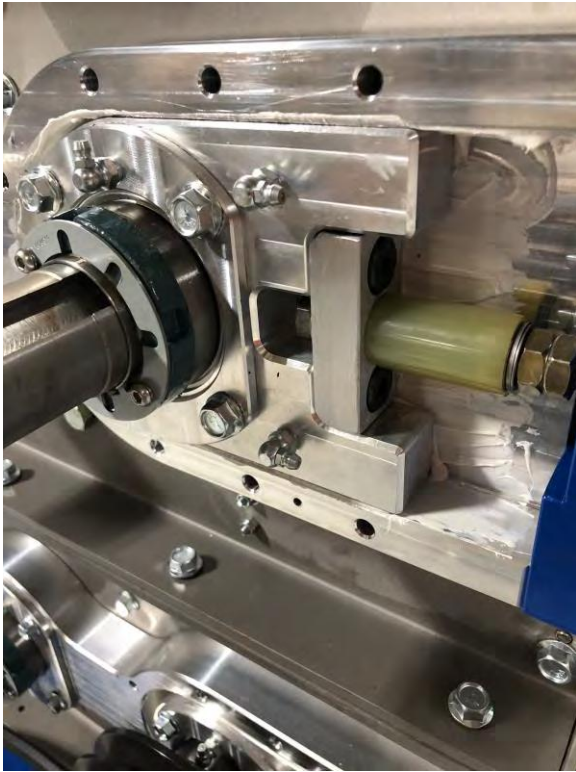
Grease Going Out The Back Seal



Grease Coming Out The Front Seal

9. Continue this process on each bearing until all of the grease has been purged from the bearings. The bearing has been completely purged when the grease coming out of the seal(s) is the same color as the grease being pumped into the zerks.

Bearing Slide Purging Procedure



Grease Zerks & Grease At Front Of Slide



Grease At Rear Of Slide

10. Pump grease into the two Zerks on the bearing slide until you see grease coming out both the front and rear of the slide.
11. Continue this process until the old grease is completely purged from the slide.
12. Replace the safety covers before returning the machine to service.

Recommended Bearing Grease

The grease that is used at the factory and that we recommend is Clarion Food Machinery Grease HT EP Grease, No. 2. HT EP = High Temperature Extreme Pressure. **It is mandatory that an Aluminum Complex grease be used.** We include two tubes of grease with each mill we ship. When you are ready to purchase additional tubes, please call either of the following numbers in order to do so:

Oronoko Iron Works, Inc; 269.326.7045
MaltHandling.com, LLC; 773.888.7718



Bearing Manufacturer's Information

The following information is copied from the Dodge catalog

Operation in Presence of Dust, Water or Corrosive Vapors - Under these conditions the bearing should contain as much grease as speed will permit, since a full bearing with consequent slight leakage is the best protection against entrance of foreign material. In the higher speed ranges too much grease will cause overheating. In the lower speed ranges it is advisable to add extra grease to a new bearing before putting into operation. Bearings should be greased as often as necessary (daily if required) to maintain a slight leakage of the seals.

Operating Temperature - Abnormal bearing temperature may indicate faulty lubrication. Normal temperature may range from "cool to warm to the touch" up to a point "too hot to touch for more than a few seconds," depending on bearing size and speed, and surrounding conditions. Unusually high temperature accompanied by excessive leakage of grease indicates too much grease. High temperature with no grease showing at the seals, particularly if the bearing seems noisy, usually indicates too little grease. Normal temperature and slight showing of grease at the seals indicate proper lubrication.

Oronoko Recommended Grease Schedule

Grease each roll bearing every 40 hours of operation, using as many pumps as necessary, until you can see grease coming out of the seals as described above. There are two bearing zerks on each roll, four total per each module or per set of rolls.

Grease each front bearing slide every 40 hours of operation, using as many pumps as necessary, until you can see grease coming out around the bearing slide. There are two zerks on each bearing slide, or four zerks per module or per set of rolls.

Please note that these figures are for normal operating temperatures at or below 150° F. Continuously operating at higher temperatures may require shorter intervals between maintenance and serve to shorten the overall life of bearings and other components. Ensuring an ambient room temperature below 90° F will result in lower machine operating temperatures when proper lubrication is maintained.

ADDENDUM D - ROLLER MILL TROUBLE SHOOTING CHART

ADDENDUM D - ROLLER MILL TROUBLE SHOOTING CHART										
Electrical Issues	Check - NOTE!!! ALL ELECTRICAL WORK MUST BE DONE BY A QUALIFIED ELECTRICIAN									
Motor will not start	Is electrical voltage correct?	Is main breaker on?	Is control panel on?	Is VFD operational?	Is motor wired correctly?	Is mill jammed?	Any PLC faults need to be cleared?			
Motor turning wrong direction	Is VFD setup correctly?	Interchange any two of the three motor leads								See Addendum E for all pertinent motor information, including the Motor Matrix and the recommended motor maintenance schedule from the motor manufacturer.
Motor running slow	Is electrical voltage correct?	Is motor wired correctly?	Is the wiring run less than 30ft?	Is mill partially jammed?	Has routine motor maintenance been completed?	Is the VFD set properly (See Addendum E)?				
Motor overheating	Is electrical voltage correct?	Is motor wired correctly?	Has routine motor maintenance been completed?	Is mill being operated in overloaded condition?	Is motor adequately ventilated?	Is the mill room temperature less than 95° F?	Are the belts tensioned correctly?			
Motor tripping overloads	Is electrical voltage correct?	Is motor wired correctly?	Has routine motor maintenance been completed?	Is mill being operated in overloaded condition?	Is motor adequately ventilated?	Is mill jammed?	Are the belts tensioned correctly?	Is the VFD limiting amps set correctly?		
Blast Gate Issues	Check									
Blast Gate will not fully open	Inspect to see if product is jammed in the slide	Is handwheel mechanism jammed?	Is handwheel broken, bent, or damaged in shipping?	Has handwheel become disengaged from slide gate?						
Blast Gate will not fully close	Inspect to see if product is jammed in the slide	Is handwheel mechanism jammed?	Is handwheel broken, bent, or damaged in shipping?	Has handwheel become disengaged from slide gate?						
Blast Gate is stuck in-between open and closed	Inspect to see if product is jammed in the guide ways	Is handwheel mechanism jammed?	Is handwheel broken, bent, or damaged in shipping?	Has handwheel become disengaged from slide gate?						
Handwheel mechanism spins freely but nothing moves	Mechanism is broken & needs to be replaced	Is actuator rod unthreaded from hand wheel?	Is internal actuator thread stripped or broken?							
Product Milling Issues	Check									
Ground particle size is inconsistent	Is the roll gap opening correct?	Is the roll gap the same on both sides - parallel?	Do the rolls need re-surfacing?	Is the spring tension correct?						
Whole particles are getting through	Is the roll gap opening correct?	Is the roll gap the same on both sides - parallel?	Do the rolls need re-surfacing?	Is the spring tension correct?	Are internal guards in place and not damaged?	Are the V-Guides worn?				
Throughput is not as expected	Does material being ground correspond to throughput?	Is roll gap set correctly for material being ground?	Is there any bridging in the feed hopper, upstream, or downstream?	Is there any ferrous debris on the feed hopper magnet?	Is the Blast Gate set correctly?	Is the mill being operated at FLA on ammeter?	Do the rolls need re-surfacing?	Is product moisture content too high?	Have all Electrical Issues listed above been ruled out?	
Mill is jammed with product	<div style="border: 2px solid red; padding: 5px;"> <p>NOTE! NEVER USE ANY TYPE OF WRENCH TO TURN THE ROLLS IN AN EFFORT TO UNJAM THE MILL. FAILURE TO COMPLY WILL DAMAGE THE EQUIPMENT AND WILL VOID THE WARRANTY. SEE INSTRUCTIONS IN SECTION 5 OF THE MANUAL TO CLEAR JAMS CORRECTLY</p> </div>									
Mill is jammed with foreign object										
Mechanical Issues	Check									
Mill is vibrating excessively	Is the mill mounted on a level surface?	Are all motor mounting bolts tightened?	Are all bolts in taper lock bushings tightened?	Are all mill mounting bolts to base plate tightened?	Are all feed hopper mounting bolts tightened?	Are all module mounting bolts tightened?	Are the belts tensioned correctly?	Is product moisture content too high?	Is there a foreign object in the mill?	Are the rolls running while in a "zeroed" condition?
Mill is making unusual noises	Are all motor and guard mounting bolts tightened?	Are all bolts in taper lock bushings tightened?	Are all belt pulleys aligned and spaced on shaft correctly?	Are all module cover plate mounting bolts tightened?	Are all discharge hopper mounting bolts tightened?	Has the interior of the mill been cleaned on schedule?	Are the belts tensioned correctly?	Are the internal guards bent or damaged?	Is there a foreign object in the mill?	Are the rolls running while in a "zeroed" condition?
Belts are squealing	Are the belts tensioned correctly?	Are the belts worn out & needing replaced?	Is there a foreign substance on the belt?	Is the belt pulley worn out and needing replaced?	Are all belt idlers tight and functioning properly?	Is the mill Jammed?	Is Blast Gate set correctly?			
Bearings are making noise	Have the bearings been greased on schedule?	Are the rolls severely out of alignment?	Are the belts tensioned correctly?	Have incompatible greases been mixed?						
Roll adjustment not working correctly	Has the exterior jam nut been loosened?	Is the threaded rod stripped or cross-threaded?	Has the bearing slide been greased on schedule?	Have incompatible greases been mixed?						



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ADDENDUM E

Motor Maintenance & Mill Motor Matrix

Mill Motor Matrix – Page 2

A listing of all of the motors used on Sasquatch Roller Mills, both Brewery & Distillery Duty. Listing includes Motor HP, Base RPM, and VFD Hz setting. All single phase and three phase national and international voltages are available.

Motor Maintenance – Page 3-10

The entire Marathon Motor Operation, Installation, and Maintenance Manual is included.

Drive Requirements ~ Distillery Duty

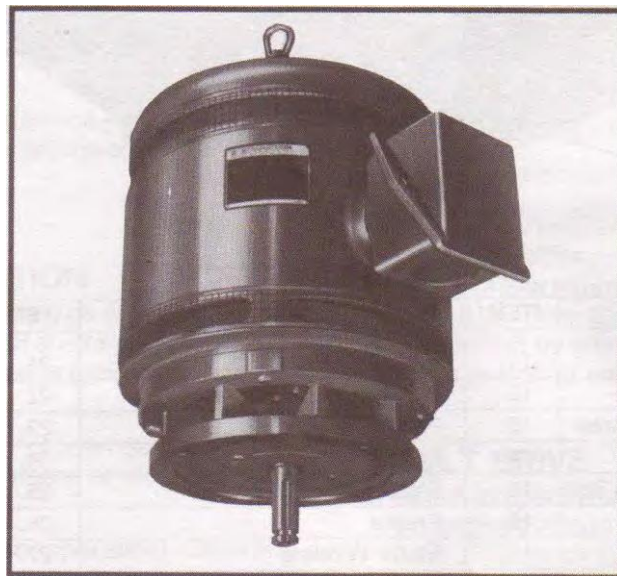
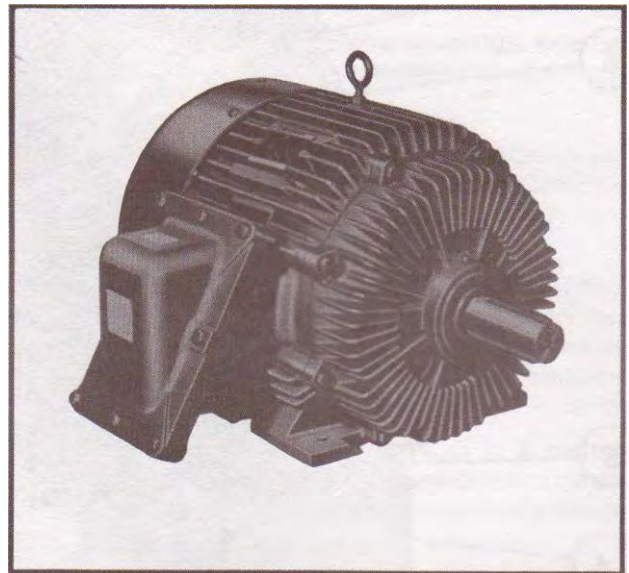
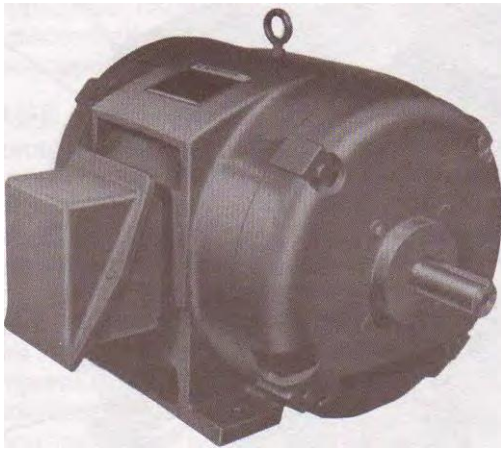
Mill	Base HP	VFD Hz	Base RPM
9062M-	3.0	60	1,200
9064M-	5.0	60	1,200
9066M-	7.5	42	1,750
9122M-	5.0	60	1,200
9124M-	10.0	42	1,750
9126M-	15.0	42	1,750
9182M-	7.5	42	1,750
9184M-	15.0	42	1,750
9186M-	25.0	42	1,750
9242M-	10.0	42	1,750
9244M-	20.0	42	1,750
9246M-	30.0	42	1,750

Drive Requirements ~ Brewery Duty

Mill	Base HP	VFD Hz	Base RPM
9062M-	3.0	60	1,200
9064M-	3.0	60	1,200
9066M-	7.5	42	1,750
9122M-	3.0	60	1,200
9124M-	7.5	42	1,750
9126M-	10.0	42	1,750
9182M-	7.5	42	1,750
9184M-	10.0	42	1,750
9186M-	15.0	42	1,750
9242M-	7.5	42	1,750
9244M-	15.0	42	1,750
9246M-	20.0	42	1,750

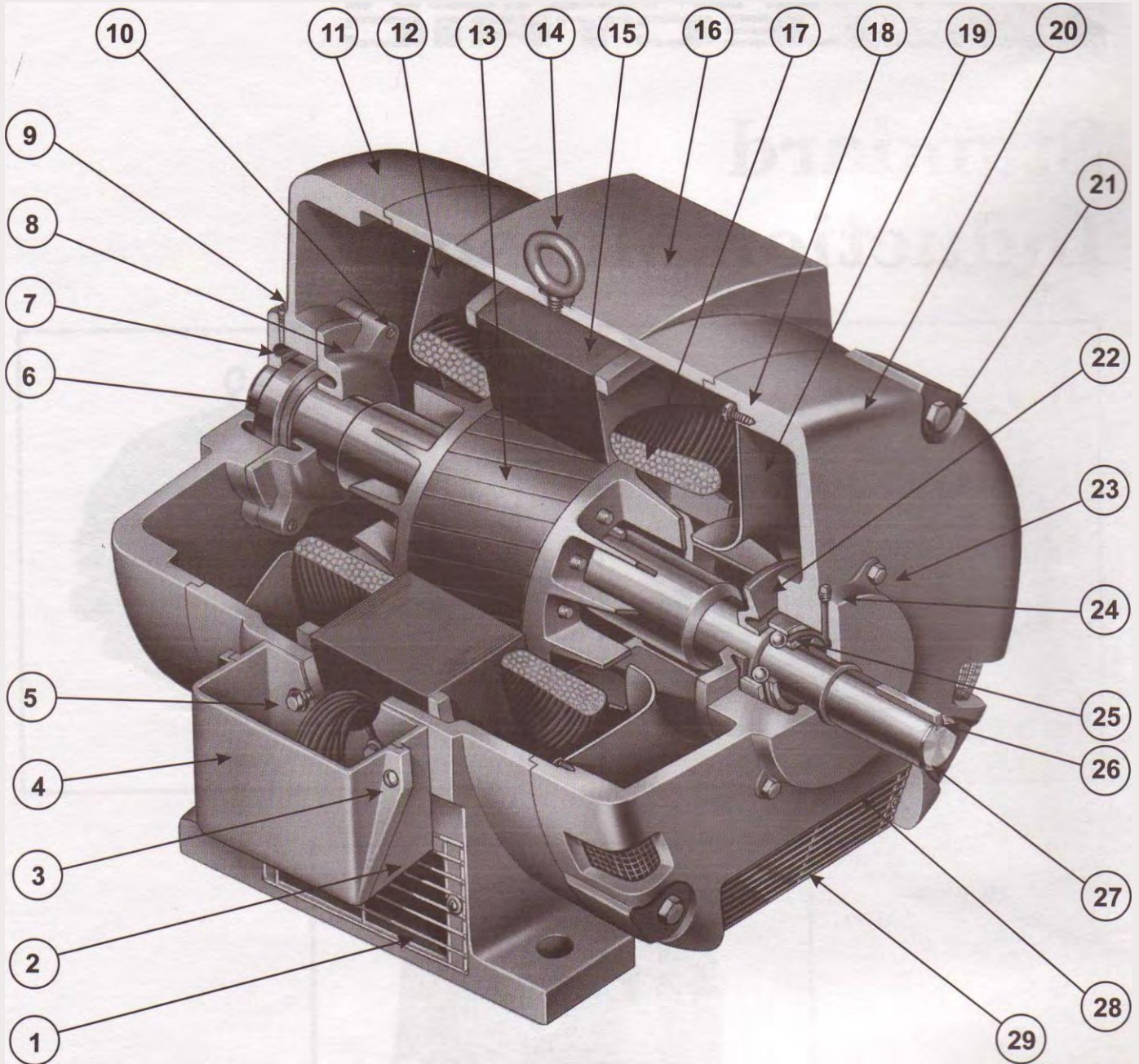
marathon[™]
Motors

Standard Induction Motors



Installation, Operation, & Maintenance Instructions

**TYPICAL CUTAWAY VIEW
OF A DRIPPROOF, HORIZONTAL
INTEGRAL HORSEPOWER MOTOR & PARTS DESCRIPTION
364 THRU 445 FRAME SIZE**



ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	**Frame Vent Screen	11.	Bracket O.P. E.	21.	Bracket Holding Bolt
2.	Conduit Box Bottom	12.	Baffle Plate O.P.E.	22.	Inner Bearing Cap P.E.
3.	Conduit Box Top-Holding Screw	13.	Rotor Core	23.	Inner Bearing Cap Bolt
4.	Conduit Box Top	14.	Lifting Eye Bolt	24.	Grease Plug
5.	Conduit Box Bottom-Holding Bolt	15.	Stator Core	25.	*Ball Bearing P.E.
6.	*Ball Bearing O.P.E.	16.	Frame	26.	Shaft Extension Key
7.	Pre-loading Spring	17.	Stator Winding	27.	Shaft
8.	Inner Bearing Cap O.P.E.	18.	Baffle Plate Holding Screw	28.	Drain Plug (grease)
9.	Grease Plug	19.	Baffle Plate P.E.	29.	**Bracket Screen
10.	Inner Bearing Cap Bolt	20.	Bracket P.E.		

P.E. = Pulley End

O.P.E. = Opposite Pulley End

* = Bearing Numbers are shown on motor nameplate when requesting information or parts always give complete motor description, model and serial numbers.

** = Bracket and frame screens are optional.

WARNING

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the motor. They should be brought to the attention of all persons who install, operate or maintain this equipment.

GENERAL INFORMATION

Motors are all fully factory tested and inspected before shipping. Damage during shipment and storage can occur. Motors not correctly matched to the power supply and/or the load will not operate properly. These instructions are intended as a guide to identify and eliminate these problems before they are overlooked or cause further damage.

ACCEPTANCE

Check carefully for any damage that may have occurred in transit. If any damage or shortage is discovered, do not accept until an appropriate notation on the freight bill is made. Any damage discovered after receipt of equipment should be immediately reported to the carrier.

STORAGE

- A. Keep motors clean
 1. Store indoors
 2. Keep covered to eliminate airborne dust and dirt.
 3. Cover openings for ventilation, conduit connections, etc. to prevent entry of rodents, snakes, birds, and insects, etc.
- B. Keep motors dry
 1. Store in a dry area indoors
 2. Temperature swings should be minimal to prevent condensation.
 3. Space heaters are recommended to prevent condensation.
 4. Treat unpainted flanges, shafts, and fittings with a rust inhibitor.
 5. Check insulation resistance before putting motor into service. (Consult manufacturer for guidelines).
- C. Keep Bearings Lubricated
 1. Once per month, rotate shaft several turns to distribute grease in bearings.
 2. If unit has been stored more than one year, add grease before start-up. (Refer to lubrication procedure).

INSTALLATION

UNCRATING AND INSPECTION

After uncrating, check for any damage which may have been incurred in handling. The motor shaft should turn freely by hand. Repair or replace any loose or broken parts before attempting to use the motor.

Check to be sure that motor has not been exposed to dirt, grit, or excessive moisture in shipment or storage before installation.

Measure insulation resistance (see operation). Clean and dry the windings as required.

Never start a motor which has been wet without having it thoroughly dried.

SAFETY

Motors should be installed, protected and fused in accordance with latest issue of National Electrical Code, NEMA Standard Publication No. MG 2 and local codes.

Eyebolts or lifting lugs are intended for lifting the motor only. These lifting provisions should never be used when lifting or handling the motor with other equipment (i.e. pumps, gear boxes, fans or other driven equipment) as a single unit. Be sure the eyebolt is fully threaded and tight in its mounting hole.

Eyebolt lifting capacity ratings is based on a lifting alignment coincident with the eyebolt centerline. Eyebolt capacity reduces as deviation from this alignment increases. See NEMA MG 2.

Frames and accessories of motors should be grounded in accordance with National Electrical Code (NEC) Article 430. For general information of grounding refer to NEC Article 250.

Rotating parts such as pulleys, couplings, external fans, and shaft extensions should be permanently guarded.

LOCATION

In selecting a location for the motor, consideration should be given to environment and ventilation. A motor with the proper enclosure for the expected operating condition should be selected.

The ambient temperature of the air surrounding the motor should not exceed 40c C (104°F) unless the motor has been especially designed for high ambient temperature applications. The free flow of air around the motor should not be obstructed.

The motor should never be placed in a room with a hazardous process, or where flammable gases or combustible material may be present, unless it is specifically designed for this type of service.

1. Drip-proof (open) motors are intended for use indoors where atmosphere is relatively clean, dry and non-corrosive.
2. Totally enclosed motors may be installed where dirt, moisture and corrosion are present, or in outdoor locations.
3. Explosion proof motors are built for use in hazardous locations as indicated by Underwriters' label on motor. Consult UL, NEC, and local codes for guidance.

Refer to manufacturer for application assistance.

FLOOR MOUNTING

Motors should be provided with a firm, rigid foundation, with the plane of four mounting pads flat within .010" for 56 to 210 frame; .015" from 250 through 500 frame. This may be accomplished by shims under the motor feet. For special isolation mounting, contact manufacturer for assistance.

V-BELT DRIVE

1. Select proper type and number of belts and sheaves. Excessive belt load will damage bearings. Sheaves should be in accordance to NEMA Spec. MG-1 or as approved by the manufacturer for a specific application.
2. Align sheaves carefully to avoid axial thrust on motor bearing. The drive sheave on the motor should be positioned toward the motor so it is as close as possible to the bearing.

- When adjusting belt tension, make sure the motor is secured by all mounting bolts before tightening belts.
- Adjust belt tension to belt manufacturer's recommendations. Excessive tension will decrease bearing life.
- For more information see Marathon Electric Publication SB528.

DIRECT CONNECTED DRIVE

Flexible or solid shaft couplings must be properly aligned for satisfactory operation. On flexible couplings, the clearance between the ends of the shafts should be in accordance with the coupling manufacturer's recommendations or NEMA standards for end play and limited travel in coupling.

MISALIGNMENT and RUN-OUT between direct connected shafts will cause increased bearing loads and vibration even when the connection is made by means of a flexible coupling. Excessive misalignment will decrease bearing life. Proper alignment, per the specifications of the coupling being used, is critical.

Some large motors are furnished with roller bearings. Roller bearings should **not** be used for direct drive.

ELECTRICAL CONNECTIONS

CAUTION

Install and ground per local and national codes. Consult qualified personnel with questions or if repairs are required.

WARNING

- Disconnect power before working on motor or driven equipment.
- Motors with automatic thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
- Motors with manual thermal protectors may start unexpectedly after protector trips. If manual protector trips, disconnect motor from power line. After protector cools (five minutes or more) it can be reset and power may be applied to motor.
- Discharge all capacitors before servicing motor.
- Always keep hands and clothing away from moving parts.
- Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, imbedded detector, or thermocouple.
- Electrical repairs should be performed by trained and qualified personnel only.
- Failure to follow instructions and safe electrical procedures could result in serious injury or death.
- If safety guards are required, be sure the guards are in use.

- All wiring, fusing, and grounding must comply with National Electrical Codes and local codes.
- To determine proper wiring, rotation and voltage connections, refer to the information and diagram on the nameplate, separate connection plate or decal. If the plate or decal has been removed, contact Marathon Electric for assistance.
- Use the proper size of line current protection and motor controls as required by the National Electrical Code and local codes. Recommended use is 125% of full load amps as shown on the nameplate for motors with 40°C ambient

and a service factor over 1.0. Recommended use is 115% of full load amps as shown on the nameplate for all other motors. Do not use protection with larger capacities than recommended. Three phase motors must have all three phases protected.

THERMAL PROTECTOR INFORMATION

The nameplate will indicate one of the following:

- Motor is thermally protected
- Motor is not thermally protected
- Motor is provided with overheat protective device

For examples, refer to paragraphs below:

- Motors equipped with built-in thermal protection have "THERMALLY PROTECTED" stamped on the nameplate. Thermal protectors open the motor circuit electrically when the motor overheats or is overloaded. The protector cannot be reset until the motor cools. If the protector is automatic, it will reset itself. If the protector is manual, press the red button to reset.
- Motors without thermal protection have nothing stamped on nameplate about thermal protection.
- Motors that are provided with overheat protective device that does not open the motor circuit directly will indicate "WITH OVERHEAT PROTECTIVE DEVICE".
 - Motors with this type of "Overheat Protective Device" have protector leads brought out in the motor conduit box marked "P1" and "P2". These leads are intended for connection in series with the stop button of the 3-wire pilot circuit for the magnetic starter which controls the motor. See Figure 1.
 - The circuit controlled by the above "Overheat Protective Device" must be limited to a maximum of 600 volts and 360 volt-amps.

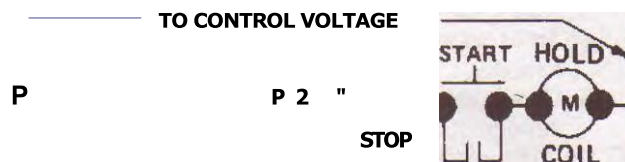


FIGURE 1

NORMALLY CLOSED PROTECTORS

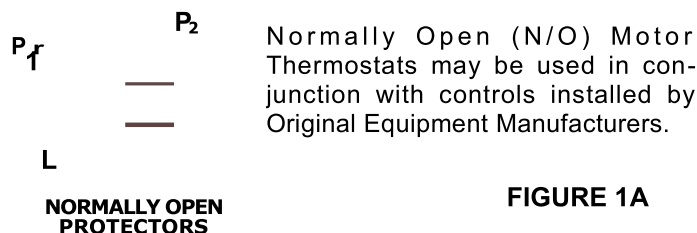


FIGURE 1A

CHANGING ROTATION

- Keep hands and clothing away from rotating parts.
- Before the motor is coupled to the load, determine proper rotation.
- Check rotation by jogging or bumping. Apply power to the motor leads for a short period of time, enough to just get motor shaft to rotate a slight amount to observe shaft rotating direction.
- Three phase - interchange any two (2) of the three (3) line leads. Single phase - reconnect per the connection diagram on the motor.

REDUCED VOLTAGE STARTING

Motors used on reduced voltage starting, should be carefully selected based upon power supply limitations and driven load requirements. The motors starting torque will be reduced when using reduced voltage starting. The elapsed time on the start step should be kept as short as possible and should not exceed 5 seconds. It is recommended that this time be limited to 2 seconds. Refer to Marathon Electric for application assistance.

OPERATION

WARNING

Disconnect and lock out before working on motor or driven equipment.

BEFORE INITIAL STARTING

1. If a motor has become damp in shipment or in storage, measure the insulation resistance of the stator winding.

$$\text{Minimum Insulation Resistance} = \frac{\text{Rated Voltage}}{1 + \frac{\text{In Megohms}}{1000}}$$

Do not attempt to run the motor if the insulation resistance is below this value.

2. If insulation resistance is low, dry out the moisture in one of the following ways:
 - a. Bake in oven at temperature not more than 90°C (194°F).
 - b. Enclose motor with canvas or similar covering, leaving a hole at the top for moisture to escape, and insert heating units or lamps.
 - c. Pass a current at low voltage (rotor locked) through the stator winding. Increase the current gradually until the winding temperature, measured with a thermometer, reaches 90°C (194°F). Do not exceed this temperature.
3. See that voltage and frequency stamped on motor and control nameplates correspond with that of the power line.
4. Check all connections to the motor and control with the wiring diagram.
5. Be sure rotor turns freely when disconnected from the load. Any foreign matter in the air gap should be removed.
6. Leave the motor disconnected from the load for the initial start (see following caution). Check for proper rotation. Check for correct voltage (within + 10% of nameplate value) and that it is balanced within 1% at the motor terminals. After the machine is coupled to the load, check that the nameplate amps are not exceeded. Recheck the voltage level and balance under load per the above guidelines. Shut down the motor if the above parameters are not met or if any other noise or vibration disturbances are present. Consult NEMA guidelines or the equipment manufacturer if any questions exist before operating equipment.

CAUTION

For motors nameplated as "belted duty only", do not run motor without belts properly installed.

COLLECTOR RINGS (Wound Rotor Motors Only)

The collector rings are sometimes treated at the factory to protect them while in stock and during shipment. The brushes have been fastened in a raised position. Before putting the motor into service, the collector rings should be cleaned to remove this treatment. Use a cleaning fluid that is made for degreasing electrical equipment. All of the brushes must be released and lowered to the collector surface. Keep the rings clean and maintain their polished surfaces. Ordinarily, the rings will require only occasional wiping with a piece of canvas or non-linting cloth. Do not let dust or dirt accumulate between the collector rings.

BRUSHES (Wound Rotor Motors Only)

See that the brushes move freely in the holders and at the same time make firm, even contact with the collector rings. The pressure should be between 2 and 3 pounds per square inch of brush surface.

When installing new brushes, fit them carefully to the collector rings. Be sure that the copper pigtail conductors are securely fastened to, and make good contact with, the brush holders.

ALLOWABLE VOLTAGE AND FREQUENCY RANGE

If voltage and frequency are within the following range, motors will operate, but with somewhat different characteristics than obtained with correct nameplate values.

1. Voltage: Within 1 0% above or below the value stamped on the nameplate. On three phase systems the voltage should be balanced within 1%. A small voltage unbalance will cause a significant current unbalance.
2. Frequency: Within 5% above or below the value stamped on the nameplate.
3. Voltage and Frequency together: Within 10% (providing frequency above is less than 5%) above or below values stamped on the nameplate.

CLEANLINESS

Keep both the interior and exterior of the motor free from dirt, water, oil and grease. Motors operating in dirty places should be periodically disassembled and thoroughly cleaned.

CONDENSATION DRAIN PLUGS

All explosion proof and some totally enclosed motors are equipped with automatic drain plugs, they should be free of oil, grease, paint, grit and dirt so they don't clog up. The drain system is designed for normal floor (feet down) mounting. For other mounting positions, modification of the drain system may be required, consult Marathon Electric.

SERVICE

WARNING

Disconnect power before working on motor or driven equipment. Motors with automatic thermal protectors will automatically restart when the protector cools. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.

CAUTION

Overgreasing bearings can cause premature bearing and/or motor failure. The amount of grease added should be carefully controlled.

NOTE

If lubrication instructions are shown on the motor nameplate, they will supersede this general instruction.

Motors are pregreased with polyurea mineral oil NGLI grade 2 type grease unless stated otherwise on the motor nameplate. Some compatible brands of polyurea mineral base type grease are: Chevron SRI #2, Rykon Premium #2, Exxon Polyrex EM or Texaco Polystar RB.

Motors are properly lubricated at the time of manufacture. It is not necessary to lubricate at the time of installation unless the motor has been in storage for a period of 12 months or longer (refer to lubrication procedure that follows).

LUBRICATION PROCEDURES

1. Stop motor. Disconnect and lock out of service.
2. Remove contaminants from grease inlet area.
3. Remove filler and drain plugs.
4. Check filler and drain holes for blockage and clean as necessary.
5. Add proper type and amount of grease. See the Relubrication Time Intervals table for service schedule and Relubrication Amounts table for volume of grease required.
6. Wipe off excess grease and replace filler and drain plugs (see following warning).
7. Motor is ready for operation.

WARNING

If motor is nameplated for hazardous locations, do not run motor without all of the grease or drain plugs installed.

RELUBRICATION TIME INTERVAL AND AMOUNTS

(For motors with regreasing provisions)

Service Condition	NEMA FRAME SIZE					
	140-180		210-360		400-510	
	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM
Standard	3 yrs.	6 months	2 yrs.	6 months	1 yr.	3 months
Severe	1 yr.	3 months	1 yr.	3 months	6 months	1 month
Seasonal	See Note 2.					

NOTE

1. For motors nameplated as "belted duty only" divide the above intervals by 3.
2. Lubricate at the beginning of the season. Then follow service schedule above.

SEASONAL SERVICE: The motor remains idle for a period of 6 months or more.

STANDARD SERVICE: Up to 16 hours of operation per day, indoors, 100°F maximum ambient.

SEVERE SERVICE: Greater than 16 hours of operation per day. Continuous operation under high ambient temperatures (100° to 150°F) and/or any of the following: dirty, moist locations, high vibration (above NEMA standards), heavy shock loading, or where shaft extension end is hot.

RELUBRICATION AMOUNTS

(For motors with regreasing provisions)

NEMA FRAME SIZE	VOLUME cu. in. (fluid oz.)	
140	.25	(.14)
180	.50	(.28)
210	.75	(.42)
250	1.00	(.55)
280	1.25	(.69)
320	1.50	(.83)
360	1.75	(.97)
400	2.25	(1.2)
440	2.75	(1.5)
500	3.00	(1.7)

TROUBLESHOOTING

WARNING

1. Disconnect power before working on motor or driven equipment.
2. Motors with automatic thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
3. Motors with manual thermal protectors may start unexpectedly after protector trips. If manual protector trips, disconnect motor from power line. After protector cools (five minutes or more) it can be reset and power may be applied to motor.
4. Discharge all capacitors before servicing motor.
5. Always keep hands and clothing away from moving parts.
6. Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, imbedded detector, or thermocouple.
7. Electrical repairs should be performed by trained and qualified personnel only.
8. Failure to follow instructions and safe electrical procedures could result in serious injury or death.
9. If safety guards are required, be sure the guards are in use.

If trouble is experienced in the operation of the motor, make sure that:

1. The bearings are in good condition and operating properly.
 2. There is no mechanical obstruction to prevent rotation in the motor or in the driven load.
 3. The air gap is uniform. (Consult manufacturer for specifications).
 4. All bolts and nuts are tightened securely.
 5. Proper connection to drive machine or load has been made.
- In checking for electrical troubles, be sure that:
1. The line voltage and frequency correspond to the voltage and frequency stamped on the nameplate of the motor.
 2. The voltage is actually available at motor terminals.
 3. The fuses and other protective devices are in proper condition.
 4. All connections and contacts are properly made in the circuits between the control apparatus and motor.

These instructions do not cover all details or variations in equipment nor provide for every possible condition to be met in connection with installation, operation or maintenance. Should additional information be desired for the purchaser's purposes, the matter should be referred to the manufacturer.

MOTOR TROUBLE SHOOTING CHART

Your motor service and any trouble shooting must be handled by qualified persons who have proper tools and equipment.

TROUBLE	CAUSE	WHAT TO DO
Motor fails to start	Blown fuses	Replace fuses with proper type and rating
	Overload trips	Check and reset overload in starter.
	Improper power supply	Check to see that power supplied agrees with motor nameplate and load factor.
	Improper line connections	Check connections with diagram supplied with motor.
	Open circuit in winding or control switch	Indicated by humming sound when switch is closed. Check for loose wiring connections. Also see that all control contacts are closing.
	Mechanical failure	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator	Indicated by blown fuses. Motor must be rewound.
	Poor stator coil connection	Remove end bells, locate with test lamp.
	Rotor defective	Look for broken bars or end rings.
Motor may be overloaded	Reduce load.	
Motor stalls	One phase may be open	Check lines for open phase.
	Wrong application	Change type or size. Consult manufacturer.
	Overload	Reduce load.
	Low voltage	See that nameplate voltage is maintained. Check connection.
	Open circuit	Fuses blown, check overload relay. stator and pushbuttons.
Motor runs and then dies down	Power failure	Check for loose connections to line, to fuses and to control.
Motor does not come up to speed	Not applied properly	Consult supplier for proper type.
	Voltage too low at motor terminals because of line drop.	Use higher voltage on transformer terminals or reduce load. Check connections. Check conductors for proper size.
	Starting load too high	Check load motor is supposed to carry at start.
	Broken rotor bars or loose rotor	Look for cracks near the rings. A new rotor may be required as repairs are usually temporary.
	Open primary circuit	Locate fault with testing device and repair.
Motor takes too long to accelerate and/or draws high amp	Excessive load	Reduce load.
	Low voltage during start	Check for high resistance. Adequate wire size.
	Defective squirrel cage rotor	Replace with new rotor.
	Applied voltage too low	Get power company to increase power tap.
Wrong rotation	Wrong sequence of phases	Reverse connections at motor or at switchboard.
Motor overheats while running under load	Overload	Reduce load.
	Frame or bracket vents may be clogged with dirt and prevent proper ventilation of motor.	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open	Check to make sure that all leads are well connected.
	Grounded coil	Locate and repair.
	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
Motor vibrates	Motor misaligned	Realign.
	Weak support	Strengthen base
	Coupling out of balance	Balance coupling.
	Driven equipment unbalanced	Rebalance driven equipment.
	Defective bearings	Replace bearing.
	Bearings not in line	Line up properly.
	Balancing weights shifted	Rebalance motor.
	Polyphase motor running single phase	Check for open circuit.
Excessive end play	Adjust bearing or add shim.	
Unbalanced line current on polyphase motors during normal operation	Unequal terminal volts	Check leads and connections.
	Single phase operation	Check for open contacts.
	Unbalanced voltage	Correct unbalanced power supply.
Scraping noise	Fan rubbing air shield	Remove interference.
	Fan striking insulation	Clear fan.
	Loose on bedplate	Tighten holding bolts.
Noisy operation	Airgap not uniform	Check and correct bracket fits or bearing.
	Rotor unbalance	Rebalance.
Hot bearings general	Bent or sprung shaft	Straighten or replace shaft.
	Excessive belt pull	Decrease belt tension.
	Pulleys too far away	Move pulley closer to motor bearing.
	Pulley diameter too small.	Use larger pulleys.
	Misalignment	Correct by realignment of drive.
Hot bearings ball	Insufficient grease	Maintain proper quantity of grease in bearing.
	Deterioration of grease or lubricant contaminated	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant	Reduce quantity of grease, bearing should not be more than 1/2 filled.
	Overloaded bearing	Check alignment, side and end thrust.
	Broken ball or rough races	Replace bearing, first clean housing thoroughly.



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ADDENDUM F

Spare Parts List

9060M & 9120M Mill Spare Parts List – Page 2

A comprehensive listing is provided of the spare parts that may be needed to maintain your 6” wide or 12” wide Sasquatch Roller Mill in top condition. Some are available individually and some are available only in kit-form. A list of recommended spares to keep in inventory is also provided.

9180M & 9240M Mill Spare Parts List – Page 3

A comprehensive listing is provided of the spare parts that may be needed to maintain your 18” wide or 24” wide Sasquatch Roller Mill in top condition. Some are available individually and some are available only in kit-form. A list of recommended spares to keep in inventory is also provided.

Detailed 3D view of Roll Adjuster Kit with part callouts – Page 4

Detailed 3D view of Rotary Actuator Kit with part callouts – Page 5

Detailed 3D view of other spare parts – Page 6 thru 11

Spare Parts List - 9060M & 9120M

Item	Description	Part Number	Kit Qty Req'd
1	6" Roll Adjustment Hand Wheel Dial	9000M-1185	1
2	6" Position Dial	9000M-1185-D	1
3	12" Roll Adjustment Hand Wheel Dial	9000M-1123	1
4	12" Position Dial	9000M-1123-D	1
5	Grind Roll Bearing Assy	70891	1
6	Grind Roll Bearing Cartridge - Front	9000M-1178	1
7	Grind Roll Bearing Cartridge - Rear	9000M-1179	1
8	Grind Roll	9240M-1100	2
9	Roll Adjustment Polyurethane Spring	10504-05855	1
10	Roll Adjustment Thrust Bearing Cartridge	(1)5909K31 + (2)5909K44	1
11	Roll Adjustment Threaded Rod	47476	1
12	Roll Adjustment Lock Nut	10504-05716	1
13	Roll Adjustment Jam Nut	0169686	4
14	Roll Adjustment Outer Mount	9000M-1120	1
15	Roll Adjustment Inner Mount	9000M-1117	1
16	Drive V-Belt Pulley	2B6.4-SDS 2.13"	1
17	Drive V-Belt Pulley	2B7.0-SK 2.13"	1
18	Drive V-Belt Pulley	2B4.2 SDS 1 3/8"	1
19	Cascade Pulley	2B70 SK 1 15/16"	2
20	Cascade Pulley	2B74 SK 1 15/16"	2
21	Drive V-Belt	BB77	1
22	Cascade V-Belt	X5 BX50	2
23	Idler Pulley Assy	9000M-1226	1
24	Cascade Idler Assy	9000M-1220	2
25	Cascade Idler Mount	SE-F 18	2
26	Rotary Actuator Outer Housing	9000M-2870	1
27	Rotary Actuator Inner Housing	9000M-2872	1
28	Rotary Actuator Push Rod	9000M-2871	1
29	Rotary Actuator Bronze Bushing	6391K119	2
30	Rotary Actuator Snap Ring	97633A300	1
31	Rotary Actuator Hand Wheel	6033K73	1
32	Rotary Actuator Snap Ring	91580A246	1
33	Rotary Actuator Jam nut	91078A240	1
34	Rotary Actuator Ball Bearing	6383K57 (R16)	2
35	6" Feed Hopper Magnet Screen	9060M-3010	1
36	12" Feed Hopper Magnet Screen	9120M-3010	1
37	6" Feed Hopper Magnet	10504-05734	1
38	12" Feed Hopper Magnet	10504-05735	1

It is recommended that these spare parts be inventoried at your facility

Roll Adjustment Kit - Available in kit-form only

Rotary Actuator Kit - Available in kit-form only

Items available individually as needed

Spare Parts List - 9180M & 9240M

Item	Description	Part Number	Kit Qty Req'd
1	12" Roll Adjustment Hand Wheel Dial	9000M-1123	1
2	12" Position Dial	9000M-1123-D	1
3	Grind Roll Bearing Assy	70891	2
4	Grind Roll Bearing Cartridge - Front	9000M-1178	1
5	Grind Roll Bearing Cartridge - Rear	9000M-1179	1
6	Grind Roll	9240M-1100	2
7	Roll Adjustment Polyurethane Spring	10504-05855	1
8	Roll Adjustment Thrust Bearing Cartridge	(1)5909K31 + (2)5909K44	1
9	Roll Adjustment Threaded Rod	47476	1
10	Roll Adjustment Lock Nut	10504-05716	1
11	Roll Adjustment Jam Nut	0169686	4
12	Roll Adjustment Outer Mount	9000M-1120	1
13	Roll Adjustment Inner Mount	9000M-1117	1
14	Drive Gear Belt Pulley	P64 8M50 2517 x 2.13"	1
15	Drive Gear Belt Pulley	P72 8M50 2517 x 2.13"	1
16	Drive Pulley	P40 8M50 2012 x 1.38"	1
17	Cascade Pulley	2B70 SK 1 15/16"	2
18	Cascade Pulley	2B74 SK 1 15/16"	2
19	Drive Belt	D2000 8M50	1
20	Cascade V-belt	X5 BX50	2
21	Idler Pulley Assy	9000M-1226	1
22	Cascade Idler Asy	9000M-1220	2
23	Cascade Idler Mount	SE-F 18	2
24	Rotary Actuator Outer Housing	9000M-2870	1
25	Rotary Actuator Inner Housing	9000M-2872	1
26	Rotary Actuator Push Rod	9000M-2871	1
27	Rotary Actuator Bronze Bushing	6391K119	2
28	Rotary Actuator Snap Ring	97633A300	1
29	Rotary Actuator Hand Wheel	6033K73	1
30	Rotary Actuator Snap Ring	91580A246	1
31	Rotary Actuator Jam nut	91078A240	1
32	Rotary Actuator Ball Bearing	6383K57 (R16)	2
33	18" Feed Hopper Magnet Screen	9180M-3010	1
34	24" Feed Hopper Magnet Screen	9240M-3010	1
35	18" Feed Hopper Magnet	10504-05736	1
36	24" Feed Hopper Magnet	10504-05737	1

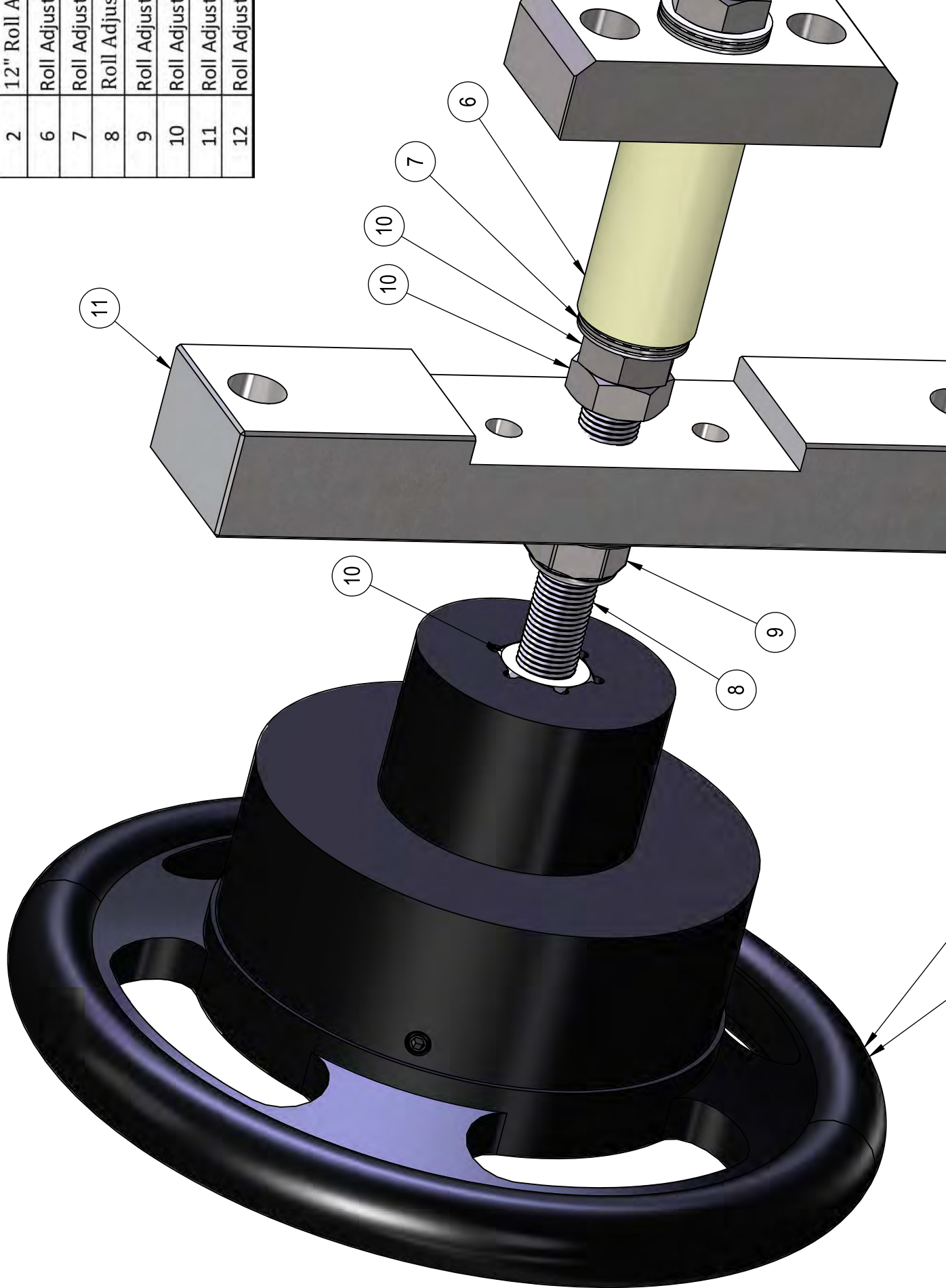
It is recommended that these spare parts be inventoried at your facility

Roll Adjustment Kit - Available in kit-form only

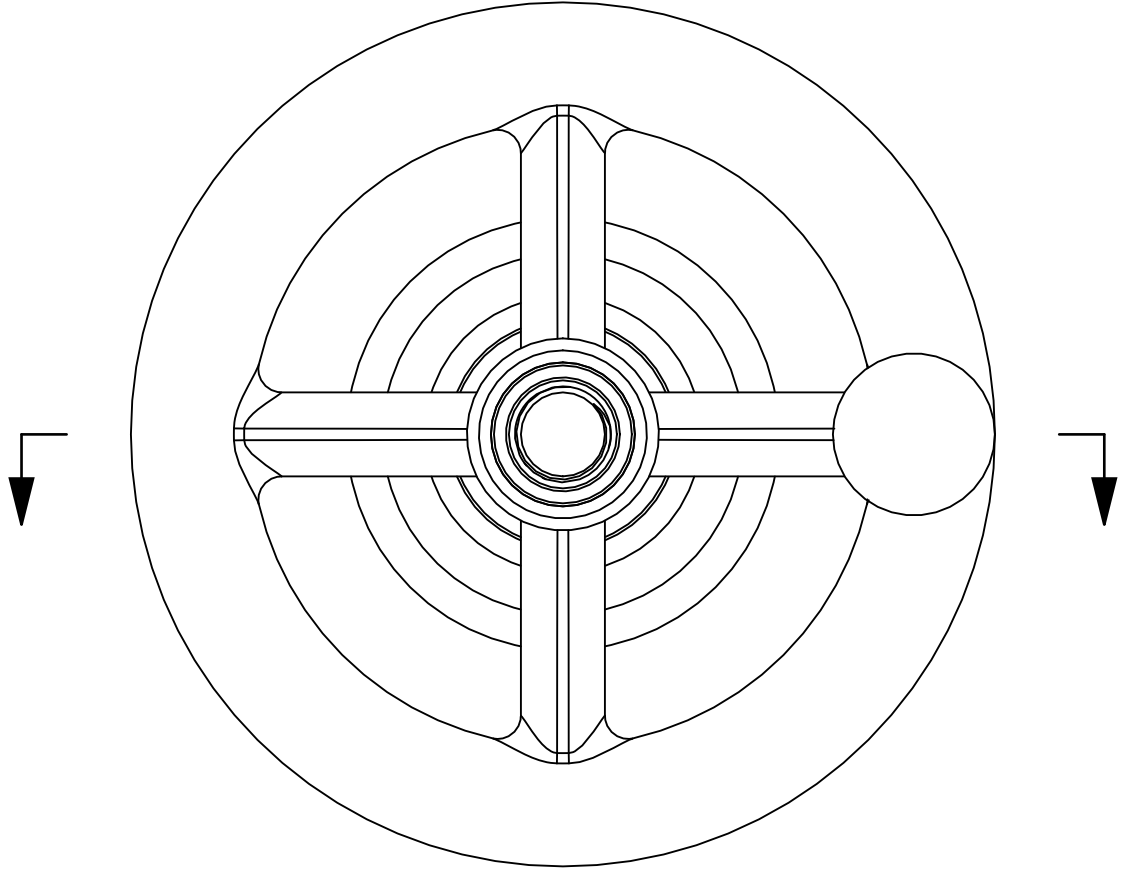
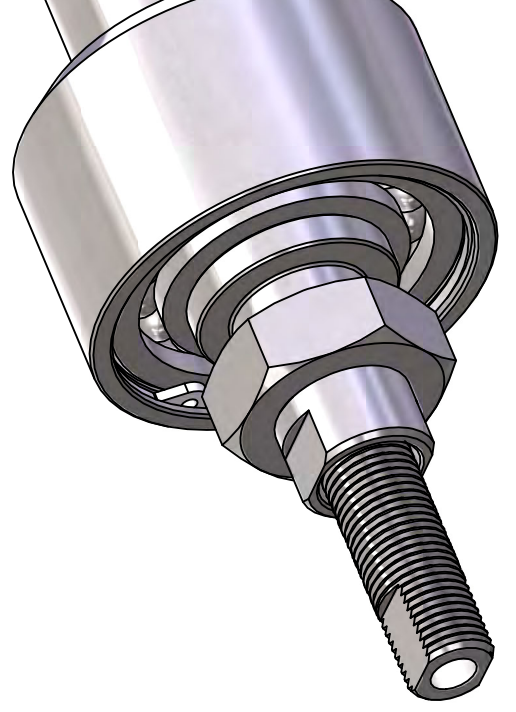
Rotary Actuator Kit - Available in kit-form only

Items available individually as needed

Item	Description
1	6" Roll Ad
2	12" Roll A
6	Roll Adjust
7	Roll Adjust
8	Roll Adjust
9	Roll Adjust
10	Roll Adjust
11	Roll Adjust
12	Roll Adjust

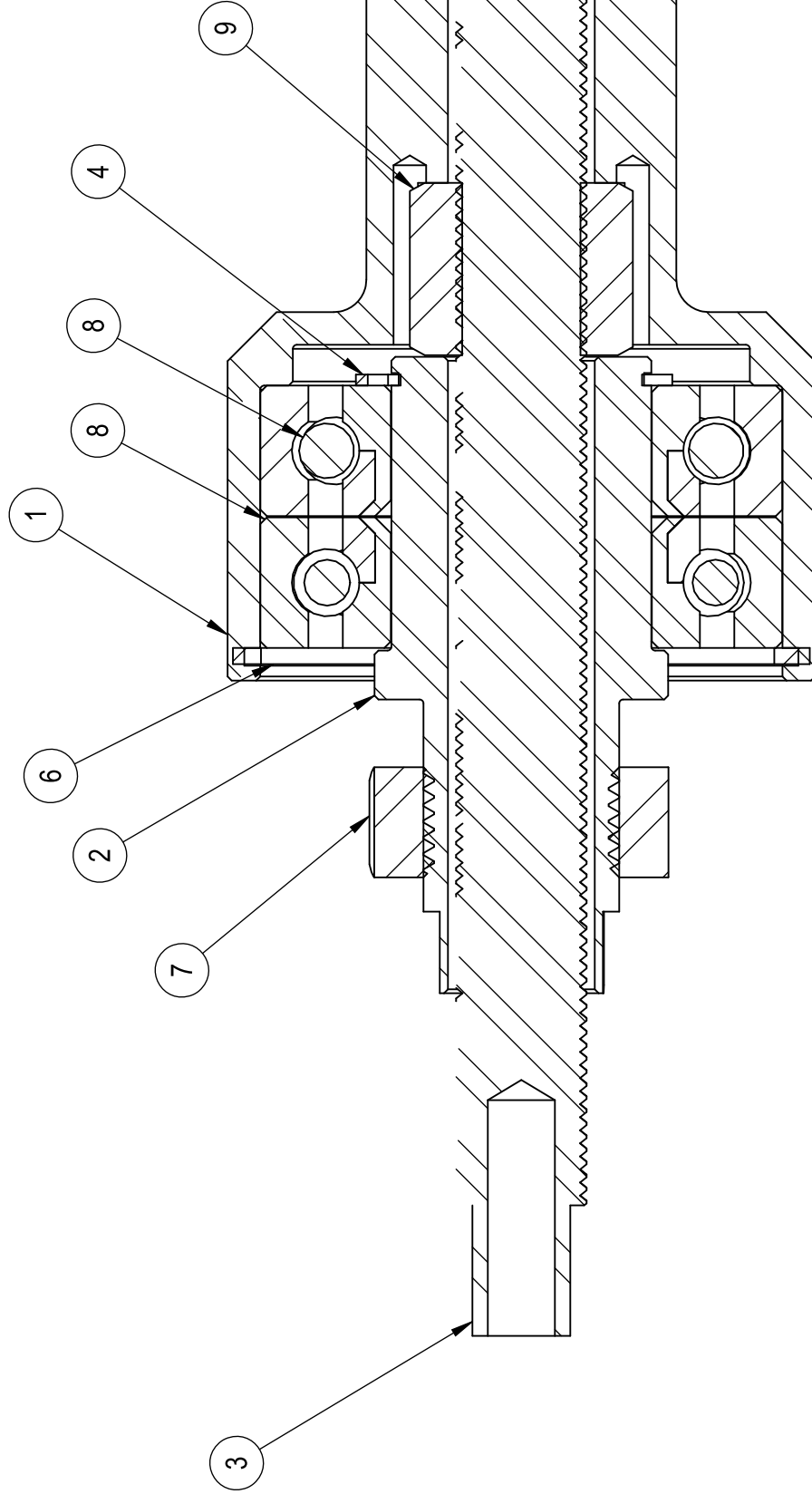


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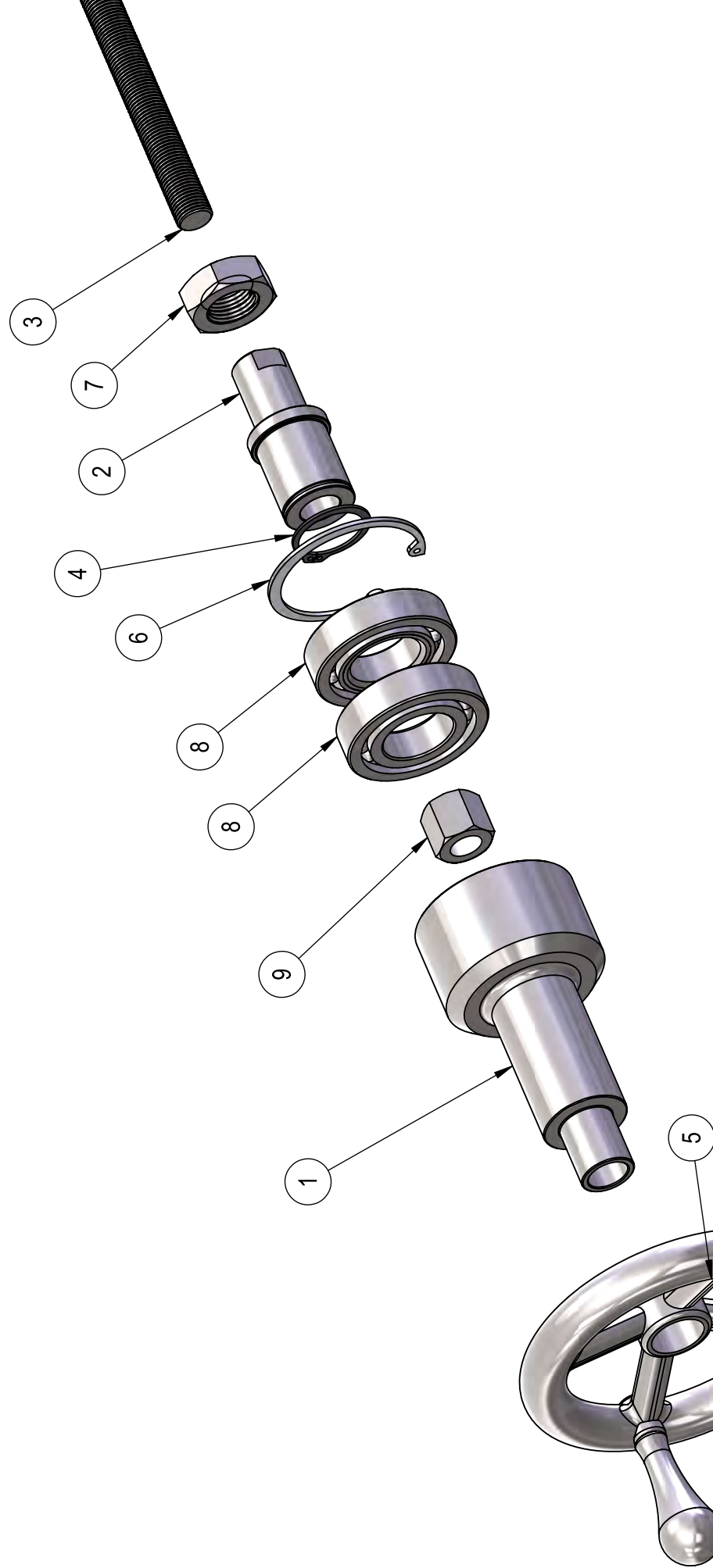
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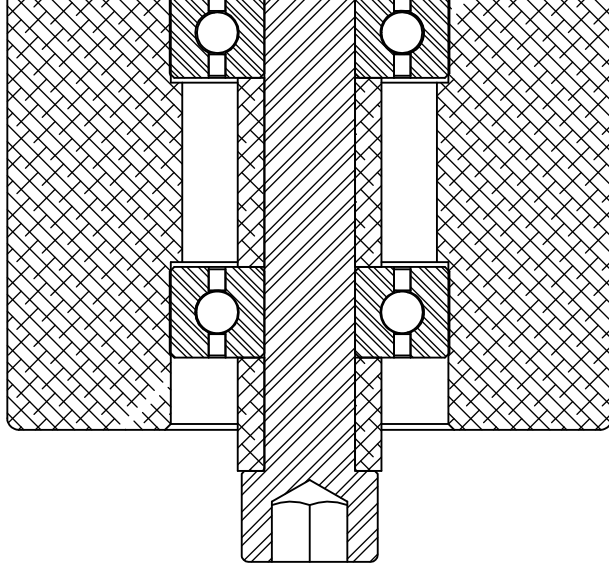
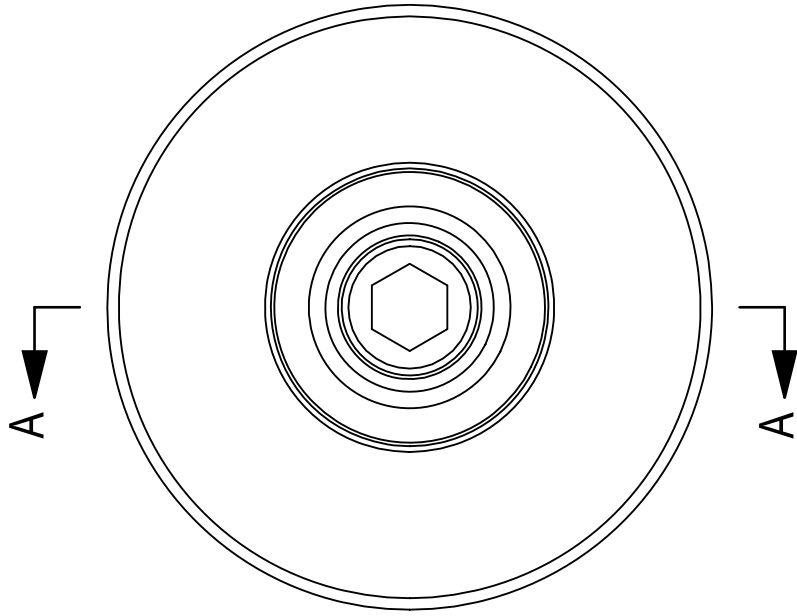


ITEM	PART NO.	DESCRIPTION	DIM	FAB	QTY
1	9000M-2870	BAR - Ø2.25"	4.44"	DWG	1

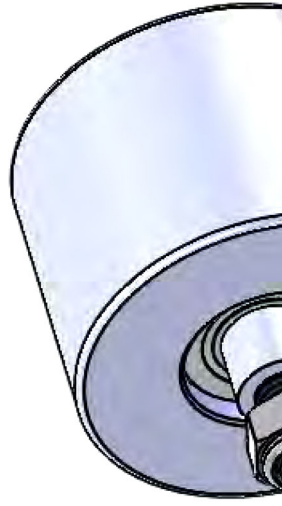
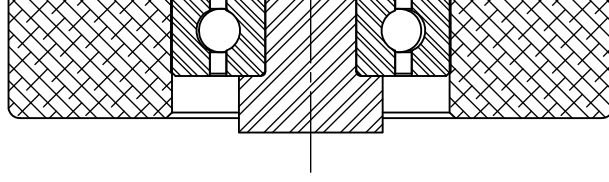
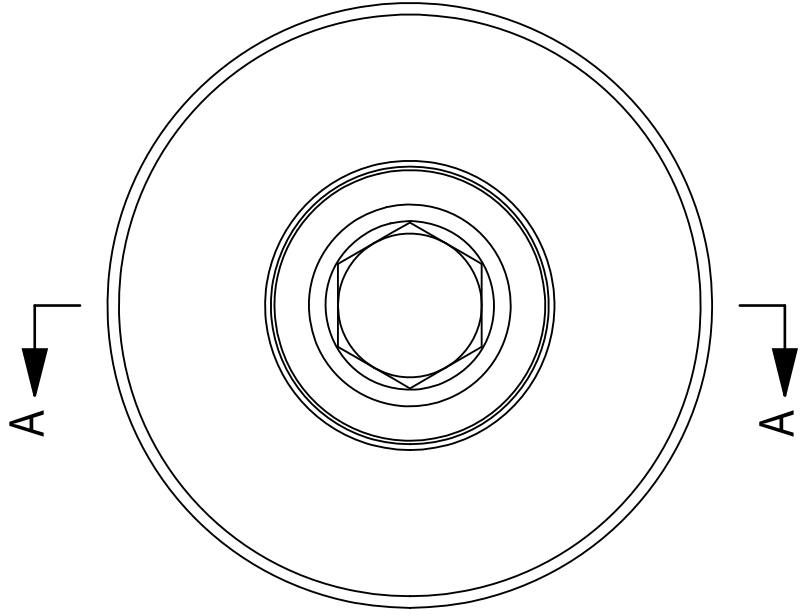
PART NUMBER



PART NUMBER
9000M-1226



PART NUMBER
9000M-1220



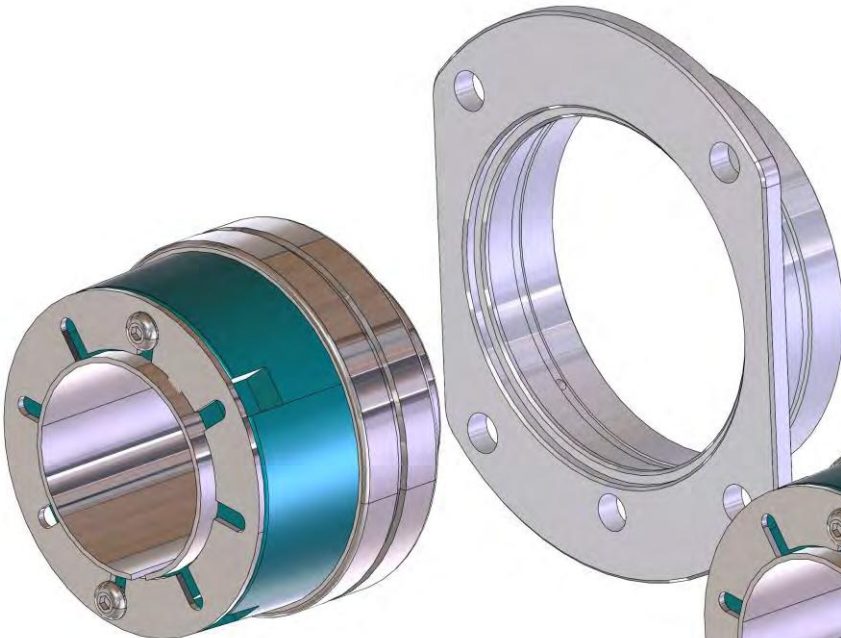


9000M-1123 Large Handwheel
9000M-1123-D Position Dial



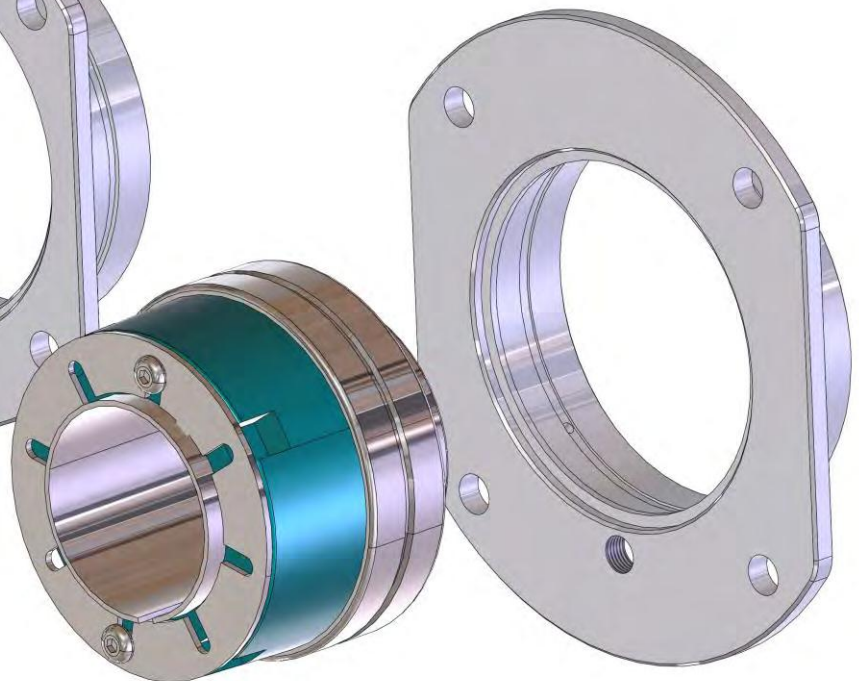
9000M-1185 Small Handwheel
9000M-1185-D Position Dial

9000M-1178 Cartridge

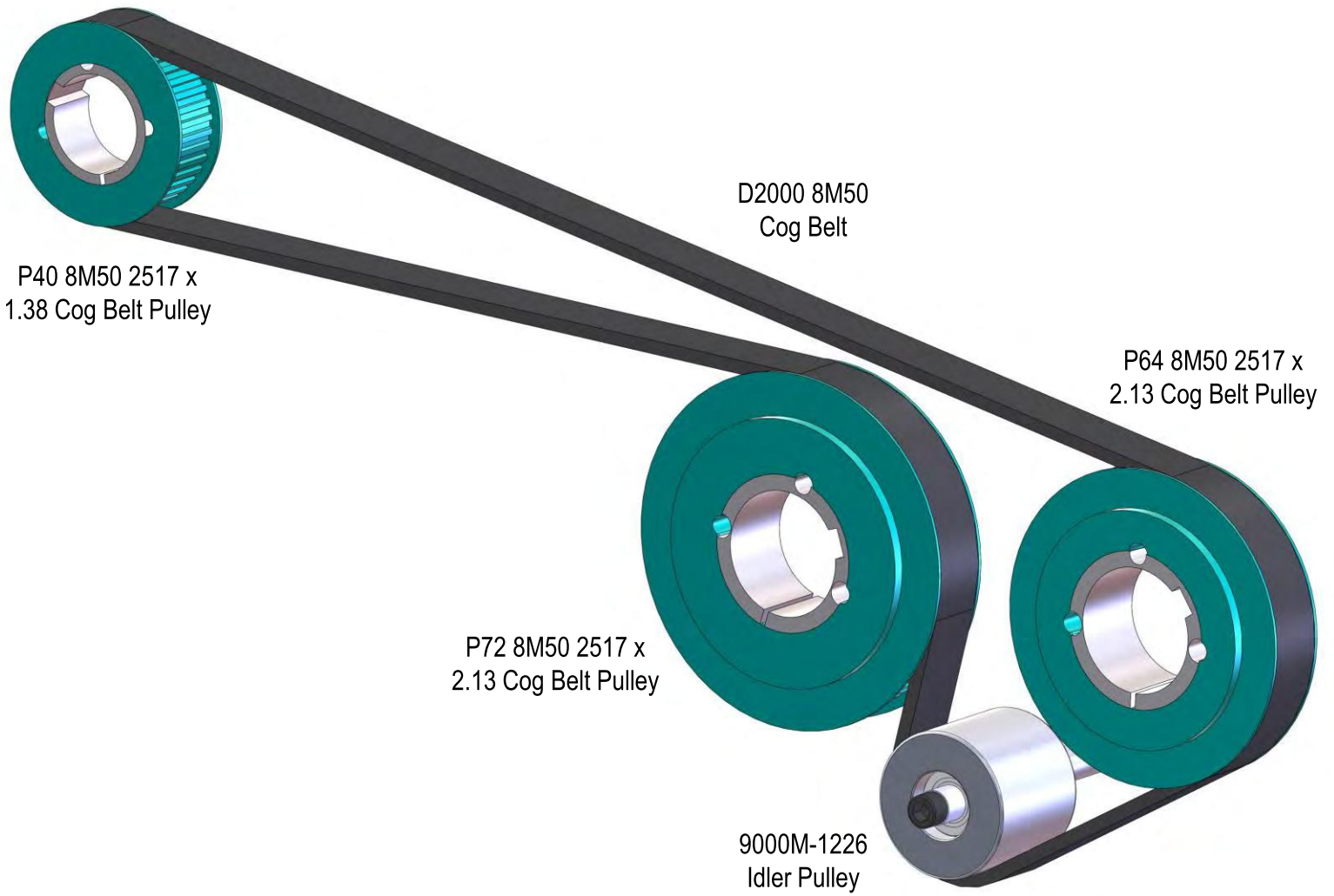


INS-IP-200R Bearing

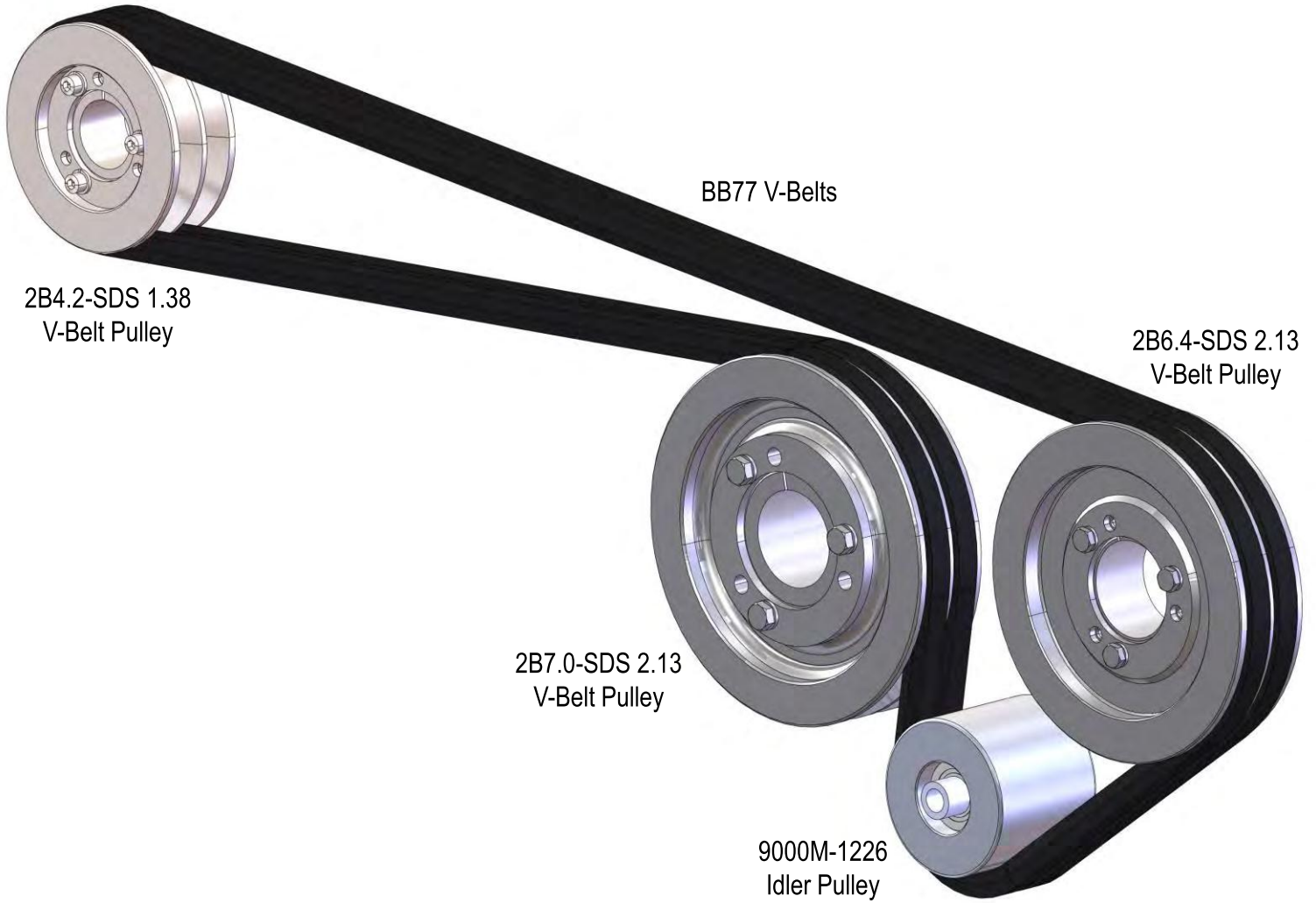
9000M-1179 Cartridge



INS-IP-200R Bearing



9180M & 9240M Drive Components



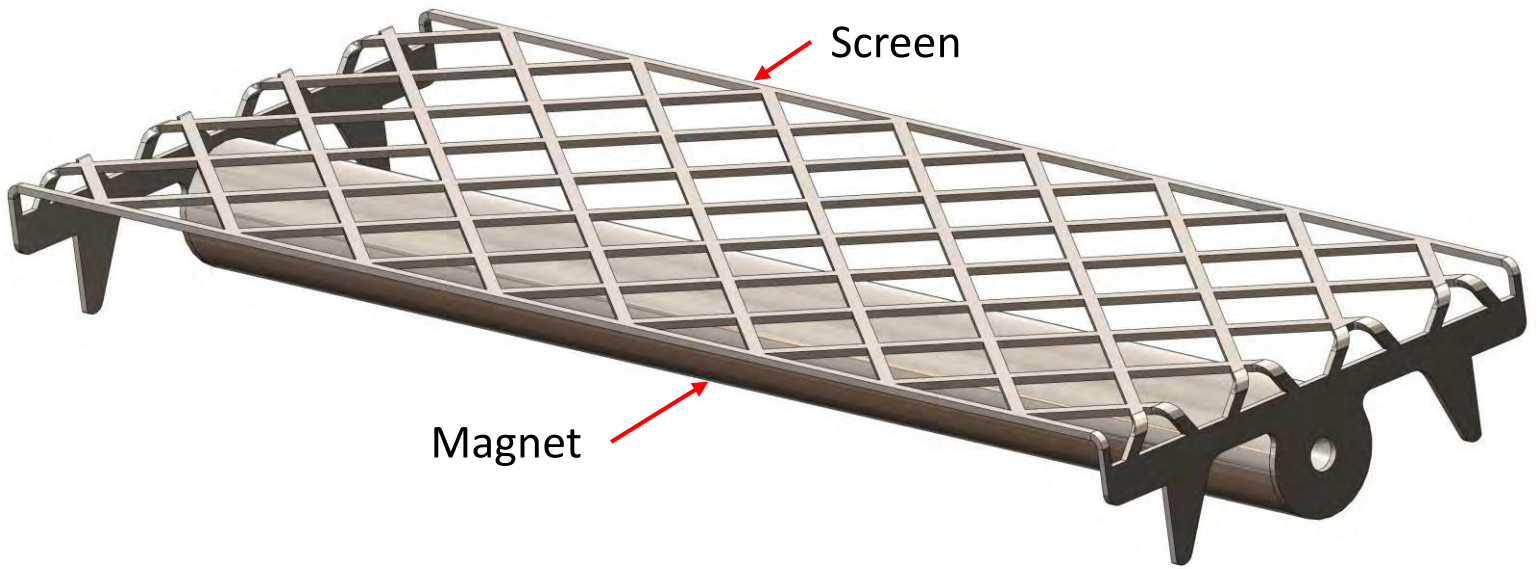
9060M & 9120M Drive Components

2B7.0-SDS 2.13
V-Belt Pulley

2B7.0-SDS 2.13
V-Belt Pulley



Cascade Belt Drive Components



Screen & Magnet Spare Parts		
Mill Model	Screen P/N	Magnet P/N
9060M	9060M-1030	10504-05734
9120M	9120M-1030	10504-05735
9180M	9180M-1030	10504-05736
9240M	9240M-1030	10504-05737



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ADDENDUM G

Mill Throughput & Increasing Capacity By Adding Grinding Modules

Mill throughput is a measure of mill performance, usually expressed as processed weight per unit of time, and is determined by several factors. Your Sasquatch Roller Mill is designed to provide years of trouble-free service if it is maintained properly and operated within the guidelines as set forth in the Owner's Manual.

Mill throughput is determined by the following four factors.

Size of the Mill

Sasquatch Roller Mills come in four different sizes which are denoted by the width of the grind rolls. Those sizes are 6", 12", 18", and 24". In addition to the roll width, the mills have stackable grind modules and come in either 2-roll, 4-roll, or 6-roll configurations. Mill throughput increases as the roll width increases and also as the number of rolls increase. Since Sasquatch Roller Mills are modular, they allow for the addition of entire roll sets even after the mill is in-place which allows for graduated expansion of capacity as your needs increase.

Health of the Mill

As the mill begins to wear over time, mill throughput can decline noticeably which may indicate that certain components are in need of being serviced, refurbished, or replaced. Instituting a consistent preventative maintenance program will help assure that your mill stays at the peak of its capabilities. When belts are not tensioned properly, or bearings and slides are not greased regularly the performance of the mill can be greatly affected.

Inbound and Outbound Conveyance Systems

Another important factor to mill throughput are the systems in place that puts product into the mill and takes it away after it is processed. If either of these systems is not sized correctly a diminished capacity may result. They need to be sized in accordance to the published mill throughput capacity and cleaned and maintained on a regular basis.

Product Being Processed

The product being processed, and its physical characteristics, is the main factor in determining the throughput of the mill. That's why Sasquatch Roller Mills publish throughput values for both Brewery Duty and Distillery Duty mills. And even though Distillery Duty has larger motors for any particular size of mill, the throughput is less because the product being processed is much harder to grind. Physical characteristics such as moisture content, shell hardness, kernel size, and average kernel weight greatly affect mill throughput.



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Stackable Modularity

Sasquatch Roller Mills are modular which affords great flexibility. Not only can optional functionality modules, such as a Weigh Module or a Feed Conveyor Module be added, but additional grinding modules can also be included. That means that if your initial capacity requirements lead you to use a 2-roll mill, when your business grows and you need to add more capacity, that same mill can be upgraded to a 4-roll or 6-roll mill by adding grinding modules and the associated higher HP motor. The charts below clearly indicate how this can be done and the resultant increase in throughput.

Brewery Duty Throughput				
2-Roll Base Mill				
Mill Model	No. of Rolls	Roll Width	Motor HP	Throughput lbs/hr
9062M	2	6.00"	2.0	2,500 - 3,000
9122M	2	12.00"	3.0	5,000 - 6,000
9182M	2	18.00"	7.5	7,500 - 8,500
9242M	2	24.00"	7.5	10,000 - 11,000

Distillery Duty Throughput				
2-Roll Base Mill				
Mill Model	No. of Rolls	Roll Width	Motor HP	Throughput lbs/hr
9062M	2	6.00"	3.0	1,000 - 1,500
9122M	2	12.00"	5.0	2,000 - 3,000
9182M	2	18.00"	7.5	5,000 - 6,000
9242M	2	24.00"	10.0	8,000 - 9,000

Add 1 Module & Increase Motor HP				
Mill Model	No. of Rolls	Roll Width	Motor HP	Throughput lbs/hr
9064M	4	6.00"	3.0	3,500 - 4,000
9124M	4	12.00"	7.5	6,000 - 7,000
9184M	4	18.00"	10.0	8,500 - 9,500
9244M	4	24.00"	15.0	11,000 - 12,000

Add 1 Module & Increase Motor HP				
Mill Model	No. of Rolls	Roll Width	Motor HP	Throughput lbs/hr
9064M	4	6.00"	5.0	1,500 - 2,000
9124M	4	12.00"	10.0	3,000 - 4,000
9184M	4	18.00"	15.0	6,000 - 7,000
9244M	4	24.00"	20.0	9,000 - 10,000

Add 2 Modules & Increase Motor HP				
Mill Model	No. of Rolls	Roll Width	Motor HP	Throughput lbs/hr
9066M	6	6.00"	7.5	4,500 - 5,000
9126M	6	12.00"	10.0	7,000 - 7,500
9186M	6	18.00"	15.0	9,500 - 10,000
9246M	6	24.00"	20.0	12,000 - 13,000

Add 2 Modules & Increase Motor HP				
Mill Model	No. of Rolls	Roll Width	Motor HP	Throughput lbs/hr
9066M	6	6.00"	7.5	2,000 - 2,500
9126M	6	12.00"	15.0	4,000 - 5,000
9186M	6	18.00"	25.0	7,000 - 8,000
9246M	6	24.00"	30.0	10,000 - 11,000

Throughput values are average observed and not guaranteed
Brewery Duty data is based upon processing Malted Barley with a density of 30 lb/cu-ft

Throughput values are average observed and not guaranteed
Distillery Duty data is based upon processing Shelled Corn with a density of 45 lb/cu-ft

Note: Motor HP values listed are nameplate values. Motors that are 7.5HP and above are 1800 RPM motors and speed regulated down to 1200 RPM by a VFD which also decreases the resulting HP. 5HP motors and below are 1200 RPM and run at base speed and HP.



SASQUATCH™
ROLLER MILLS
MALT MILLS FOR BREWERS & DISTILLERS

LIMITED WARRANTY POLICY

Revised 12/15/2018

Oronoko Iron Works, Inc. ("Manufacturer") warrants the original Buyer of its products ("Buyer") that goods of its manufacture ("Goods") shall be free from defects of materials and workmanship for 12 months from date of shipping from factory, and for 18 months from date of shipping from factory if products are installed by Manufacturer or its representative. End user must contact the Manufacturer within the warranty period to process a warranty. Warranty is not transferrable and is extended to the original Buyer only.

Manufacturer's sole obligation under the foregoing warranties will be limited to either – at Manufacturer's option – replacing defective goods (subject to limitations hereinafter provided) or refunding the purchase price for such Goods theretofore paid by the Buyer, and Buyers exclusive remedy for breach of any such warranties will be enforcement of such obligations of the Manufacturer. If the Manufacturer so requests the return of such Goods, the Goods will be redelivered to the Manufacturer in accordance with Manufacturer's instructions FOB Factory.

The remedies contained herein shall constitute the sole recourse of the Buyer against the Manufacturer for breach of warranty. **IN NO EVENT SHALL THE MANUFACTURER'S LIABILITY FOR ANY CLAIM FOR DAMAGES ARISING OUT OF THE MANUFACTURE, SALE, DELIVERY, OR USE OF THE GOODS EXCEED THE PURCHASE PRICE.**

The foregoing warranties will not extend to goods subject to misuse, neglect, accident, improper installation or maintenance, improper operation, or that have been repaired by anyone other than the Manufacturer or its authorized representative. **THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE OF ANY OTHER TYPE, WHETHER EXPRESSED OR IMPLIED.**

No person may vary the forgoing warranties or remedies, except in writing signed by a duly authorized officer of the Manufacturer. The Buyer's acceptance of delivery of the Goods constitutes acceptance of the foregoing warranties and remedies, and all conditions and limitations thereof.