



SASQUATCH HAMMER MILLS™

GRIST MILLS FOR BREWERS & DISTILLERS



Sasquatch Hammer Mill





Table of Contents

Thank You & Safety Information	2
Section 1. Uncrating the Mill	4
Section 2. Installing the Mill	5
Section 3. Operating the Mill	6
Section 4. Routine Mill Maintenance	7
Section 5. Clearing a Jam	8
Startup Checklist	Addendum A
Trouble Shooting	Addendum B
Motor Maintenance	Addendum C
Spare Parts List	Addendum D
Hammer Cartridge And Screen Installation	Addendum E
Mill Throughput & Motor Sizes	Addendum F

Thank You!

Thank you for your purchase of a **Sasquatch Hammer Mill**! Your hammer mill 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 Hammer Mill** will prove to be the workhorse you need it to be everyday.

About This Manual

From initial concept and design through its final production, your **Sasquatch Hammer 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 Hammer 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 hammer mill. Threaded rigid conduit, sealed fittings, and conductor seal should be used where applicable. The hammer 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 hammer mill **will** result in bodily injury or death.



WARNING! To ensure the safe and proper operation of your hammer 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 hammer 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 hammer 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 open the access door and should not be done except by properly trained professionals working in a maintenance capacity. Improper operation or use of the hammer mill **may** result in bodily injury or death.



WARNING! Operation of the mill with the door open 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 hammer mill **may** result in bodily injury or death.



CAUTION! When operating the mill make be 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 cleaning the hammer mill, 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 hammer mill **may** result in bodily injury or death.



WARNING! When replacing or servicing the hammers or hammer cartridge, 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 hammer mill **may** result in bodily injury or death.

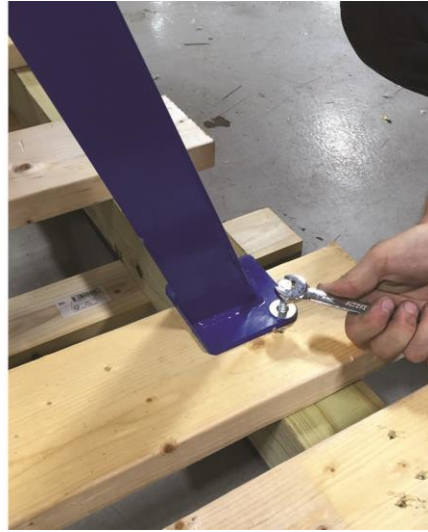
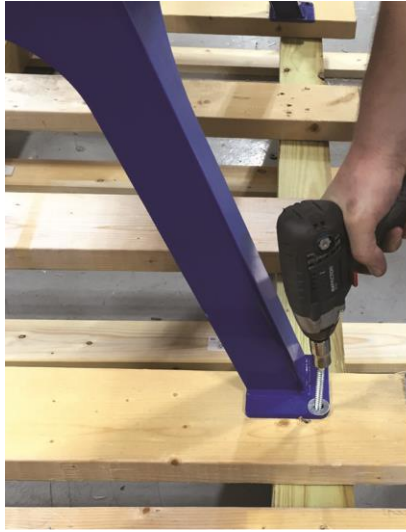


WARNING! When lubricating or otherwise servicing the motor, proper lockout and tagout procedures must be followed and should only be performed by properly trained professionals working in a maintenance capacity. Improper operation or use of the hammer mill **may** result in bodily injury or death.

Section 1. Uncrating the Mill

Your **Sasquatch Hammer 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 Hammer Mill** is designed to operate on a solid, flat, and level 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, 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.



IMPORTANT! Correct installation of your mill is critical and the key to it's 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.



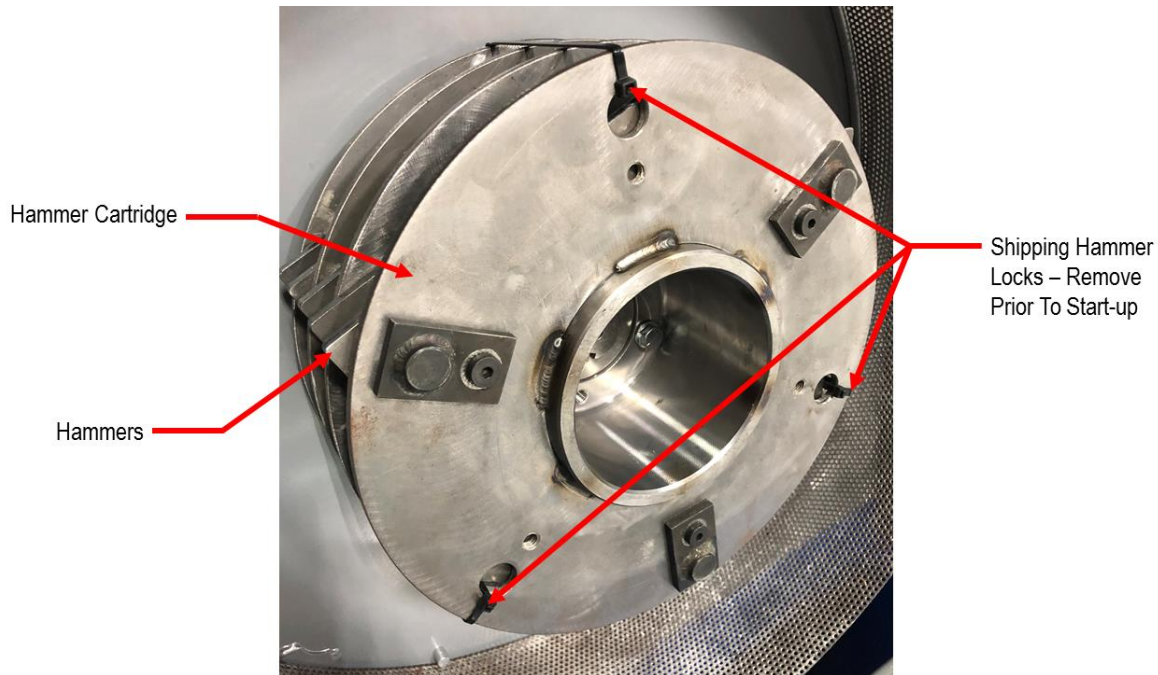
IMPORTANT! Attention should be paid to providing the correct power requirements to the mill installation site. Your approval drawing indicated your choice for power required to operate the motor supplied with your mill. The length of the power drop should be limited to 30 feet to avoid any power drop 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 above the motor on the back side of the housing indicates the required direction of rotation.



WARNING! The mill must not be started until the hammer locks are removed. Open the door and remove the wire ties which lock down the hammers during shipping. See photo below. Failure to comply **may** result in bodily injury and damage to the equipment, and **may** void the warranty!



Section 3. Operating the Mill

Your **Sasquatch Hammer Mill** is designed to operate with a minimal amount of controls. **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. After performing the Startup Checklist you are ready to start and operate the mill. Assume that the takeaway conveyance system is turned on and operating normally. Follow the Mill Operational Matrix listed below. When starting the mill motor, allow it to spool up to full speed which will take several seconds. A clanking noise will be heard as the hammers rotate out to full extension. When shutting the mill down, 1st – Shut down the product infeed system, 2nd – Stop the mill motor, 3rd - Stop the takeaway conveyance system in that order.

Hammer Mill Operational Matrix		
Mill Condition	Product Infeed System	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		



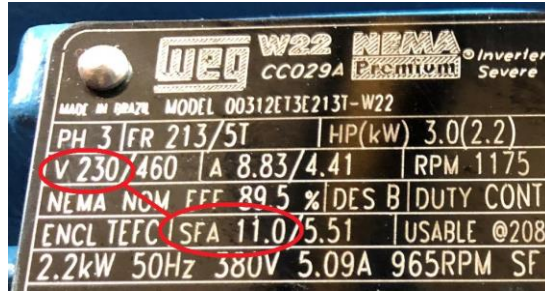
CAUTION! Never allow the mill to exceed Full Load Amps while grinding product. Continuous operation above Full Load Amps **will** result in the mill shutting down, **may** result in damage to the mill, and **may** void the warranty!



IMPORTANT! Managing the product infeed system throughout the grinding process is absolutely critical to assuring that there are no mill jams due to product being packed into the mill. The product infeed system must never be operated unless the mill motor is running.



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

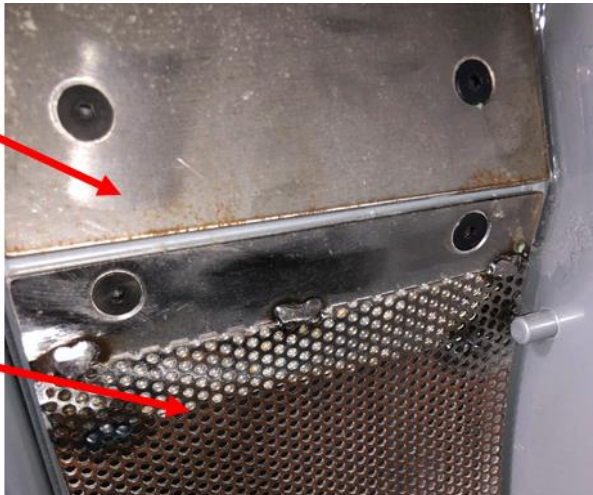


Section 4. Routine Maintenance

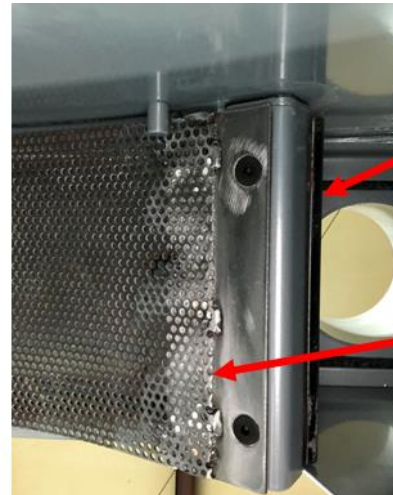
Your **Sasquatch Hammer Mill** is designed to operate with a minimal amount of maintenance required. However, the routine maintenance items covered in this section must be performed at the intervals listed in order to assure the performance and longevity of the mill.



IMPORTANT! The wear plates and grind screen should be checked monthly for excessive wear and be replaced accordingly. See photo below



Lower Side



Upper Side



IMPORTANT! The hammers should be checked monthly for excessive wear on the hard coat and be replaced accordingly. See photo below.



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

Section 5. Clearing a 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 fed into the mill with the mill not running. The product is then free to fall into the grinding area and pile up.

Unfortunately, many jams are not detected until the mill motor is started which jams the product into the mill 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** - Carefully open the front access door.
- STEP 4** - Clean out all of the jammed product by hand that is possible.
- STEP 5** - Rotate the Hammer Cartridge by hand if possible.
- STEP 6** - If it will not rotate freely, remove the cartridge according to **Addendum D** to clear the cartridge jam.
- STEP 7** - Remove the screen if necessary to allow thorough cleaning.
- STEP 8** - Once the jam is cleared, replace the hammer cartridge according to **Addendum D** and assure it rotates freely.
- STEP 9** - Replace the screen if it was removed in accordance with **Addendum D**.
- STEP 10** - Close the access door and latch it. Assure the interlock switch is functioning properly.
- STEP 11** - Remove all Lockout – Tagouts and return the mill to service.



SASQUATCHTM
HAMMER MILLS
GRIST 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.



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 product infeed system off and slide gate closed? NEVER start the mill with the infeed system on!
- 3 Is the front access door closed and latched?
- 4 Is the door interlock switch functioning correctly?
- 5 Are all motor mounting bolts tight?
- 6 Is the discharge hopper and takeaway conveyance system in-place and tight?
- 7 Is the power to the control panel on?

ADDENDUM B - HAMMER 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?	Is access door open?	Is access door interlock functioning correctly?	
Motor turning wrong direction	Is VFD setup correctly?	Interchange any two of the three motor leads							See Addendum C 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 C)?				
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?				
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?	Is the VFD limiting amps set correctly?			
Product Milling Issues	Check									
Ground particle size is inconsistent	Is the screen worn excessively?	Is the screen installed correctly?	Is the door pressure plate operating normally?							
Whole particles are getting through	Is the screen worn excessively?	Is the screen installed correctly?	Is the door pressure plate operating normally?							
Throughput is not as expected	Does the material being ground correspond to throughput?	Is there any bridging in the infeed system?	Is the mill being operated at FLA on ammeter?	Are the hammers damaged or excessively worn?	Is product moisture content too high?	Have all Electrical Issues listed above been ruled out?				
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 bushing tightened?	Are all mill mounting bolts to base plate tightened?	Are all infeed system mounting bolts tightened?	Is product moisture content too high?	Is there a foreign object in the mill?	Are all mill anchor bolts tightened?	Is the mill being operated in an overloaded condition?	
Mill is making unusual noises	Are all motor mounting bolts tightened?	Are all bolts in taper lock bushing tightened?	Has the interior of the mill been cleaned on schedule?	Is there a foreign object in the mill?	Are all mill anchor bolts tightened?	Is the screen loose or broken?	Are any of the hammers damaged?	Is the mill being operated in an overloaded condition?		



ADDENDUM C

Motor Maintenance & Mill Motor Matrix

Mill Motor Matrix – Page 2

A listing of all of the motors used on Sasquatch Hammer Mills, All three phase national and international voltages are available.

Motor Maintenance – Page 3-10

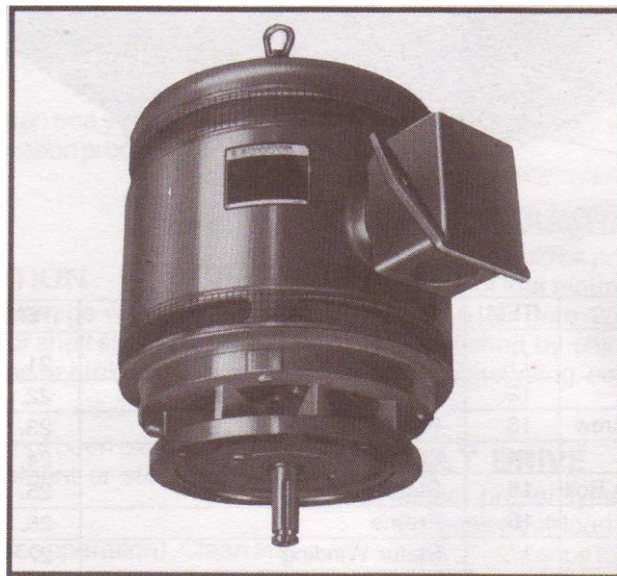
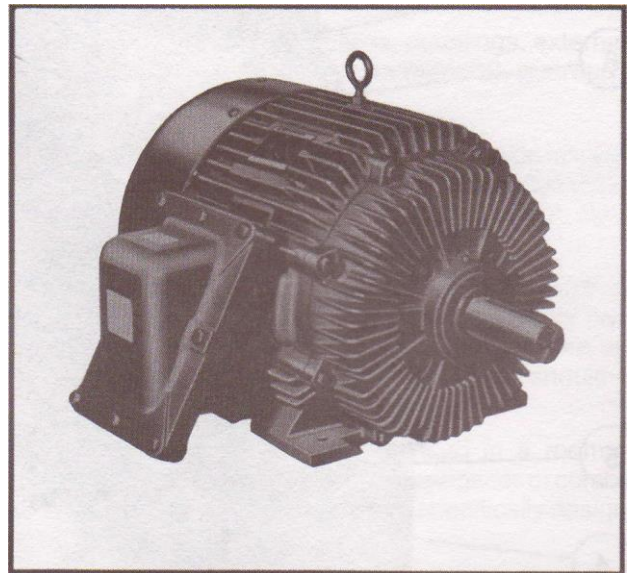
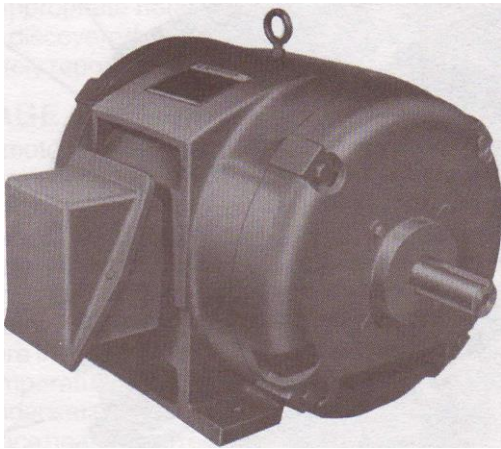
The entire Marathon Motor Operation, Installation, and Maintenance Manual is included.

Hammermill Motor Matrix

Mill	Base HP	VFD Hz	Base RPM
HM1101	10.0	60	1,750
HM1151	15.0	60	1,750
HM1201	20.0	60	1,750
HM1251	25.0	60	1,750
HM1301	30.0	60	1,750
HM1401	40.0	60	1,750
HM1501	50.0	60	1,750

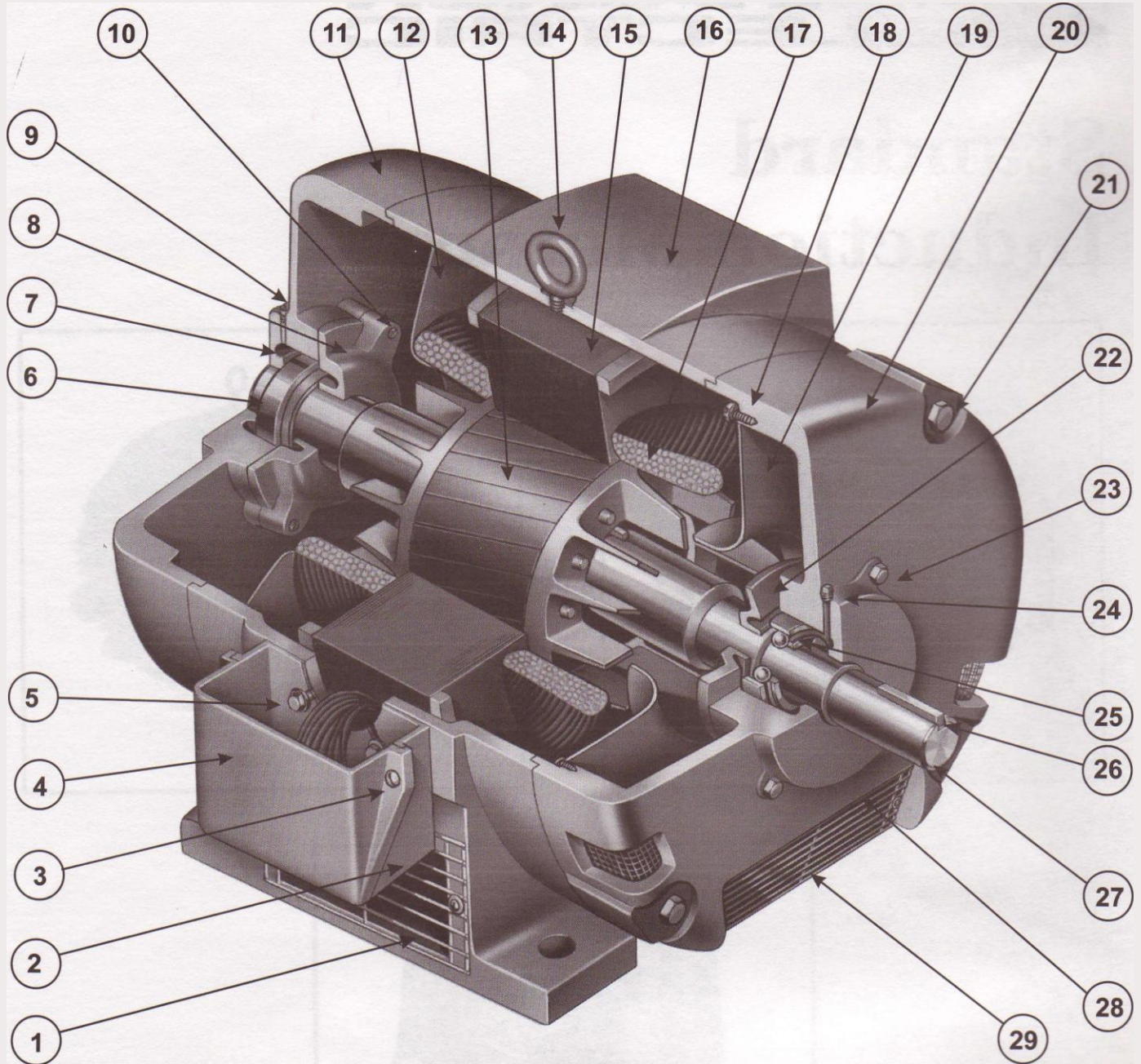
marathonTM
Motors

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.

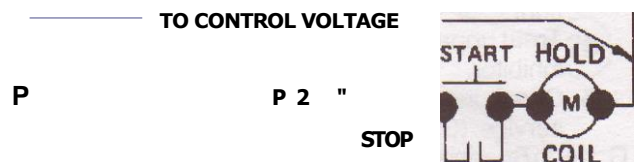


FIGURE 1

NORMALLY CLOSED PROTECTORS

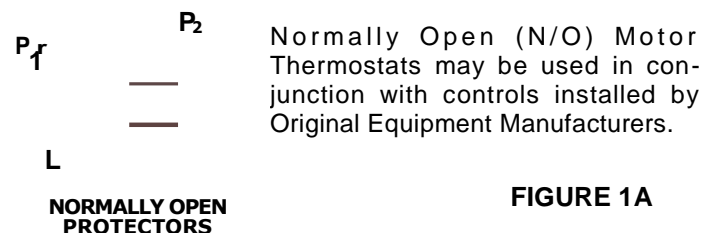


FIGURE 1A

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.

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

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 stalls	Motor may be overloaded	Reduce load.
	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.
Motor runs and then dies down	Open circuit	Fuses blown, check overload relay. stator and pushbuttons.
	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.
Motor vibrates	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
	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.
Unbalanced line current on polyphase motors during normal operation	Polyphase motor running single phase	Check for open circuit.
	Excessive end play	Adjust bearing or add shim.
	Unequal terminal volts	Check leads and connections.
	Single phase operation	Check for open contacts.
Scraping noise	Unbalanced voltage	Correct unbalanced power supply.
	Fan rubbing air shield	Remove interference.
	Fan striking insulation	Clear fan.
Noisy operation	Loose on bedplate	Tighten holding bolts.
	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.

ENGLISH


1. Foreword

The installation, operation and maintenance of the motor must be always performed by qualified personnel using proper tools and methods and following the instructions contained in the documents supplied with the motor.

The instructions presented in this document are valid for WEG motors with the following characteristics:

- Three-phase and single-phase induction motors (squirrel cage rotor);
- Three-phase permanent magnet motors;
- Three-phase hybrid motors (squirrel cage rotor + permanent magnets);


The objective of this manual is to provide important information, which must be considered during the shipment, storage, installation, operation and maintenance of WEG motors. Therefore, we advise to make a careful and detailed study of the instructions contained herein before performing any procedures on the motor. The noncompliance with the instructions informed in this manual and others mentioned on the website www.weg.net voids the product warranty and may cause serious personal injuries and material damages.



Electric motors have energized circuits and exposed rotating parts which may cause injuries to people.

2. Shipment, storage and handling


Check the conditions of the motor immediately upon receipt. Where any damage is noticed, this must be reported in writing to the transportation company, and immediately communicated to the insurance company and to WEG. In this case, no installation job can be started before the detected problem has been solved.




Take the required measures in order to ensure the degree of protection indicated on the motor nameplate:

- unused cable inlet holes in the terminal boxes must be properly closed with blanking plugs;
- the cable entries used must be fitted with components, such as, cable glands and conduits;
- components supplied loose (for example, terminal boxes mounted separately) must be properly closed and sealed;
- fixing elements mounted in the threaded through holes in the motor enclosure (for example, the flange) must be properly sealed.


The motor must be installed with overload protection devices. For three-phase motors, it is recommended to install a phase failure protection device. When motor is fitted with temperature-monitoring devices in the stator windings and/or bearings, they must be connected during the operation and even during tests.



For flying leads motors, do not push the overlength of leads into the motor in order to prevent that they touch the rotor.




Ensure the correct operation of the accessories (brake, encoder, thermal protection, forced ventilation, etc.) installed on the motor before it is started. Motors fitted with Automatic Thermal Protectors will reset automatically as soon as the motor cools down. Thus, do not use motors with Automatic Thermal Protection in applications where the auto-resetting of this device may cause injuries to people or damage to equipment. Motors fitted with Manual Thermal Protectors require manual reset after they trip. If the Automatic Thermal Protector or the Manual Thermal Protector trip, disconnect the motor from the power supply and investigate the cause of the thermal protector tripping.



W22 Magnet motors must be driven by WEG variable frequency drives only.

For more information about the use of variable frequency drives, follow the instructions in the motor manual 50033244 on the website www.weg.net and in the manual of the variable frequency drive.

4. Operation




During operation, do not touch the non-insulated energized parts and never touch or stay too close to rotating parts.

Ensure that the space heater is always OFF during the motor operation.

Check if the nameplate data matches the invoice data and the environmental conditions in which the motor will be installed. If the motor is not immediately installed, it must be stored in a clean and dry room protected against dust, vibrations, gases and corrosive agents, and with relative humidity not exceeding 60%.

In order to prevent water condensation within the motor during the storage period, it is recommended to keep the space heater ON (where provided). In order to prevent oxidation of the bearings and ensure an even distribution of the lubricant, rotate the motor shaft at least once a month (at least five turns), always leaving it in a different position. For bearings with oil mist lubrication systems, the motor must be stored horizontally, independently from the mounting configuration, with ISO VG 68 oil in the bearing, (the amount is indicated in the motor manual available on the website www.weg.net) and the shaft must be turned weekly. If the motors are stored for more than two years, it is recommended to change the bearings, or to remove, wash, inspect and relubricate them before the motor is started. After this storage period, it is also recommended to change the start capacitors of single-phase motors since they loss their operating characteristics.




Always handle the motor carefully in order to prevent impacts and damages to the bearings and always install the shaft transportation/locking device (if supplied) when transporting the motor. Use only the eyebolts to lift the motor. However these eyebolts are designed for the motor weight only. Thus never use these eyebolts to lift the motor with additional loads coupled to it. The lifting eyebolts of the terminal box, fan cover, etc., are intended to handle only these parts when disassembled from the motor. For multimounting motors (with removable feet/base), the eyebolts must be positioned according to the motor mounting position so that the lifting angle is vertically aligned (lifting at 0°). Additional information regarding the maximum allowable angle-of-inclination is indicated in the general manual available on the website www.weg.net.

Periodically and mainly before the initial star-up, measure the insulation resistance of the motor winding. Check the recommended values and the measuring procedures on the website www.weg.net.

The rated performance values and the operating conditions are specified on the motor nameplate. The voltage and frequency variations of the power supply should never exceed the limits established in the applicable standards. Occasional different behavior during the normal operation (actuation of thermal protections, noise level, vibration level, temperature and current increase) must always be assessed by qualified personnel. In case of doubt, turn off the motor immediately and contact the nearest WEG service center. Do not use roller bearings for direct coupling. Motors fitted with roller bearings require radial load to ensure their proper operation. For motors fitted with oil lubrication or oil mist systems, the cooling system must be ON even after the machine is OFF and until the machine is at complete standstill. After complete standstill, the cooling and lubrication systems (if any exist) must be switched OFF and the space heaters must be switched ON.

5. Maintenance



Before any service is performed, ensure that motor is it at standstill, disconnected from the power supply and protected against accidental energization. Even when the motor is stopped, dangerous voltages may be present in space heater terminals.


If motors are fitted with capacitors, discharge them before any handling or service is performed.

Motor disassembly during the warranty period must be performed by a WEG authorized service center only.

For motors with permanent magnet rotor (lines W22 Quattro and W22 Magnet), the motor assembly and disassembly require the use of proper devices due to the attracting or repelling forces that occur between metallic parts. This work must only be performed by a WEG Authorized service center specifically trained for such an operation. People with pacemakers cannot handle these motors. The permanent magnets can also cause disturbances or damages to other electric equipment and components during maintenance.

For the W50 and HGF motor lines provided with axial fans, the motor and the axial fan have different markings for indicating the direction of rotation for prevent incorrect assembly.

3. Installation




During the installation, the motors must be protected against accidental energization. Check the motor direction of rotation, turning it without load before it is coupled to the load.

Remove the transportation devices and shaft locking device (if supplied) before starting the motor installation. Motors must be only installed in places compatible with their mounting features and in applications and environments for which they are intended.

Those motors with feet must be installed on bases duly planned in order to prevent vibrations and assure perfect alignment. The motor shaft must be properly aligned with the shaft of the driven machine. Incorrect alignment, as well as improper belt tension, will certainly damage the bearings, resulting in excessive vibrations and even causing the shaft to rupture. The admissible shaft radial and axial loads indicated in the general manual of the website must be respected. Use flexible coupling whenever possible. When motors are fitted with oil lubricated bearings or oil mist lubrication systems, connect the cooling and lubrication tubes (where provided). For oil lubricated bearings, the oil level must be in the center of the sight glass.

Only remove the corrosion protection grease from the shaft end and flange immediately before the motor installation. Unless specified otherwise in the purchase order, WEG motors are dynamically balanced with "half key" and without load (uncoupled). The driving elements, such as pulleys, couplings, etc., must be balanced with "half key" before they are mounted on the shaft of the motors.



The motor must always be positioned so the drain hole is at the lowest position. Motors supplied with rubber drain plugs leave the factory in the closed position and must be opened periodically to allow the exit of condensed water. For environments with high water condensation levels and motor with degree of protection IP55, the drain plugs can be mounted in open position .

The axial fan must be assembled so that the indicative arrow for direction of rotation is always visible, viewing the non-drive end side. The marking indicated on the axial fan blade, CW for clockwise direction of rotation or CCW for counterclockwise direction of rotation, indicates the direction of rotation of the motor viewing the drive end side.


Regularly inspect the operation of the motor, according to its application, and ensure a free air flow. Inspect the seals, the fastening bolts, the bearings, the vibration and noise levels, the drain operation, etc. The lubrication interval is specified on the motor nameplate.

6. Additional information

For further information about shipment, storage, handling, installation, operation and maintenance of electric motors, access the website www.weg.net. For special applications and operating conditions (for example, smoke extraction motors, totally enclosed air over (TEAO), motors for high thrust applications, motors with brake, motors with encoder) refer to the dedicated manual supplied with the equipment, or the manual 50033244 available in the website or contact WEG. When contacting WEG, please, have the full description of the motor at hand, as well as the serial number and manufacturing date, indicated on the motor nameplate.

Warranty Term

WEG Equipamentos Elétricos S/A, Motors Unit ("WEG"), offers warranty against defects in workmanship and materials for its products for a period of 18 months from the invoice date issued by the factory or distributor/dealer, limited to 24 months from the date of manufacture. Motors of the HGF Line are covered for a period of 12 months from the invoice date issued by the factory or distributor / dealer, limited to 18 months from the date of manufacture. The paragraphs above contain the legal warranty periods. If a warranty period is defined in a different way in the commercial/technical proposal of a particular sale, that will supersede the time limits set out above.




For motors with degree of protection IP56, IP65 or IP66, the drain plugs must remain at closed position, being opened only during the motor maintenance procedures. The drain system of motors with Oil Mist lubrication system must be connected to a specific collection system.

Do not cover and block the motor ventilation openings. Ensure a minimum clearance of ¼ (25%) of the diameter of the air intake of the fan cover from the walls. The air used for cooling the motor must be at ambient temperature, limited to the temperature indicated on the motor nameplate.

For power cables and grounding system connections, terminal box and drip cover assembly, the tightening torques indicated on Table 3.1 must be respected.

Table 3.1 - Tightening torques for fixing elements [Nm]													
Component	M4	M5	M6	M8	M10	M12	M14	M16	M20	UNF 8x32	UNF 10x32	UNC 10x24	
Terminal block pins	1.0 to 1.5	2.0 to 4.0*	4.0 to 6.5	6.5 to 9.0	10.0 to 18.0	15.5 to 30.0	-	30.0 to 50.0	50.0 to 75.0	1.0 to 2.0	-	-	
Grounding	1.5 to 3.0	3.0 to 5.0	5.0 to 10.0	10.0 to 18.0	28.0 to 40.0	45.0 to 70.0	-	115.0 to 170	-	-	-	2.5 to 3.0	
Terminal box cover	-	3.0 to 5.0	4.0 to 8.0	8.0 to 15.0	15.0 to 30.0	25.0 to 40.0	30.0 to 45.0	35.0 to 50.0	-	-	-	2.5 to 3.0	
Drip cover installed in the fan cover	1.5 to 2.3	3.5 to 5.0	6.0 to 9.0	14.0 to 20.0	-	-	-	-	-	-	1.0 to 1.5	-	
Drip cover installed in NDE shield	-	3.5 to 5.0	6.0 to 9.0	14.0 to 20.0	-	-	-	-	-	-	1.5 to 2.0	2.5 to 3.0	

1) For 12-pin terminal block, the tightening torque range allowed is: minimum 1.5 Nm and maximum 2.5 Nm.



Motors installed outdoors or in the vertical position require the use of additional shalter to protect them from water; for instance, use of a drip cover. To prevent accidents, ensure that the grounding connection has been performed according to the applicable standards and that the shaft key has been securely fastened before the motor is started.

Connect the motor properly to the power supply by means of safe and permanent contacts, always considering the data informed on the nameplate, such as rated voltage, wiring diagram, etc.

For power cables, switching and protection devices dimensioning, consider the rated motor current, the service factor, and the cable length, among others. For motors without terminal block, insulate the motor terminal cables by using insulating materials that are compatible with the insulation class informed on the nameplate. The minimum insulation distance between the non-insulated live parts themselves and between live parts and the grounding must meet the applicable standards and regulations for each country.

The warranty periods above are independent of the product installation date and the startup.

If any defect or abnormal occurrence is detected during machine operation, the customer must immediately notify WEG in writing about the occurred defect, and make the product available for WEG or its Authorized Service Center for the period required to identify the cause of the defect, check the warranty coverage, and perform the proper repairs.

In order for the warranty to be valid, the customer must be sure to follow the requirements of WEG's technical documents, especially those set out in the product Installation, Operation and Maintenance Manual, as well as the applicable standards and regulations in force in each country.

Defects arising from the inappropriate or negligent use, operation, and/or installation of the equipment, non-execution of regular preventive maintenance, as well as defects resulting from external factors or equipment and components not supplied by WEG, will not be covered by the warranty. The warranty will not apply if the customer at its own discretion makes repairs and/or modifications to the equipment without prior written consent from WEG.

The warranty will not cover equipment, components, parts and materials whose lifetime is usually shorter than the warranty period. It will not cover defects and/or problems resulting from force majeure or other causes not imputable to WEG, such as, but not limited to: incorrect or incomplete specifications or data supplied by the customer; transportation, storage, handling, installation, operation and maintenance not complying with the provided instructions; accidents; defects in the construction works; use in applications and/or environments for which the machine was not designed; equipment and/or components not included in the scope of WEG supply. The warranty does not include disassembly services at the buyer's premises, product transportation costs and travel, lodging and meal expenses for the technical staff of the Service Centers, when requested by the customer.

The services under warranty will be provided exclusively at WEG authorized Service Centers or at one of its manufacturing plants. Under no circumstances will the warranty services extend the equipment warranty period. WEG's Civil Liability is limited to the supplied product; WEG will not be liable for indirect or consequential damages, such as losses of profit and revenue losses and alike which may arise from the contract signed between the parties.

EU DECLARATION OF CONFORMITY

Manufacturers:

WEG EQUIPAMENTOS ELÉTRICOS S.A.
Av. Prefeito Waldemar Grubba, 3000 - CEP 89256-900 Jaraguá do Sul – SC – Brazil
www.weg.net

WEG Linhares Equipamentos Elétricos S.A.
Rod. BR 101, Km 161.5, s/n. Distrito Industrial Rio Quental, Bairro Rio Quental de Baixo 29915-500 – Linhares – ES – Brazil
www.weg.net

WEG MEXICO, S.A. DE C.V
Carretera Jorobas - Tula Km 3.5, Manzana 5, Lote 1, Fraccionamiento Parque Industrial Huehuetoca, Municipio de Huehuetoca, C.P. 54680, CD. de Mexico y Area Metropolitana - Mexico
www.weg.net/mx

WEG (JIANGSU) ELECTRIC EQUIPMENT CO., LTD.
No. 15 Group, North City Street, Deyuan Community Rugao City, Jiangsu Province – China
www.weg.net/cn

WEG (NANTONG) ELECTRIC MOTOR
Manufacturing CO.LTD.
No. 128# - Xinkai South Road, Nantong - Economic & Technical Development Zone, Nantong, Jiangsu Province – China
www.weg.net/cn

WEGEURO – INDUSTRIA ELÉCTRICA S.A.
Rua Eng Frederico Ulrich, Apartado, 6074 4476-908 – Maia – Porto – Portugal
www.weg.net/pt

CONTACT PERSON: Luís Filipe Oliveira Silva Castro Araújo
Authorised Representative in the European Union
(Single Contact Point)

Branch – Santo Tirso: Parque Industrial da Ermida Avenida Luis Areal – Sta Cristina do Couto 4780-165 – Santo Tirso – Portugal
www.weg.net/pt

The manufacturer declares under sole responsibility that:

WEG electric motors and components used for following motor lines:
W01, W11, W20, W21, W22, W40, W50, HGF, Roller Table, W21 Magnet, W22 Magnet and W22 Quattro
.....

when installed, maintained and used in applications for which they were designed, and in compliance with the relevant installation standards and manufacturer's instructions, comply with the provisions of the following relevant European Union harmonisation legislation, wherever applicable:

Low Voltage Directive 2014/35/EU*
Regulation (EC) No 640/2009*, Regulation (EU) No 4/2014* and Directive 2009/125/EC*
Machinery Directive 2006/42/EC**
EMC Directive 2014/30/EU (electric motors are considered inherently benign in terms of electromagnetic compatibility)

The fulfilment of the safety objectives of the relevant European Union harmonisation legislation has been demonstrated by compliance with the following standards, wherever applicable:

EN 60034-1:2010 + AC:2010/ EN 60034-2-1:2007/ EN 60034-5:2001 + A1:2007/ EN 60034-6:1993/ EN 60034-7:1993 + A1:2001/ EN 60034-8:2007 + A1: 2014/ EN 60034-9:2005 + A1:2007/ EN 60034-11:2004/ EN 60034-12:2002 + A1:2007/ EN 60034-14:2004 + A1:2007/ EN 60034-30:2009/ EN 60204-1:2006 + A1:2009 + AC:2010 and EN 60204-11:2000 + AC:2010

CE marking in: **1996**
* Electric motors designed for use with a voltage rating higher than 1000V are not considered under the scope.
** Low voltage electric motors are not considered under the scope and electric motors designed for use with a voltage rating higher than 1000V are considered partly completed machinery and are supplied with a

Declaration of Incorporation:

The products above cannot be put into service until the machinery into which they have been incorporated has been declared in conformity with the Machinery Directive. A Technical Documentation for the products above is compiled in accordance with part B of annex VII of Machinery Directive 2006/42/EC. We undertake to transmit, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery identified above through WEG authorised representative established in the European Union. The method of transmission shall be electronic or physical method and shall be without prejudice to the intellectual property rights of the manufacturer.

Jaraguá do Sul, April 04th, 2018

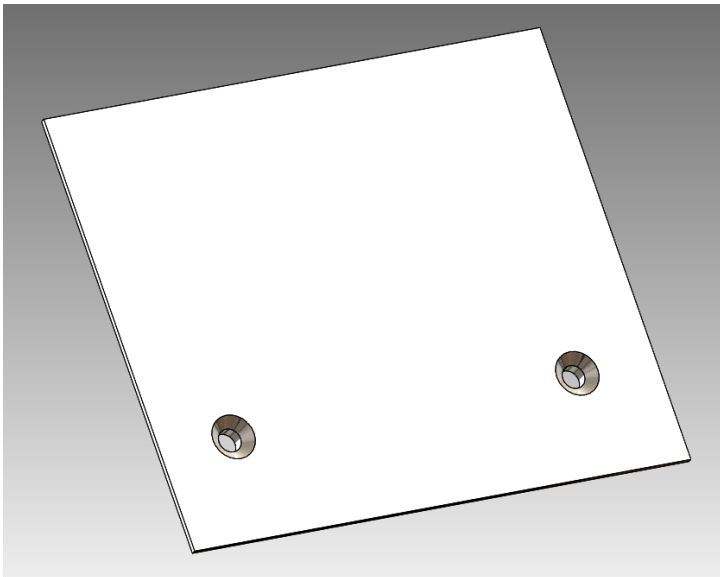

Signed for and on behalf of the manufacturer:
Milton Oscar Castella
Engineering Director



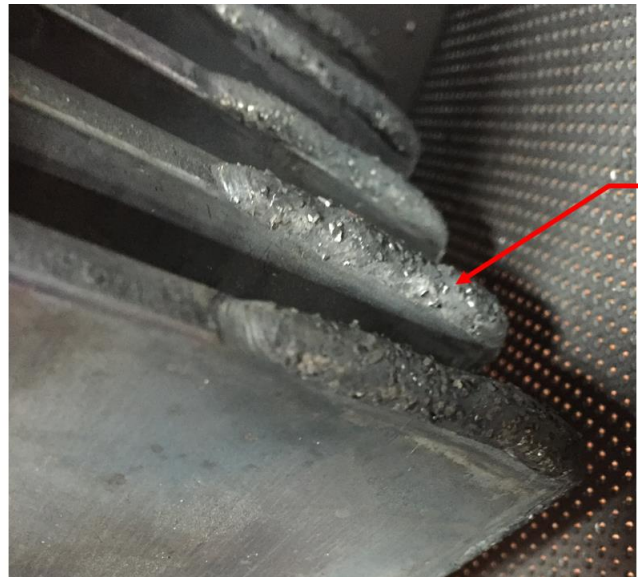
ADDENDUM D

Spare Parts

Your Sasquatch Hammer Mill has a minimal number of items that are categorized as Spare Parts which need to be replaced from time-to-time, and they are listed below.



Part No. HM-1025
Wear Plate – 2 Req'd



Part No. HM-1004
Hammer – Qty dependent upon
specific configuration

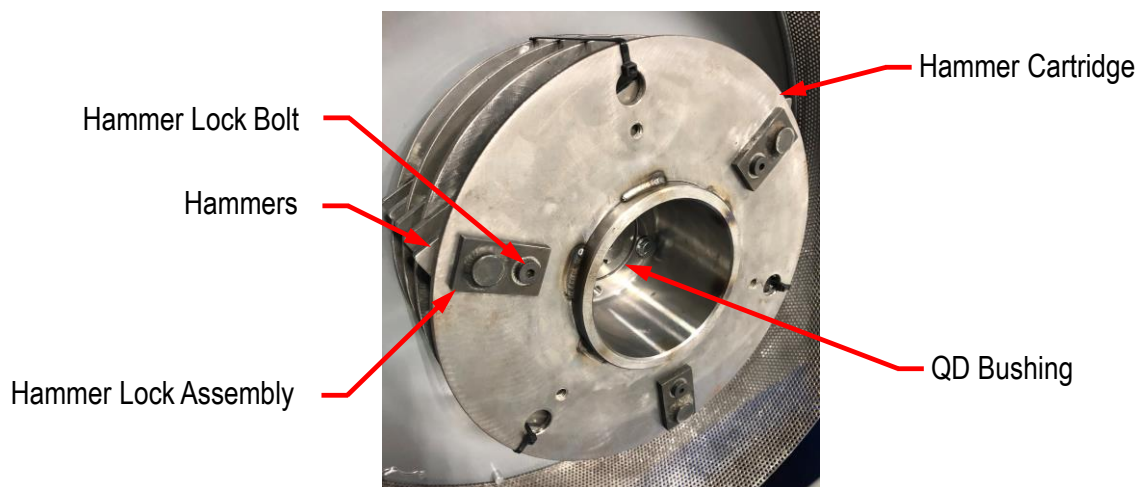


ADDENDUM E

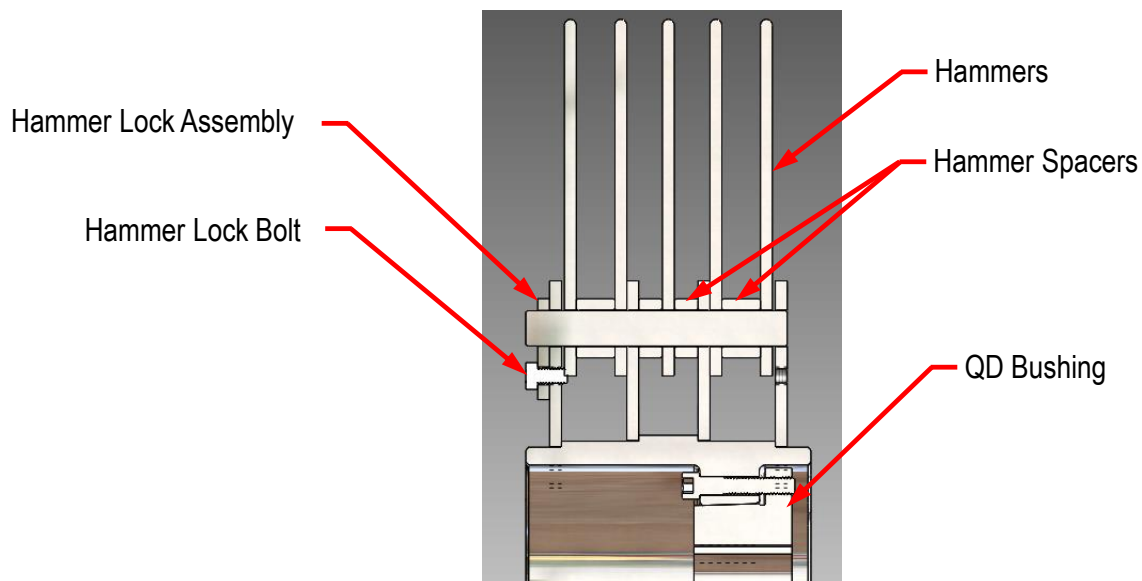
Servicing The Hammers, Wear Plates, & Screen

Hammer Cartridge Removal & Replacement

When servicing the mill it will be necessary from time-to-time to remove the hammer cartridge to replace the hammers. In order to remove the hammer cartridge the QD Bushing that mounts the hub will have to be loosened and removed. The bushing manufacturer's directions for doing that are included at the end of the addendum and should be followed to remove the hammer cartridge. Once the hammer cartridge is off, remove the Hammer Lock Bolts and pull the Hammer Lock Assembly out which will release all of the hammers and the hammer spacers. See photos below

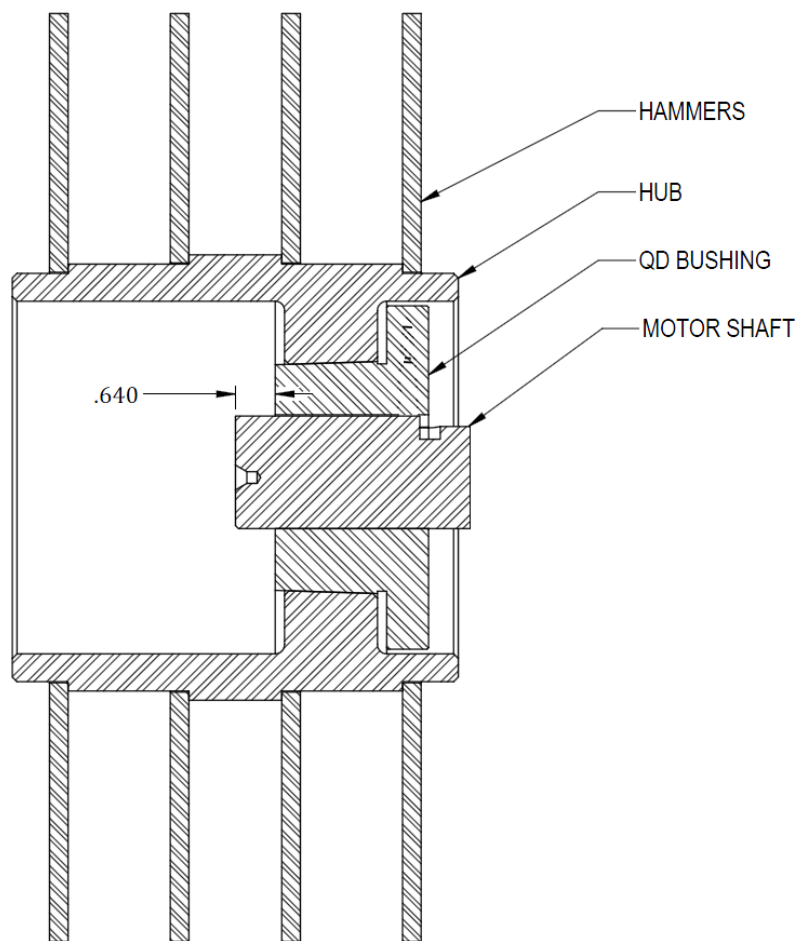


When replacing the hammers make sure that the spacers are installed correctly. The Hammer Lock Bolts are special low head bolts and must not be replaced with a standard bolt. See photo below





When replacing the Hammer Cartridge, it is imperative that the cartridge assembly be locked onto the shaft in the correct location. The graphic below indicates the correct placement. Follow the manufacturer's procedure below for tightening the QD bushing.

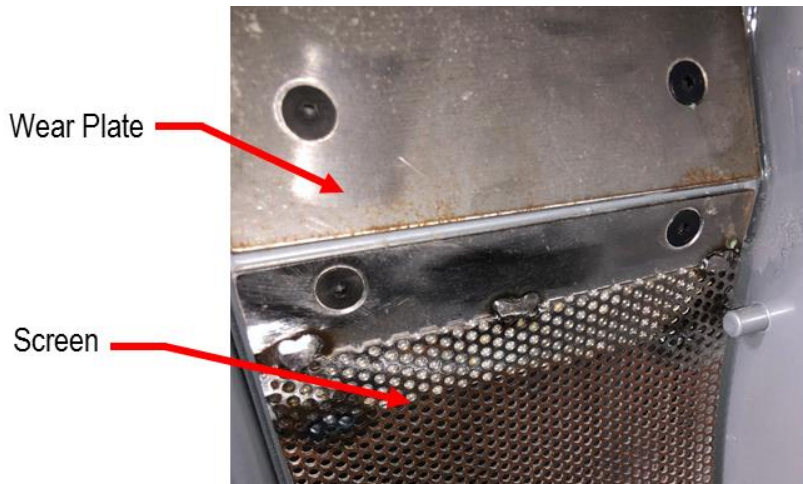


HM1101

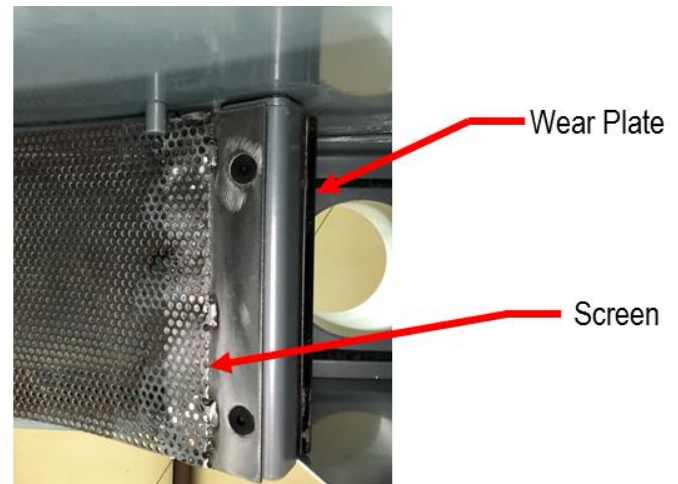


Screen And Wear Plate Removal & Replacement

When servicing the mill it will be necessary from time-to-time to remove and replace the screen and the wear plates. The screen is held in place by four flat-head machine screws – two at the upper mounting location at two at the lower mounting location. These areas are also where the wear plates are located which are also mounted with flat-head machine screws. See photos below.

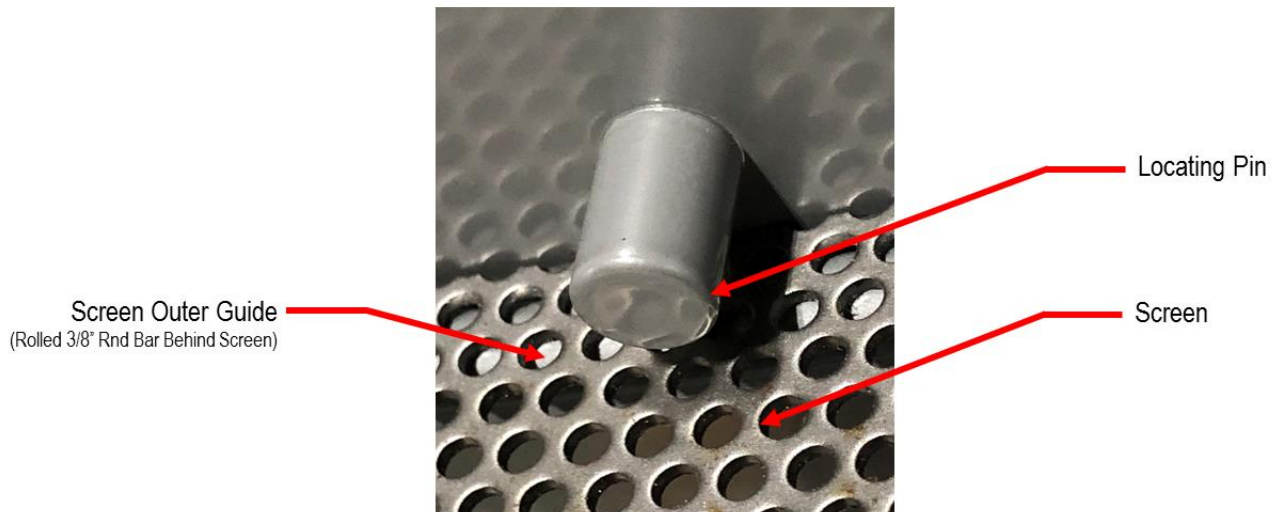


Lower Side



Upper Side

A rolled 3/8" round bar has been welded to the housing back plate to serve as an outer guide to keep the screen round and in the correct place. When replacing the screen, place the new screen between the outer guide and the locating pins and replace the mounting screws. . See photo below.



Stock QD Bushings

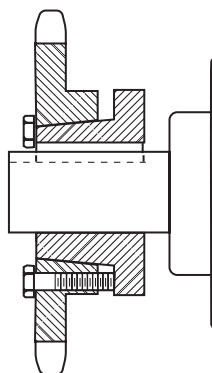


MOUNTING PROCEDURE – QD BUSHINGS

IMPORTANT – BE SURE TAPERED CONE SURFACES OF QD BUSHING AND INSIDE OF SHEAVE OR SPROCKET HUB ARE DRY AND FREE OF ALL FOREIGN SUBSTANCES SUCH AS PAINT, GREASE, OR DIRT.

STANDARD MOUNTING ASSEMBLY FOR QD SHEAVES AND SPROCKETS

MOUNTING

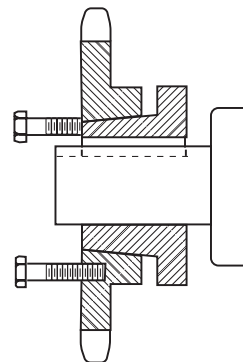


1. Be sure the tapered cone surfaces of the bushing and the inside of the driven product are clean and free of anti-seize lubricants.
2. Slide QD bushing on shaft, flange end first. Assemble key.
3. Position QD bushing on shaft. Tighten set screw over key "hand tight" with standard Allen wrench only. Do not use excessive force.
4. Slide large end of sheave or sprocket taper bore into position over cone aligning drilled bolt holes in sheave or sprocket with tapped holes in flange of bushing. Assemble pull-up bolts and lock washers.

NOTE: Install M thru S bushings in the hub so that the two extra holes in the hub are located as far as possible from the bushing's saw cut.

5. Tighten pull-up bolts alternately and evenly to tightness indicated in torque table on back. Do not use extensions on wrench handles. There should be a gap between the face of the sheave or sprocket hub and the flange of the QD bushing to insure a satisfactory cone grip and press fit.

CAUTION: THIS GAP MUST NOT BE CLOSED.



DISMOUNTING

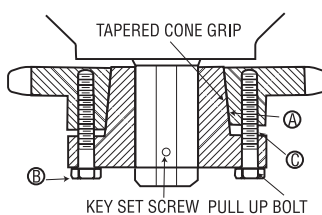
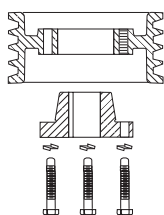
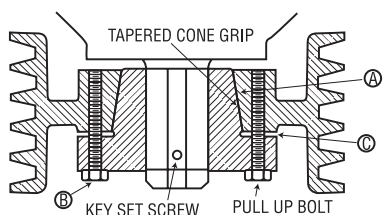
1. Remove pull-up bolts and screw them into TAPPED holes in sheave or sprocket and against flange of QD bushing to break cone grip.
1. Loosen set screw and slide QD bushing from shaft.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions given above must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. All rotating power transmission products when used in a drive are potentially dangerous and must be guarded by the user as required by applicable laws, regulations, standards, and good safety practice. (Refer to ANSI Standard B15.1.)

REVERSE Mounting Assembly

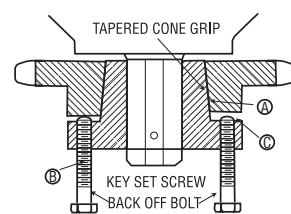
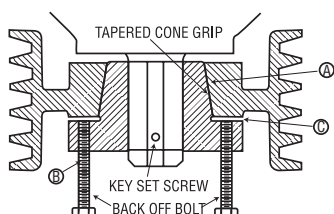
FOR QD SHEAVES AND SPROCKETS USING JA, SH, SD, SDS, SK, SF, E, F, AND J BUSHINGS

These bushings, as well as the sprockets and sheaves for them, are each drilled with six holes (three drilled and three tapped) to allow pull-up bolts to be inserted from either side. This enables variations of mounting characteristics to suit a particular installation.



1. Be sure the tapered cone surfaces of the bushing and the inside of the driven product are clean and free of anti-seize lubricants.
2. Assemble sheave or sprocket with bolts inserted (But not tightened) through DRILLED holes in bushing flange into TAPPED holes in sheave, sprocket, or other . . .
3. With key in shaft keyseat, slide assembly into approximate position on shaft with flange end of bushing away from bearing.
4. Position QD bushing on shaft by tightening set screw over key "hand tight" with standard Allen wrench only. Do not use excessive force.
5. Tighten pull-up bolts alternately and evenly to tightness indicated in torque table below. Do not use extensions on

wrench handles. There should be a gap between the face of the sheave or sprocket hub and the flange of the QD bushing to insure a satisfactory cone grip and press fit. **CAUTION: THIS GAP MUST NOT BE CLOSED.**



1. Remove pull-up bolts and screw them into TAPPED holes in bushing flange and against hub of sheave or sprocket to break cone grip.
2. Loosen set screw in bushing flange and slide QD bushing from shaft.

CAUTION

WARNING: USE OF ANTI-SEIZE LUBRICANT ON TAPERED CONE SURFACES OR ON BOLT THREADS WHEN MOUNTING MAY RESULT IN DAMAGE TO SHEAVES AND SPROCKETS. THIS VOIDS ALL MANUFACTURER'S WARRANTIES.

BOLT TORQUE TABLE

QD Bushing Size	Size of Cap Screw	Wrench Torque in./lbs.
JA	10 – 24	60
SH, SDS, SD	.25 – 20	108
SK	.3125 – 18	180
SF	.375 – 16	360
E	.5 – 13	720
F	.5625 – 12	900
J	.625 – 11	1620
M	.75 – 10	2700
N	.875 – 9	3600
P	1 – 8	5400
W	1.125 – 7	7200
S	1.125 – 7	9000



ADDENDUM F

Mill Throughput & Motor Sizes

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 Hammer 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 Hammer Mills come in two different sizes which are denoted by the motor size, either 10HP or 30HP. Mill throughput increases as the HP of the motor increases and also as the number of hammers increases.

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. If the hard coat on the hammers is worn or the mill needs a thorough internal cleaning, throughput may be 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. Physical characteristics such as moisture content, shell hardness, kernel size, and average kernel weight greatly affect mill throughput.



The table below lists observed throughput values for three different materials and two different motor HP sizes. Values listed reflect one set of hammers in each mill.

Hammer Mill Throughput in TPH						
Motor HP	10HP			30HP		
Screen	Corn	Wheat	Barley	Corn	Wheat	Barley
1/16	0.48	0.63	0.33	1.76	1.90	0.91
3/32	0.81	0.92	0.42	2.96	3.26	1.57
1/8	1.72	1.93	0.88	6.03	6.74	3.18
5/32	2.13	2.27	1.09	7.42	8.03	3.68
3/16	2.54		1.18	8.97		4.43
7/32	2.82		1.42	9.78		4.88
1/4	3.13		1.58	11.04		5.63
5/16	3.82		1.88	13.46		6.81
3/8	4.54			15.68		
1/2	6.13			21.52		
Throughput values are average observed on new equipment and not guaranteed.						