

# Thomas Scientific

Swedesboro, NJ 08085-0099 – U.S.A.



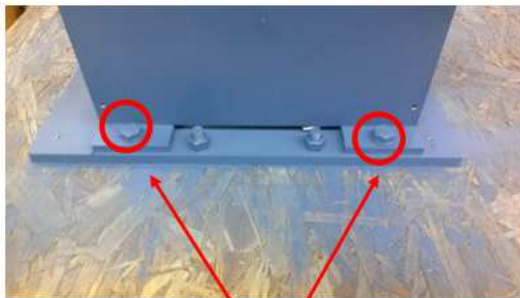
Wiley Laboratory Mill, Model 4  
3375E15 (115 V, 50/60 HZ, Single Phase, 1 HP)

**USE AND CARE OF CATALOG NUMBER:  
3375E15 Wiley Laboratory Mill, Model 4  
(115 V, 50/60 HZ, Single Phase, 1 HP)**

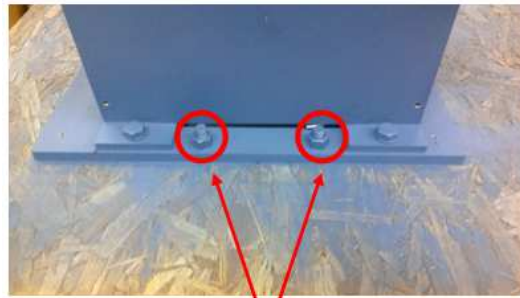
**UNPACKING AND INSTALLATION**

1. Uncrate the Model 4 mill by first removing the lid and the braces used to protect the apparatus during shipment. Remove the accessories packed with mill and finish uncrating.

**NOTE:** Do not remove mill from base mounting plate. The mill has been adjusted at the factory for proper blade clearance. If this mill is to be mounted to a bench, anchor through the pre-drilled base mounting plate holes.



Do Not Remove These Bolts



Remove These Bolts To  
Anchor Mill To Bench Top

2. Mill has been properly adjusted at the factory. However, it is recommended that clearance of all stationary and rotor knives are checked manually before power is turned on, in the event any of the knives have shifted during shipment.

**CAUTION:** Exercise extreme care in any operation involving mill knives. Knife-edges are sharp and dangerous if handled carelessly.

3. Open chamber door. Make certain that rotor knife ends do not project beyond the front and rear faces of the rotor. Check for “tip to tip” clearance between all rotor knives and all stationary knives by placing a piece of paper of average thickness (.002 to .003 in) against each stationary knife in turn and turning the rotor by hand counterclockwise so that all four rotor knives pass the stationary knife. Knives should touch the paper but not cut it.

4. If knives require adjustment, see the paragraphs covering adjustment in the replacement of knives section to follow.
5. Make certain that chamber door safety switch is operating correctly: it should complete the electrical circuit to the motor only when the chamber door is closed and latched, and should open this circuit immediately as soon as door is opened. In order to restart the mill door must be closed and latched. Additionally the power must be turned off for at least one minute before restart; otherwise the mill will not operate.
6. If using a motor other than the one supplied, please note:
  - A. In most cases a ½-HP motor is sufficiently powerful, but 1-HP may be required for grinding some material.
  - B. Rotor should turn counterclockwise, at between 400 and 800 RPM.
  - C. All Wiley mills are provided with a single-groove, 6 3/16 inch diameter “A” or “B” section driven pulley, and a 3 inch diameter motor pulley, and a 3 inch diameter motor pulley with a 5/8 inch bore.
7. The cutting chamfer and rotor have been covered with a protective coating against corrosion during storage and shipment. Remove this coating with kerosene or other petroleum solvent before putting the mill into operation.

### **STARTING AND STOPPING THE MILL**

1. To start the mill first turn the power on using the red power switch. Then press the green start switch to start mill rotation. To stop the mill turn the power off using the red power switch.

### **OPERATION**

1. The Wiley mill has been used successfully for a wide variety of materials. Samples should be free of hard inorganic material, although a small amount of such material, smaller than 24 mesh, usually will not interfere with milling. Washing such material from samples will, however, prevent any problems and protect the mill.

NOTE: If there is any doubt about the suitability of the Wiley mill for preparing any specific material for analysis, a sample of the material in question may be sent to use for milling. We expect that our customer will determine, before submitting the samples, whether material will ignite or explode as a result of milling. Pharmaceutical compounds or other materials that may cause a hazardous or noxious dust should carry a warning so that proper precautions may be taken. If found suitable, we will return, without a charge, a milled sample with a report on all pertinent details of the test.

2. Samples containing excessive moisture or oil can not be satisfactorily run through the mill since they tend to cling to the walls of the chamber. It is recommended that these samples be dried or given preliminary extraction with suitable solvents before milling.
3. Feed the sample into the hopper slowly enough so that the mill does not slow down or become jammed. Optimum feed rate will vary with the type of material being ground. A sliding shutter at the bottom of the hopper controls the rate of feed.
4. Four hardened steel knives, bolted to the rotor, work with a shearing action against six stationary knives mounted in the periphery of the chamber. A stainless steel screen is fitted to the frame in such a way that no material can come out of the grinding chamber until it is fine enough to pass through the mesh of the screen. Three screens, of 0.5 mm, 1 mm and 2 mm mesh respectively, are furnished with each mill. (Other meshes are available, as listed under Thomas 3375G25, G30, G35 and G40.)

NOTE: To interchange screens, loosen the two hand wheels at the bottom off the mill, until screen alignment pins disengage. Remove and replace screen and tighten hand wheels.

5. All mills are provided with two types of delivery chutes, which are interchangeable. One delivery chute has an outlet threaded to accommodate standard Mason jars (up to 2 qt capacity); the other provides for the mounting of a 1200 ml stainless steel beaker.

NOTE: If desired, a bag or sack can be fastened to the threaded delivery chute in place of Mason jar.

## **LUBRICATION**

1. The rotor shaft bearings have been lubricated at the factory. When mill is in regular operation, bearings should be greased. Grease should be applied to the automotive style grease fittings on the upper portion of the bearing housing, using the grease gun provided.
2. The standard motor has sealed bearings that will not require lubrication for many years.

## **REPLACEMENT OF KNIVES**

**CAUTION:** Make certain all electric power to the mill is shut off before replacing any blades. Unplug mill from outlet as additional safety precaution.

1. Remove hopper from the top of the mill and open chamber door.
2. Turn rotor so that the cap screws of the rotor knife to be removed face upward toward the feed chute. Wedge the rotor with a block of wood to prevent its rotation in either direction.
3. Using the wrench provided, remove the two cap screws and lift knife from rotor.
4. Clean the knife seat, making certain that all burrs, chips and dirt have been removed.
5. Mount one of the replacement knives in the seat. (See illustration for correct position of beveled edges of knives.) Make certain that knife is positioned as far to the rear of its seat as possible, and also that the ends of the knife do not project beyond the front and rear faces of the rotor. Insert and tighten the two cap screws.
6. Repeat steps 2, 3, 4 and 5 for the remaining knives.

**NOTE:** Rotor knives must be replaced as a set. However, if only one knife of a set is damaged, the remaining three may be used as replacements for stationary knives: the design is identical. Threaded studs must be inserted into the knives to allow their use in this manner.

7. There are two pairs of setscrews associated with each stationary knife (see illustration). The pair which are in line with the threaded stud attached to the knife act as a back stop and also allow minute up and down adjustments to be made on either side of the knife. The other pair of setscrews, located clockwise from the threaded stud, bear on the clamping bar, holding the clamping bar and thereby the knife itself firmly in position.
8. Loosen the pair of setscrews holding the clamping bar on the first stationary knife that is to be replaced. (If replacing the entire set of stationary knives, it may be convenient to start with the knife in the upper right.)
9. Hold or support knife and remove the two nuts from the threaded stud. Carefully remove knife. Remove clamping bar from its slot.
10. If other knives are being replaced, remove the remaining knives, proceeding clockwise.

11. Unpack replacement knives. Replace the knife-clamping bar. Insert threaded stud into its hole and seat knife in slot. (See illustration for correct position of knife bevel.) Replace the two nuts and draw the knife up so that there is ample clearance between it and the rotor knives. Repeat this operation for all knives being replaced, and also draw up any remaining knives.
12. Loosen nuts of the first stationary knife to be adjusted. Insert a piece of paper of the necessary thickness between the knife and any of the rotor knives, and adjust the clearance by raising or lowering the stationary knife until it pinches the paper but does not sever it.
13. Slightly tighten the two setscrews holding the clamping bar on the knife. (May require further adjustment later.)
14. Turn rotor to make certain that all rotor knives clear the installed stationary knife. If one rotor knife projects beyond the others, adjust clearance of stationary knife with respect to this rotor knife. Identify this rotor knife and make all stationary knife adjustments to it.
15. Repeat steps 12 and 13 above for the remaining stationary knives. Recheck all clearance and all associated nuts and set screws.

NOTE: Do not over-tighten to the point where threads may be stripped.

## **REPLACEMENT OF KNIVES – ALTERNATIVE METHOD**

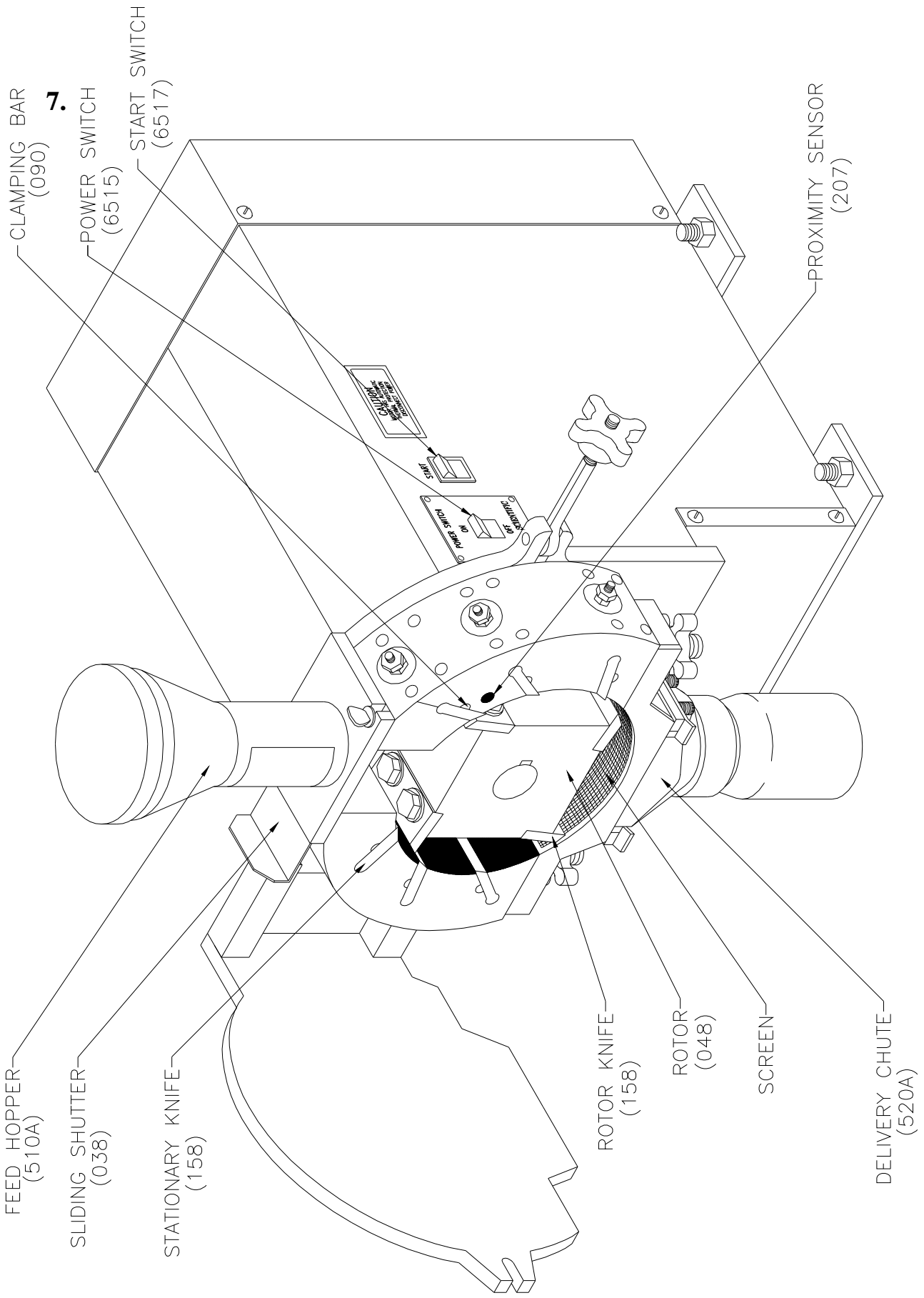
1. It may be desirable to replace knives with the rotor removed from the grinding chamber. Remove hopper, open chamber door, and proceed as follows:
2. Loosen setscrew on rotor (approximately 2 ½ turns) and carefully slide rotor off shaft.

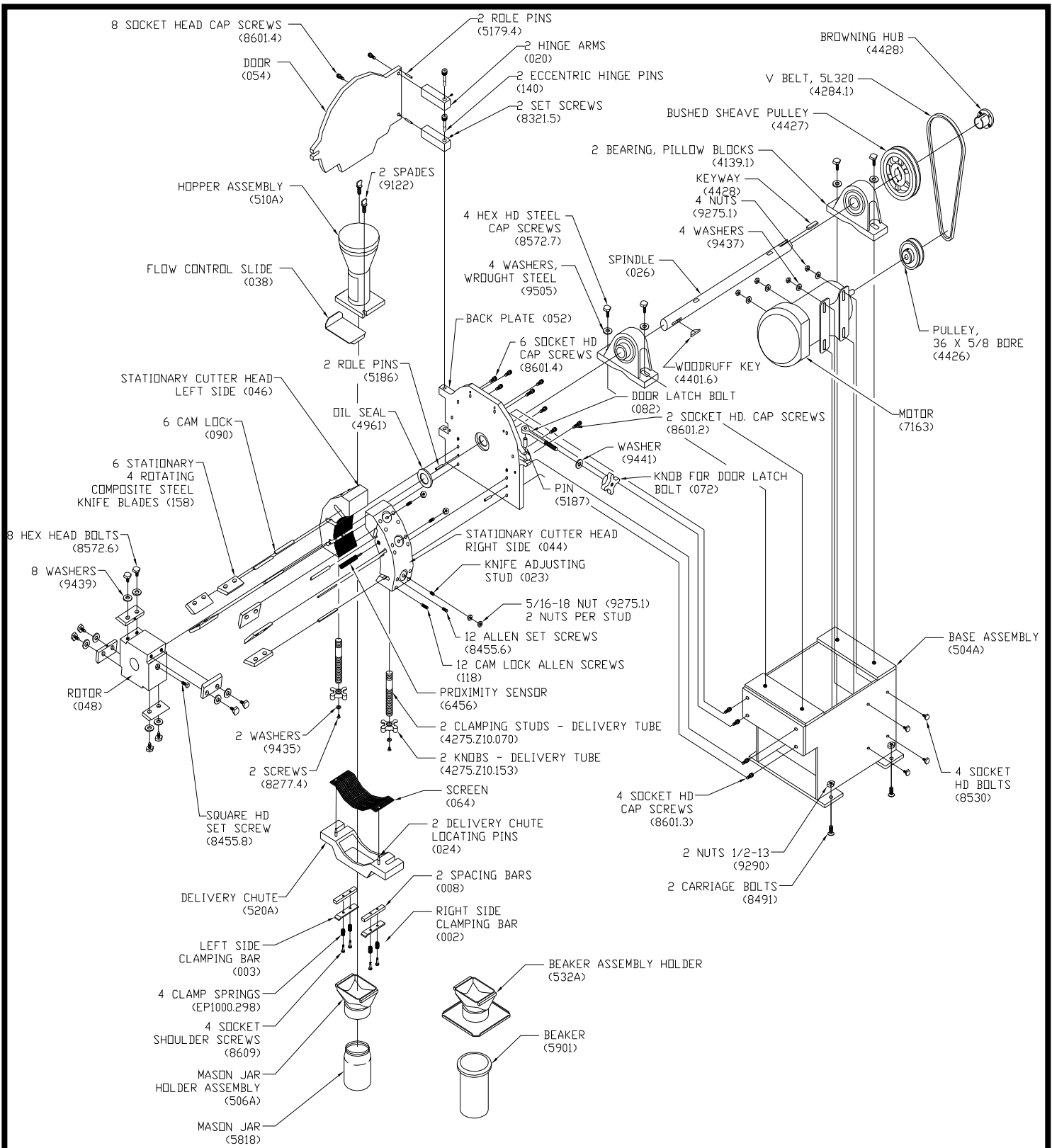
**CAUTION:** Rotor is extremely heavy. Proceed with care.

3. Set rotor down on its rear face and remove all four knives, using the wrench provided.
4. Remove and replace the rotor knives, following the procedure given in steps 5 and 6 of the replacement of knives section.
5. Replace any stationary knives that need replacement at this time, following the procedure given in steps 7 through 11 of the replacement of knives section.
6. Replace rotor slowly and carefully on the shaft. Insert piece of paper of necessary thickness between rear face of rotor and the inside rear of the mill. Using paper as a clearance gauge, slide rotor to rear, tighten setscrews on rotor shaft, and remove the paper.
7. Complete the adjustment of the stationary blades, following the procedure given in steps 12 through 15 of the replacement of knives section.

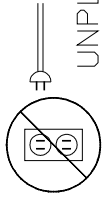
## **REPLACEMENT OF BEARINGS**

1. Remove rotor. See "replacement of knives-alternate method" above.
2. Remove 10 each screws on cover and remove cover.
3. Remove the drive belt by loosening 4 each bolts on motor mount to relieve tension on belt.
4. Loosen 2 each set screws that hold the shaft on each bearing pillow block holder and remove the shaft with pulley out the back of the unit.
5. Remove 2 each bolts on each bearing pillow block and replace with new bearing pillow blocks.
6. Reverse steps 1 through 4 to reinstall shaft and rotor





MODEL 4 WILEY MILL: RETURN TO SERVICE INITIAL MAINTENANCE PROCEDURE.



1. > UNPLUG UNIT! DISCONNECT UNIT FROM UTILITIES!
2. > REMOVE DRIVE BELT.
3. > TURN PULLEYS BY HAND TO FEEL OBSTRUCTIONS.
4. > GREASE (2) FITTINGS AND (2) BEARINGS.
5. > CHECK CLEARANCE (0.003 TO 0.004 INCHES) BETWEEN ROTATING-CUTTERHEAD TO BACKPLATE
6. > CHECK CLEARANCE (0.003 TO 0.004 INCHES) BETWEEN ROTATING-CUTTERHEAD TO DOOR.
7. > CHECK AND CLEAN MOTOR IF NECESSARY.

