
Operating and Maintenance Manual

MIKRO-BANTAM® & SAMPLMILL®

Customer:
Serial No.:

Record the model and serial number of your equipment and always refer to them when ordering replacement parts or requesting service assistance.

For replacement parts or service, call (800) 526-4491.



HOSOKAWA MICRON POWDER SYSTEMS

10 Chatham Road, Summit, NJ 07901 • Tel. (908) 273-6360 • Fax (908) 273-7432



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Aftermarket Services

Thank you for choosing Hosokawa Micron Powder Systems as your supplier of powder processing equipment.

As a Hosokawa Micron Powder Systems customer, you receive much more than high quality equipment and spare parts. Your purchase is supported by our extensive resources and more than seventy years of applications experience, all of which are combined in our Aftermarket Services team.

We will work with your operators, engineers and managers to keep your powder processing lines up and running. When you're ready to automate, integrate, modernize or expand, call us—we're ready to help.

AFTERMARKET SERVICES

For technical assistance, please call us at (908) 273-6360. You may request to speak directly to the departments listed below. Additional information about our services is available from the Aftermarket Services Department.

PROCESS TECHNOLOGY

Our Process Technology Department consists of engineers who are dedicated to providing state-of-the-art powder processing assistance.

- System optimization
- Process troubleshooting
- Technical seminars
- Installation consultation
- System upgrades

MECHANICAL FIELD SERVICE

Our Mechanical Field Service group has been through extensive training and has experience providing:

- Mechanical start-up
- Mechanical repair
- Maintenance seminars
- Mechanical inspections/evaluations

ELECTRICAL DESIGN/CONTROLS

Our Electrical Design/Controls Department designs all of our control systems, from basic relay logic to automated PLC-based systems.

- Electrical start-up assistance
- Electrical repair or troubleshooting
- Control System consultation
- Control System upgrades

SPARE PARTS

Our Spare Parts Department works closely with our Procurement and Manufacturing personnel to ensure promptness of spare parts order deliveries.

- Blanket spare parts orders
- In-house factory repair
- In-house rebuilds/refurbishing
- Quantity discounts
- 24-hour delivery of stock items

FOREWORD

The BANTAM® and SAMPLMILL® MIKRO-PULVERIZER hammer mill are high speed, close tolerance, small hammer mills that are primarily used for small quantities of material or for grinding analytical samples in a laboratory environment.

The basic design of the Bantam® incorporates a motorized Feed Mechanism. The Feed Screw System of the Samplmill® is operated manually.

Record your machine MODEL TYPE and SERIAL NUMBER. Refer to them when ordering replacement parts.

IMPORTANT:

Before installing, operating or maintaining this equipment, carefully read this Manual and follow the Safety recommendations in Section II.

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SECTION I

PROCESS DESCRIPTION

1-1.- PROCESS DESCRIPTION:

Grinding and pulverizing are processes in which materials are reduced in size as they are impacted by high speed rotating hammers. The term "pulverizing" is applied to fine grinding and derives from the word "polvo" (dust).

Hammer Mills are made in a number of different configurations, but consist essentially of a revolving shaft with either rigid or free swinging hammers. Hammers are designed in different sizes and shapes depending on the application. The shaft and rotor rotate in a housing which contains liners or breaker plates of various configurations. A screen encloses the bottom of the rotor to regulate the size of discharged product.

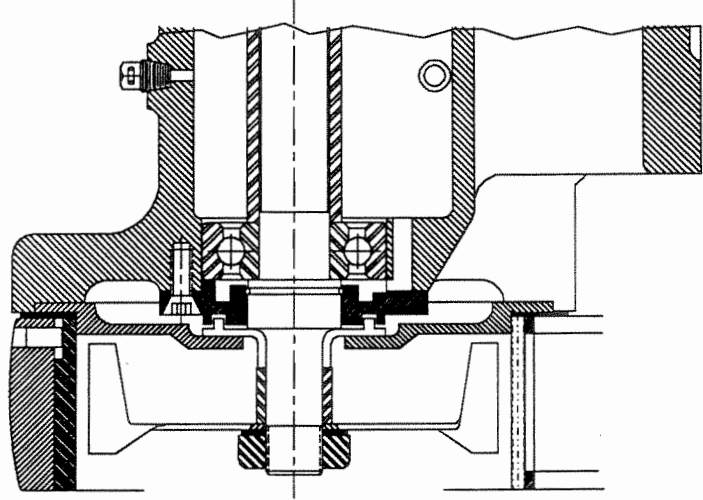
The most important variables in the pulverizing operation are:

- The size, power, and configuration of the Hammer Mill.
- The tip speed of the hammers.
- The type of hammers used.
- The size and configuration of the screen.
- The condition of the grinding and impact surfaces.
- The characteristics of the material to be processed.

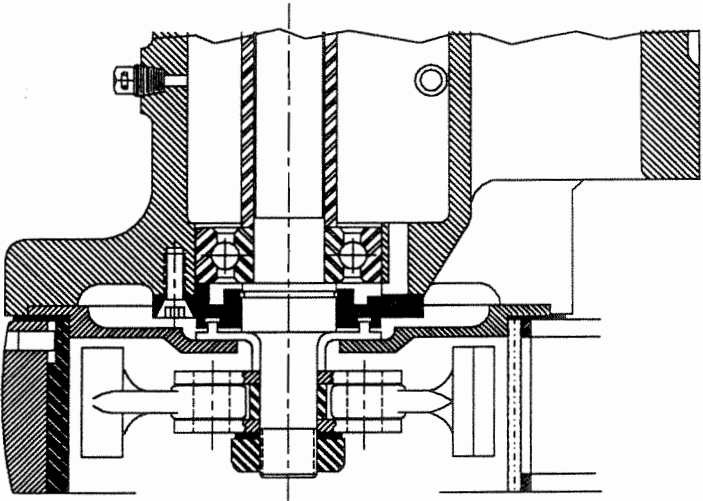
The size, power, and configuration of the pulverizer; along with the feed material size and required particle size of the finished product, determine the grinding capacity of the mill.

The speed of the hammers is a factor which affects the fineness of the product. The faster the speed, the finer the product.

The type of hammer selected is very important (Refer to Fig. 1). The Bantam™ T-Hammer and Samplmill™ stamped rotor are used for fine grinding. Bar type hammers are used for coarser grinding or for producing a narrower particle size distribution.



SAMPLMILL STAMPED ROTOR



BANTAM T-HAMMER

ROTOR ASSEMBLY TYPES
(BAR HAMMERS NOT SHOWN)

FIG. 1

The final item affecting the size of the finished product is the size and configuration of the screen holes. A smaller screen opening will deliver a finer product.

Generally, the process can be summarized as follows (Refer to Figure 2):

The material is fed into a hopper mounted above the Feed Screw. A variable speed (or manually operated) screw conveys the material in a uniform fashion to the grinding chamber.

The hammers impact the material as it enters the grinding chamber propelling it toward the liner. This action fractures the material and is repeated until the particle size is small enough to allow the product to pass through the screen located at the bottom of the mill body.

There is an adjustable vent on the side of the cover to allow air to enter the grinding chamber for purpose of cooling and also to reduce any vacuum at the feed screw mechanism produced by the fan action of the rotor. A larger vent, typically connected to an air relief bag, is located on the main body of the mill. Its function is to allow for an escape path for the air flow created by the rotor. The air relief bag also traps fine dust particles created during the grinding process.

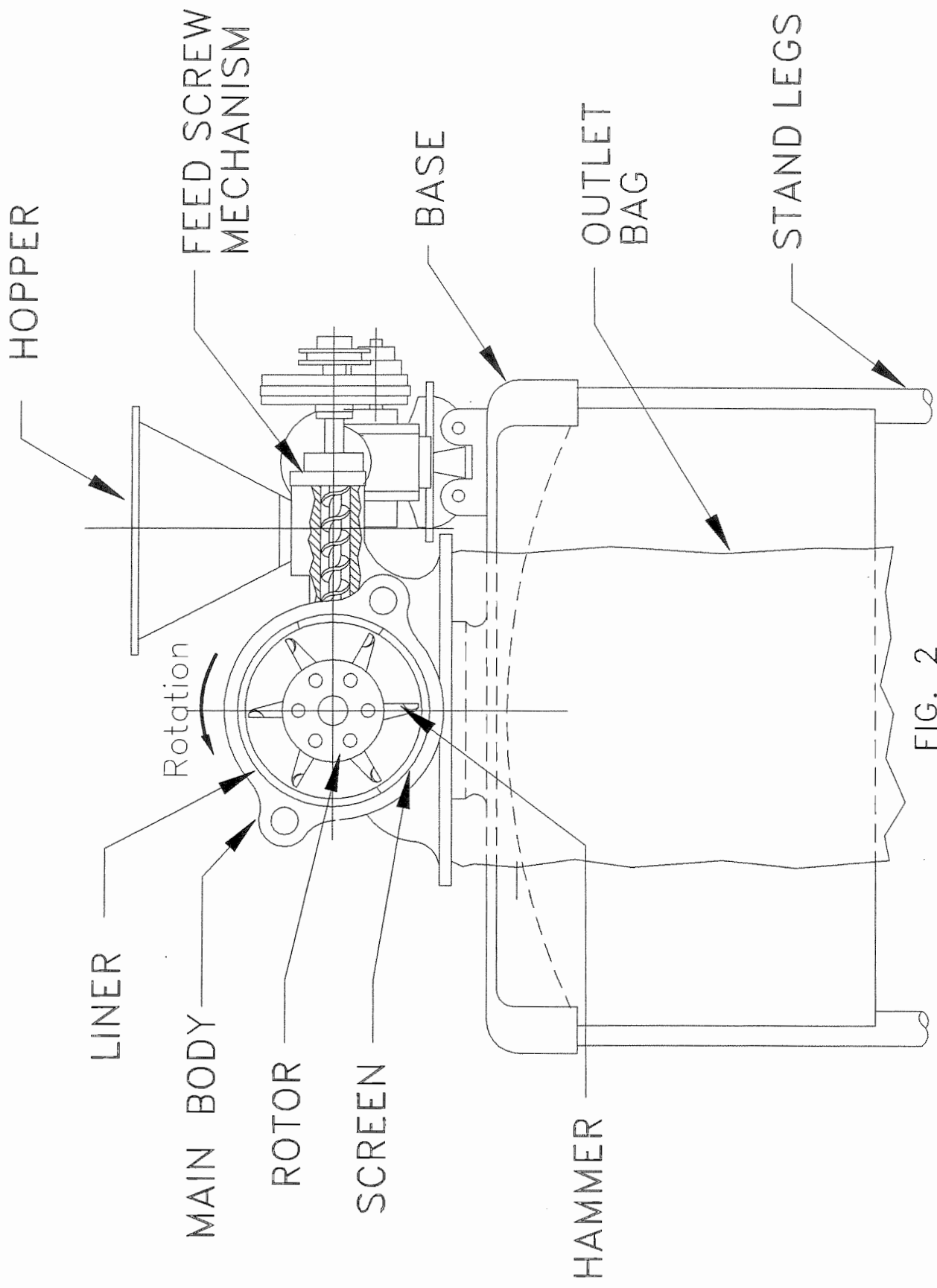
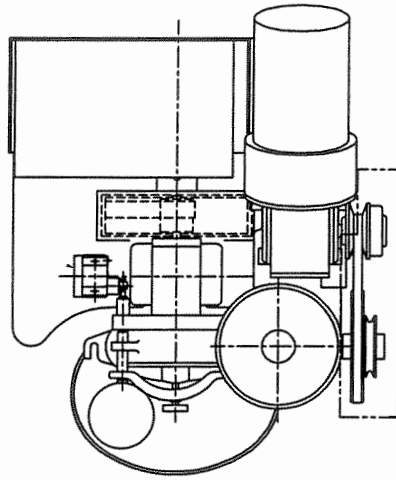


FIG. 2

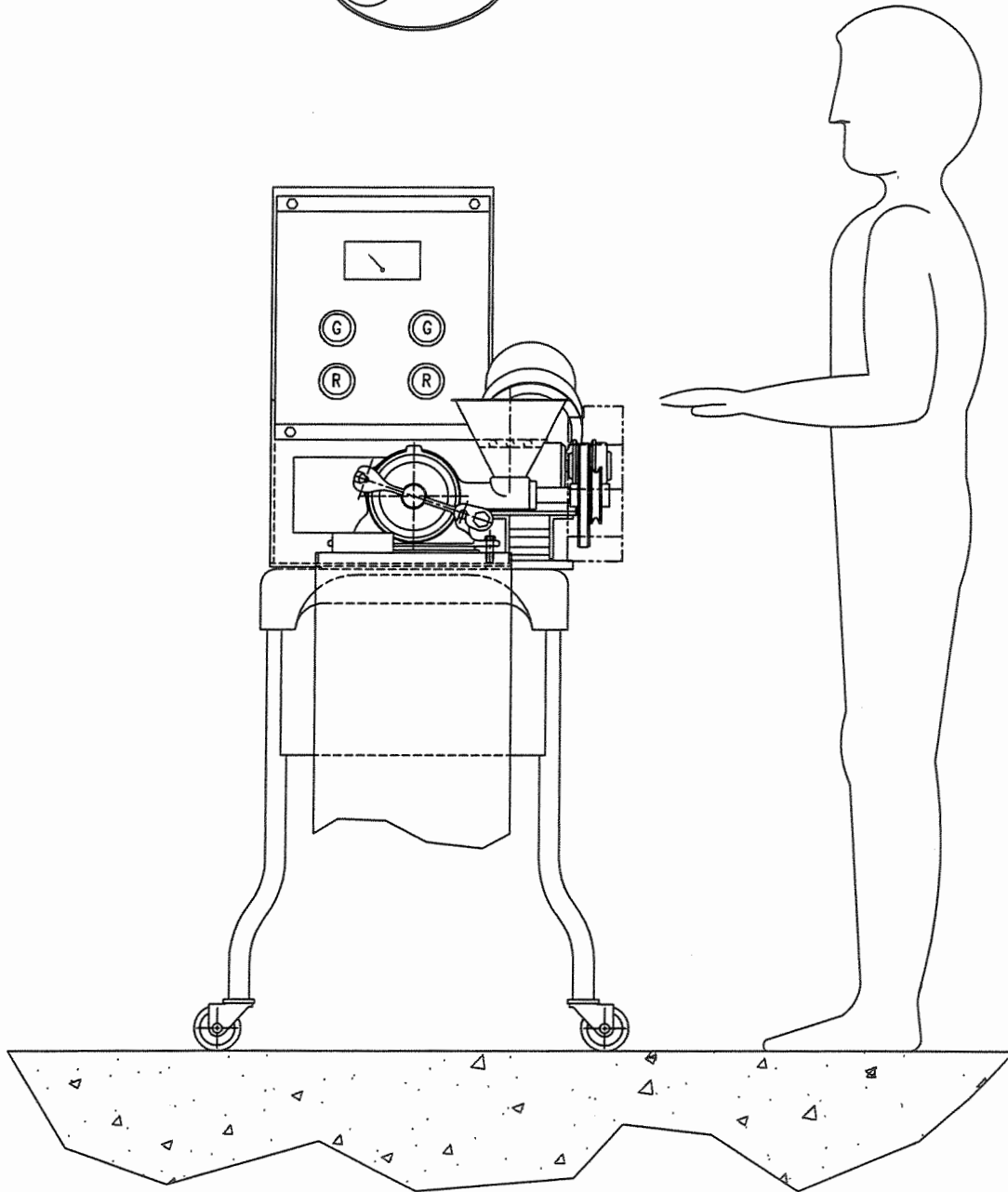
SECTION II

SAFETY

2-1	GENERAL	PG. II-1
2-2	EQUIPMENT SAFETY FEATURES	PG. II-2
2-3	WARNING SIGNS	PG. II-3



← This unit is top heavy!!
Push from side shown only.



Bantam Rolling Safety Precaution

2-1.- GENERAL

NOTE: Before installing, operating, or maintaining this equipment, carefully read this Manual and the following Safety Recommendations.

- Follow all plant Working Rules and use recommended Safety Equipment.
- Read the Owner's Manual.
- The area around the Mill is dusty. Use a suitable respirator per plant policy and OSHA recommendations.
- While working around the Mill, steel toe safety shoes and safety goggles or safety glasses with side shields must be worn at all times.
- The Mill produces a noise level somewhat higher than the acceptable limit of 85 dba at 1 meter from the noise source. OSHA approved ear protection must be worn while working around the Mill.
- Keep hands and clothing clear of the Feed Hopper, Mill openings, Air inlets or any moving parts.
- To eliminate the possibility of sparking occurring within the Mill, all metallic scrap must be separated from the feed material before it enters the grinding chamber.
- Be sure the Mill is electrically grounded.
- The motors must be permanently wired to an approved NEMA enclosure, in accordance with all local codes and the National Electric Code.
- Before the Mill is opened for inspection or repairs, make sure the main power is disconnected and the switch is locked out.

- When operating the Mill, all safety guards must be in place.
- Should abnormal levels of vibration or noise develop, immediately shut off the equipment, investigate the problem and do not re-start the unit until the problem has been corrected. Contact the MPS Service Department for assistance.

2-2.- EQUIPMENT SAFETY FEATURES:

The HAMMER MILL incorporates the following safety features:

- **Fabrication:**

Our Mills are designed and built with safety in mind. All materials used have been carefully selected. All our Mills are inspected by our Quality Control personnel during fabrication and assembly.

- **Housing Cover Limit Switch:**

This Switch is interlocked with the Main Drive so that the main motor cannot run if the Cover is not in place.

- **Electric Interlock Between Motors:**

The Main Drive Motor and Feed Screw Motor are interlocked so that the Feed Screw Motor cannot be started unless the Main Drive Motor is running.

- **V-Belt Guards:**

All V-Belt Drives are protected with OSHA approved guards.

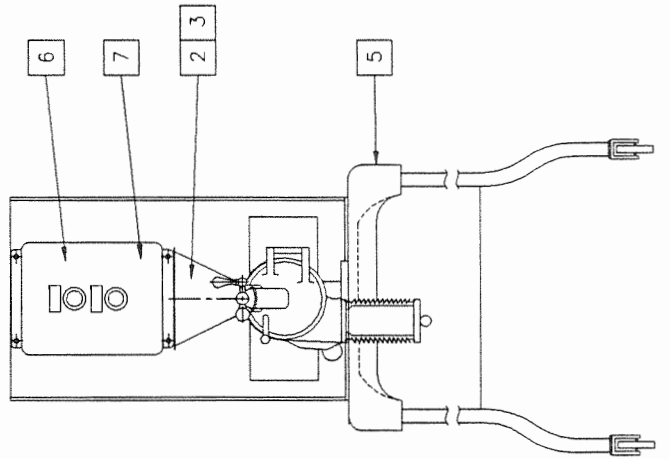
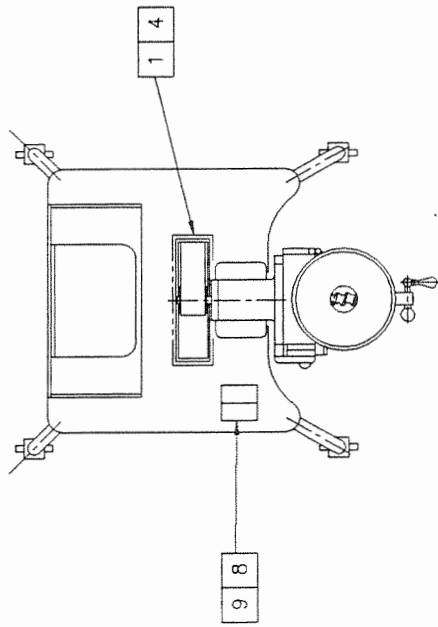
- **Moving Parts:**

All moving parts are enclosed.

2-3.- WARNING LABELS:

The following drawings identify potential hazards.

THIS DRAWING IS THE PROPERTY OF MICRON POWDER SYSTEMS, INC. IT IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF MICRON POWDER SYSTEMS, INC.



NOTES:
 1. LABELS AS INDICATED ARE TO BE PLACED IN THE MOUNTING POSITION SHOWN.
 2. VISIBILITY IS A CRITICAL FACTOR WHEN POSITIONING LABELS. LABEL POSITIONING IS TO BE DETERMINED AT ASSEMBLY.

ITEM NO.	QTY	PART NO.	DESCRIPTION	WT.
9	1	261557	EQUIPMENT NAME TAG	
8	1	261567	GENERIC NAME PLATE	
7	1	261634	POWER DISCONNECT LABEL	
6	1	261636	ELECTRICAL HAZARD LABEL	
5	1	261571	MPS IDENTIFICATION LABEL	
4	1	261632	GENERIC EQUIPMENT LABEL	
3	1	261633	SAFETY LABEL	
2	1	261635	EYE PROTECTION LABEL	
1	1	261630	WATCH HANDS LABEL	

BILL OF MATERIAL	
ITEM NO.	DESCRIPTION
1	GENERIC NAME PLATE
2	POWER DISCONNECT LABEL
3	ELECTRICAL HAZARD LABEL
4	MPS IDENTIFICATION LABEL
5	GENERIC EQUIPMENT LABEL
6	SAFETY LABEL
7	EYE PROTECTION LABEL
8	WATCH HANDS LABEL

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MICRON POWDER SYSTEMS
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 WASHINGTON, PA. 15360-1000
 TEL: 724-837-1000
 FAX: 724-837-1001
 E-MAIL: SALES@MPS.COM
 WWW: WWW.MPS.COM

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SECTION III

EQUIPMENT DESCRIPTION

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3-2	PULVERIZER	PG. III-1
3-3	PULVERIZER DRIVE	PG. III-2
3-4	PULVERIZER SUPPORT	PG. III-2
3-5	ELECTRIC CONTROLS	PG. III-3
3-6	EQUIPMENT DATA	PG. III-4

3-1.- FEED SYSTEM

(Refer to Drawings #621966-M1)

The Mikro-Pulverizer FEED SYSTEM consists of the following items:

- A 316 Stainless Steel HOPPER (A) with a capacity of .025 cu. ft., (with the addition of an extended feed hopper, capacities range from .025 to 2.5 cu. ft.). Hopper (A) is attached to Feed Screw Mechanism (B).
- The Bantam Feed Screw Mechanism (B) is a single screw conveyor consisting of Motor (C), driving Gear Reducer (D), Adjustable Speed Drive (E), and one Screw (F). The Samplmill Feed Screw Mechanism is operated by Hand Crank (Z).

3-2.- PULVERIZER

(Refer to Drawings #621966-M1)

The PULVERIZER itself consists of the following items:

- Pulverizer Assembly consists of a Main Body (H), a Cover (N), a Rotor Assembly (I), and Hammers (J).

The interior of the Main Body (H) grinding chamber is covered by one or two piece Liners (O) and a Screen (K), supported by a Screen Backing (R).

The bottom of Main Body (H) is open to discharge the pulverized material into a small container or canister.

The Air Relief Elbow (L) located on the side of the Main Body (H) is used to relieve the air flow produced by the rotation of Rotor (I). The Air Relief Elbow (L) is typically connected to a Air Relief Bag which traps the fine dust generated during the grinding process.

There is one Air Inlet Control Gate (M) on the Cover (N), with an adjustable opening to let air in and to reduce any vacuum at the Feed Screw (F) caused by fan action of the Rotor (I).

The front side of the Main Body (H) surface is machined to receive Cover (N). The Cover (N) of the Bantam™ is held in place by Clamp Assembly (Q). The Clamp Assembly (Q) incorporates a keeper plate which is also used as a wrench to loosen the Rotor Shaft Nut. The Samplmill™ Main Body and Feed Screw Housing is a one piece cast unit which is hinged and bolted to the Bearing Housing (P).

The Rotor Assembly (I) shaft is support by two Bearings in the Pillow Block Housing (P).

3-3.- PULVERIZER DRIVE:

(Refer to Drawings #621966-M1)

The BANTAM/SAMPLMILL DRIVE consists of the following items:

The Driven Sheave (S) is mounted on the Rotor Shaft. The Driven Sheave (S) is connected by Flat Belt (U) to the Drive Sheave (T), which is mounted on the Motor (V) shaft. Motor (V) is mounted on a hinged frame so that part of the motor is weight is used to produce the necessary tension on the Flat Belt (U). The Flat Belt Drive is covered by a Safety Guard (W).

3-4.- PULVERIZER SUPPORT:

(Refer to Drawings #621966-M1)

The PULVERIZER SUPPORT consists of the following items:

- **Structural Mill Base:**

Feed Screw Mechanism (B), Main Body (H), and both Drives are bolted to a common Structure (X).

- **Supporting Legs:**

Base (X) is welded to four tubular Legs (Y) which support the mill. These legs (Y) are provided with casters.

3-5.- ELECTRIC CONTROLS:

(Refer to suggested Wiring Diagram on next page)

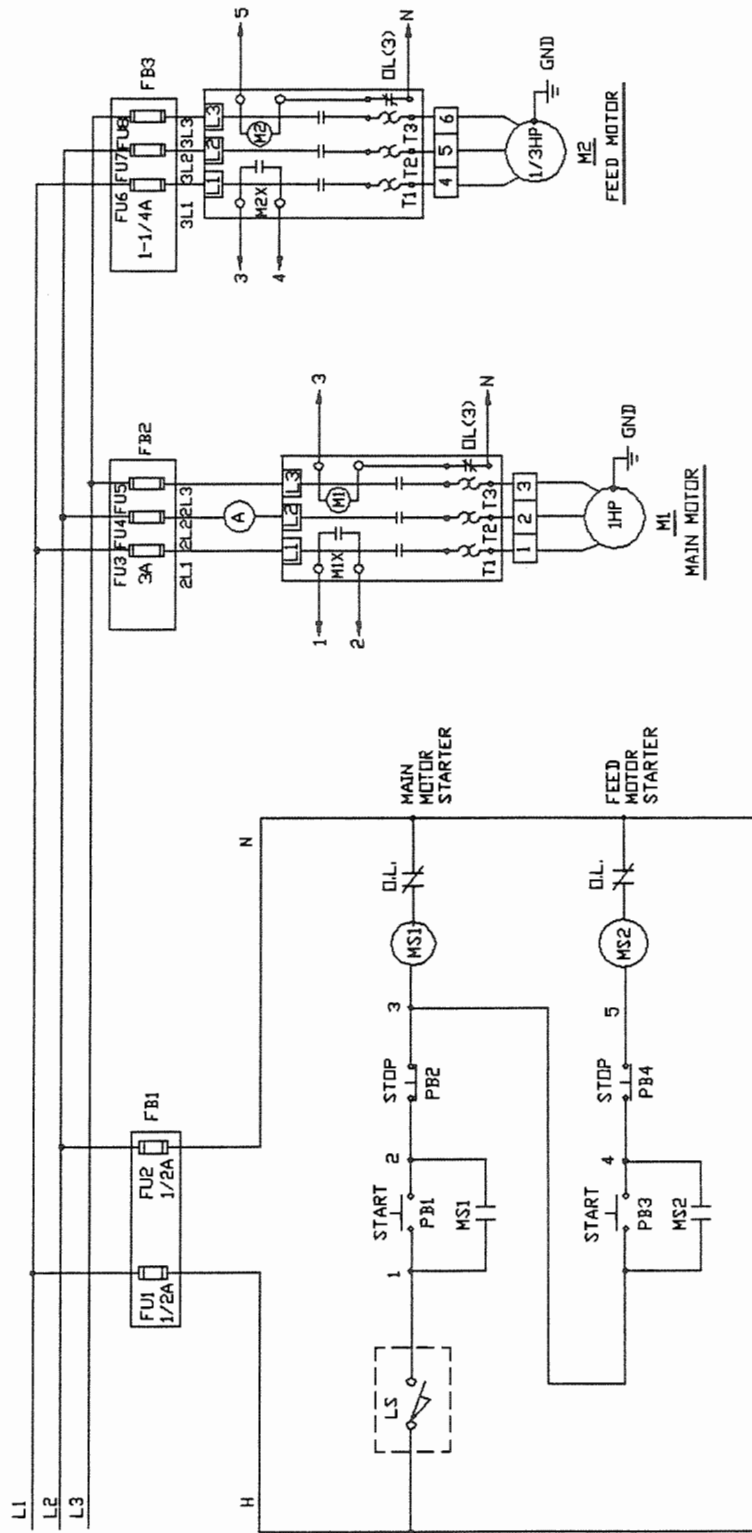
MICRON POWDER SYSTEMS normally supplies the following controls for the BANTAM Mikro-Pulverizer:

- 1. Push-buttons type starters for the main drive motor and feed screw mechanism motor.**
- 2. A limit switch for the housing cover.**
- 3. An ammeter for the main drive motor.**
- 4. All interconnecting wiring.**

The two motors are interlocked so that the feed screw cannot operate unless the main drive is running. The limit switch is provided to prevent the operation of the mill when the cover is not properly closed. The ammeter is provided to display the amperage drawn by the main drive motor. This reading gives the operator an indication of the main drive motor loading and should be used to adjust the feed rate appropriately.

The SAMPLMILL is not supplied with an ammeter and has only one starter for the main drive motor. (Feed Screw Mechanism is operated manually.)

If the customer elects to supply his own electric controls, they should be configured in the same manner. (See typical wiring diagram).



LEGEND

FU-FUSE
LS-LIMIT SWITCH
PB-PUSH BUTTON
O.L.-OVERLOAD
M-MOTOR
MS-MOTOR STARTER
A-AMMETER

**BANTAM
TYPICAL WIRING DIAGRAM
(FOR REFERENCE ONLY)**

NOTE ALL FUSES TO BE SIZED
ACCORDING TO NEC

3-6.- EQUIPMENT DATA:

DESIGN DATA:

	<u>Bantam</u>	<u>Samplmill</u>
MAIN DRIVE.....	1 HP	3/4 HP
ROTOR MAXIMUM SPEED.....	14,000 rpm	14,000 rpm
ROTOR MINIMUM SPEED.....	3,450 rpm	No Min.*
POWER REQUIREMENTS.....	Per Specs	Per Specs
WEIGHT (APPROX.).....	300 lbs	300 lbs
FLOOR AREA REQUIRED.....	9 sq. ft. (36" x 36")	9 sq. ft. (36" x 36")

*With stamped rotor.

SECTION IV

INSTALLATION

4-1 FLOOR REQUIREMENTS	PG. IV-1
4-2 CLEARANCE REQUIREMENTS	PG. IV-1
4-3 UNLOADING EQUIPMENT	
4-3.1 Crates and Equipment Inspection	PG. IV-1
4-3.2 Unloading	PG. IV-2
4-4 ASSEMBLY INSTRUCTIONS	PG. IV-2
4-5 INITIAL LUBRICATION	PG. IV-3

4-1.- FLOOR REQUIREMENTS:

(Refer to drawing #621966-M)

The static load carried by the four Supporting Legs is 300 lbs.

The floor or foundations where the mill is to be located must be level. The floor should be reinforced concrete on firm soil base.

4-2.- CLEARANCE REQUIREMENTS:

There should be a minimum of two feet of clearance on all four sides of the mill, however since the mill is mounted on caster wheels, it can be moved easily for routine maintenance. Consideration must be given to the placement of the mill so that the receiving canisters can be changed without difficulty.

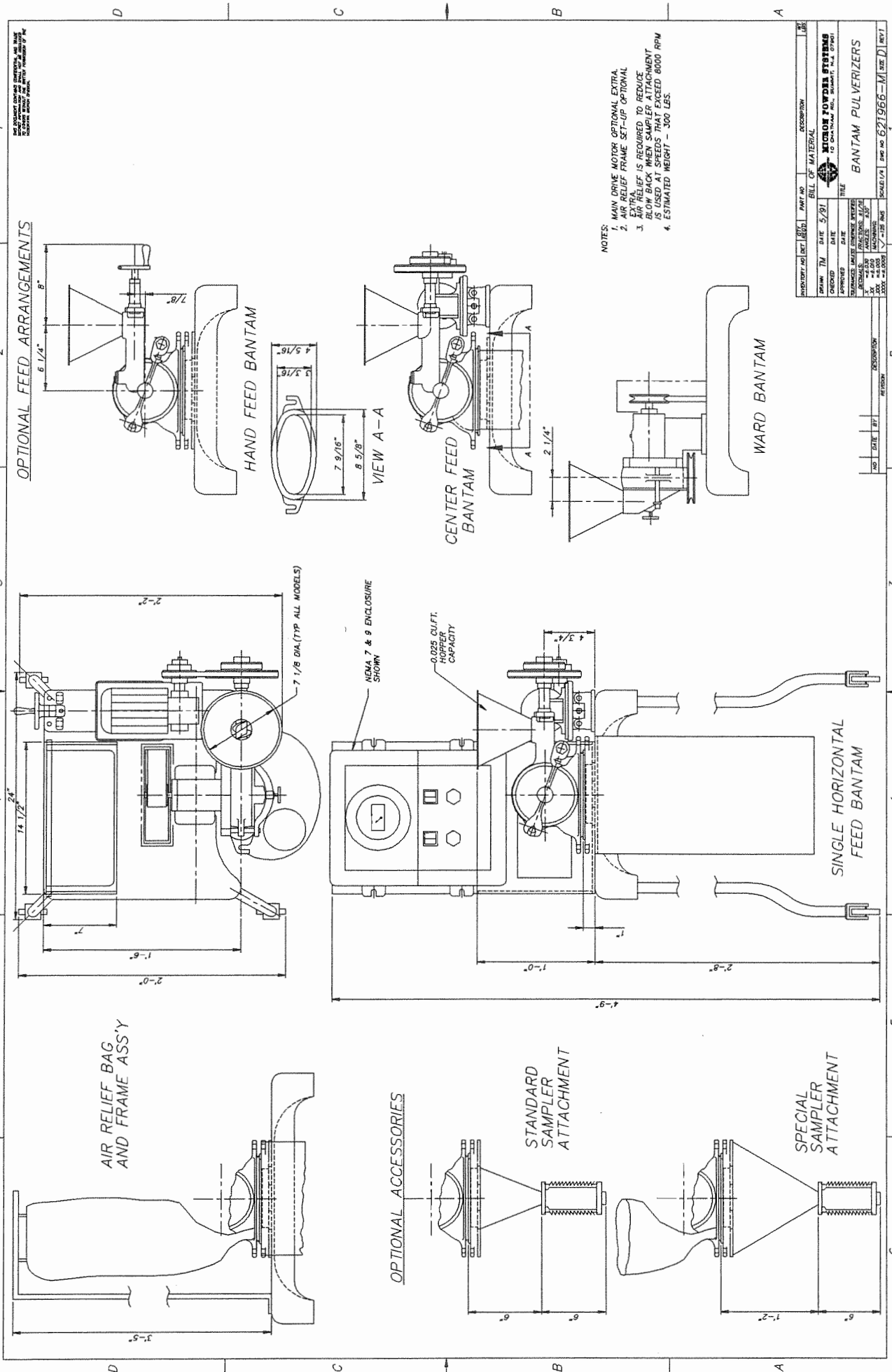
4-3.- UNLOADING EQUIPMENT:

4-3.1 CRATES AND EQUIPMENT INSPECTION:

Inspect the crate visually before opening it to identify any damage during transportation.

Inspect the appearance of all painted items.

Check for hardware that may have loosened during transport. Tighten any loose hardware.



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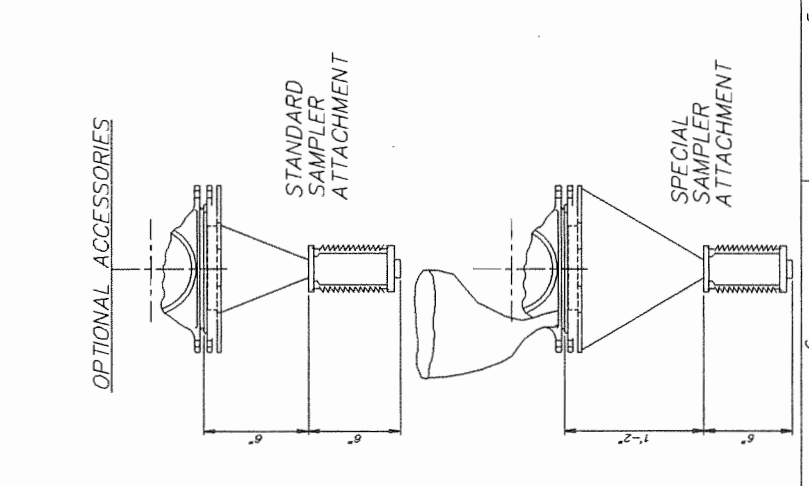
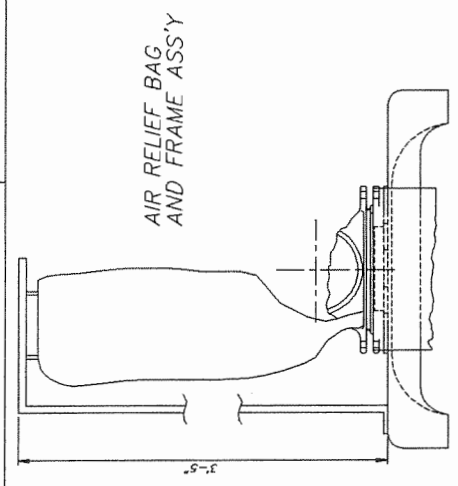
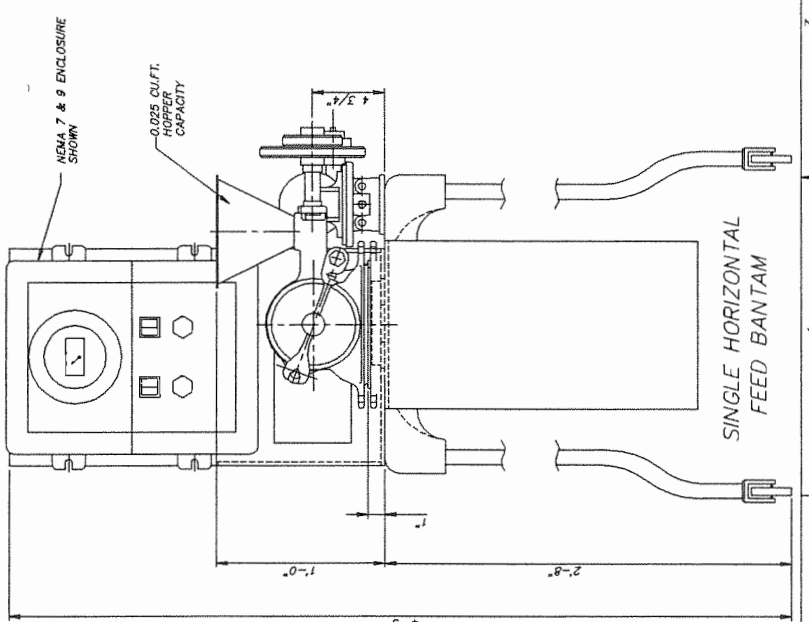
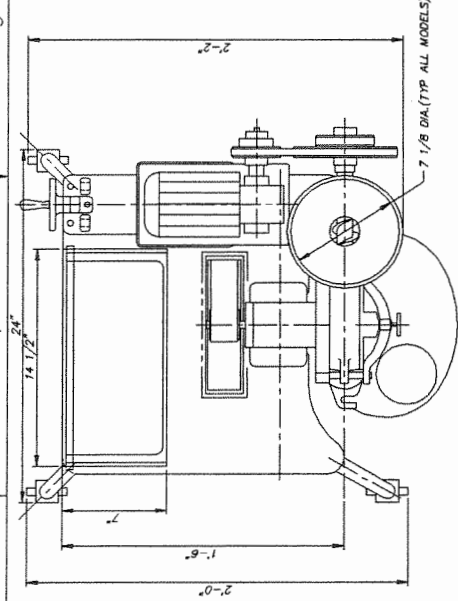
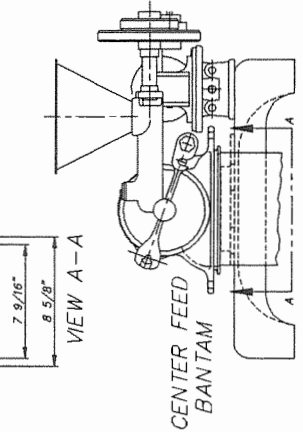
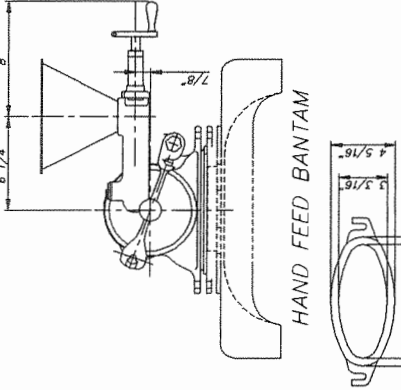
- NOTES:
1. MAIN DRIVE MOTOR, OPTIONAL EXTRA.
 2. AIR RELIEF FRAME, SET-UP OPTIONAL EXTRA.
 3. AIR RELIEF IS REQUIRED TO REDUCE BLOW BACK WHEN SAMPLER ATTACHMENT USED AT SPEEDS EXCEEDING 6000 RPM.
 4. ESTIMATED WEIGHT - 300 LBS.

PROJECT NO. 101	REV. 1	DATE 5/31	BY J. H. HARRIS	APPROVED
BILL OF MATERIAL				
MICROMETALS CORPORATION				
BANTAM PULVERIZERS				
SCALE 1/4" = 1" (SEE D) (REV 1)				

OPTIONAL FEED ARRANGEMENTS

AIR RELIEF BAG AND FRAME ASSY

OPTIONAL ACCESSORIES



4-3.2 UNLOADING:

Use a 0.5 Ton (1,000 lb) capacity hoist for unloading the Pulverizer.

NOTES: 1.- DO NOT USE THE CLAMP ASSEMBLY TO LIFT THE PULVERIZER.

2.- DO NOT BOUNCE OR HIT ASSEMBLY DURING LIFTING.

4-4.- ASSEMBLY INSTRUCTIONS:

NOTES: - For assembly instructions refer also to Section III, "EQUIPMENT DESCRIPTION"

- Check Foundation level.
- The Pulverizer has been completed assembled at the factory.
- Roll the mill to its operating location.
- Rotate Rotor by hand to make sure it rotates freely. If Rotor is not free to rotate, refer to Section VI "Maintenance" Par 6-3.2 for detailed assembly of Rotor.
- Connect power source.
- Check all lubrication points for proper lubrication. Refer to Section IV, par. 6-1 "Preventive Maintenance" for instructions and lubricant specifications.

- Make sure that the machine is clear of all foreign objects and that all the bolts are properly tightened.
- Switch power ON.
- Jog Pulverizer to check direction of rotation (See Fig. 1, Section I). Change Rotation if it is not correct.
- Jog Feed Screw Mechanism Motor and check for correct rotation.
- Install Air Relief Bag.
- Install Receiving Container or Outlet Bag.
- Verify that the Safety Limit Switch operates properly (See par. 3-5). **DO NOT verify the limit switch operation by running the mill, but check it according to the following procedure:**
Lock out the main power to the mill. When the mill cover is properly closed, use a multimeter to measure continuity across the limit switch terminals located in the control box. Open the mill cover slightly and verify that you can no longer measure continuity across the terminals.
- Run Pulverizer empty for 1/2 hour to check bearing temperature (see par. 6-1.2), and listen for any unusual noise or vibration. Stop and start Motor periodically (every 10-15 min.). Verify that the Feed Screw Motor interlock operates properly. (See par. 3-5).
- After the run-in period, re-check all bolts and fasteners for tightness.

4-5.- INITIAL LUBRICATION:

The equipment is fully lubricated prior to testing at the factory, however, after installation, all the lubrication points should be checked (Feed Screw Mechanism Bushings, and the Mill Bearing Housing).

For oil and grease recommendations, see Section VI "Preventive Maintenance", (par. 6-1.1 and 6-1.2) of this Manual.

SECTION V

START UP

5-1 PRECAUTIONS BEFORE START UP	PG. V-1
5-2 START UP	PG. V-2
5-3 SHUTDOWN	PG. V-2
5-4 EMERGENCY SHUTDOWN	PG. V-3
5-5 POWER FAILURE	PG. V-3

5-1.- PRECAUTIONS BEFORE START-UP:

Before starting up after the Run-In period, make sure that:

- All bolts are properly tightened
- The Housing Cover is properly closed. Do not use excessive force on the Cover Clamp Assembly. Hand tight clamping will provide an adequate seal.
- The Housing Cover Safety Limit Switch works properly. (See page IV-3, par. 4-4)

- Electrical interlock between Main Motor and Feed Screw Motor works properly. (Applies to the Bantam Mill only.)
- Lubrication levels have been checked.
- The Air Inlet Control Gates are half open. (Adjust them as required during operation).
- No tools have been left around the machine and drives.
- The Safety Guards are in place.
- The vent port is connected to Air Relief Bag, if provided. Check that the Receiving container is in place.
- The operators are using all the safety equipment required and are following all plant safety rules and regulations. (See Section II "Safety", for required safety equipment).
- Operators have been properly trained in the operation of the Hammer Mill.

5-2.- START-UP:

The actual Start-up (and Operation) of the Pulverizer is very simple, and requires normal attention by the operator.

To start a grinding cycle:

- Start the Pulverizer Motor by pushing the START Push-button for the Main Motor Starter.
- Note idle load amperage.
- Adjust feed screw to slowest rate.
- Feed raw material into the Hopper.
- Start feeding material into the Pulverizer by pushing the Feed Screw Motor Starter START Push-button. For the Samplmill rotate the Feeding Screw hand crank clockwise.
- Adjust feed rate according to Main Motor load (Ammeter reading at Control Panel), by changing Feed Screw speed.
Recommended Maximum feed rate is determined by monitoring the Ammeter. Do not exceed 95% of maximum name plate amperage for main drive motor.
- Stop system as required to change Receiving Container and/or Air Relief Bag. **Follow Shut-Down Procedure.**

5-3.- SHUT-DOWN:

At the end of the grinding cycle or at any time during the operation, the pulverizer can be stopped using the following procedure:

- Stop feeding the Pulverizer (In the case of The Bantam Mill, by pushing the STOP push-button of the Feed Screw Motor.
- Continue to run the Pulverizer until it is empty.
- When the Main Motor Ammeter reads "idle load", stop the Pulverizer by pushing the STOP push-button of the Main Motor.

- Make sure that the Pulverizer comes to a complete stop before attempting to do anything.
- After changing Container or Air Relief Bag, the Pulverizer can be started again, by following the above start-up procedure (Par. 5-2).

5-4.- EMERGENCY SHUT-DOWN:

In case of emergency push the STOP push-button at the Main Motor Starter.

CAUTION:

Before opening the Mill, make sure that the Main Power Switch is disconnected, properly tagged out and locked out or that the power cord is unplugged.

When the emergency condition is over, open the Mill and remove the material in the Rotor area, to make sure the Rotor is free to rotate. After the grinding chamber is empty, re-start the Pulverizer by following the Start-up procedure (Par 5-2).

5-5.- POWER FAILURE:

If there is a power failure while the Pulverizer is operating, the Main Motor and Feed Screw Motor will stop, and they will not re-start by themselves when the power is restored. Before attempting to re-start the Main Motor, the Pulverizer Rotor area must be completely cleaned.

CAUTION:

Before opening the Mill, make sure that the Main Power Switch is disconnected, properly tagged out and locked out or that the power cord is unplugged.

After removing all the material in the grinding chamber, re-start the Pulverizer by following the Start-up procedure (Par. 5-2).

SECTION VI

MAINTENANCE

6-1 PREVENTIVE MAINTENANCE	PG. VI-1
6-1.1 Lubrication	PG. VI-1
6-1.2 Daily Preventive Maintenance	PG. VI-2
6-2 VIBRATION LIMITS	PG. VI-2
6-3 ASSEMBLY INSTRUCTIONS	
6-3.1 Changing Screens & Liners	PG. VI-2
6-3.2 Changing Rotor and Hammers	PG. VI-3
6-3.3 Changing Feed Screw	PG. VI-4
6-3.4 Changing Bearings	PG. VI-5
6-3.5 Changing Drive Belts	PG. VI-6
6-4 TROUBLESHOOTING	PG. VI-7

6-1.- PREVENTIVE MAINTENANCE:

Maintenance of The BANTAM™ and SAMPLMILL™ is very simple and only requires a small amount of planned maintenance time.

6-1.1 LUBRICATION:

Refer to "Lubrication Chart" and "Lubrication Graph" in this SECTION.

- Pulverizer Drive Motor:

Follow recommendations of Motor Manufacturer.

- Pulverizer Bearing Housing:

The Bearing Housing supplied with an OIL SIGHT GLASS to observe the oil level in the reservoir between the two bearings. The oil level should be maintained at the line marked in the glass when the mill is NOT running. Note: Make sure the machine is properly leveled, so that both bearings are properly lubricated. Oil should never be added while the unit is running. The proper oil level in the reservoir can only be determined when the machine is stopped.

The oil in the Bearing Housing should be changed once a month. Drain the oil through the drain plug located at the side of the Bearing Housing and refill through the fill plug located at the top.

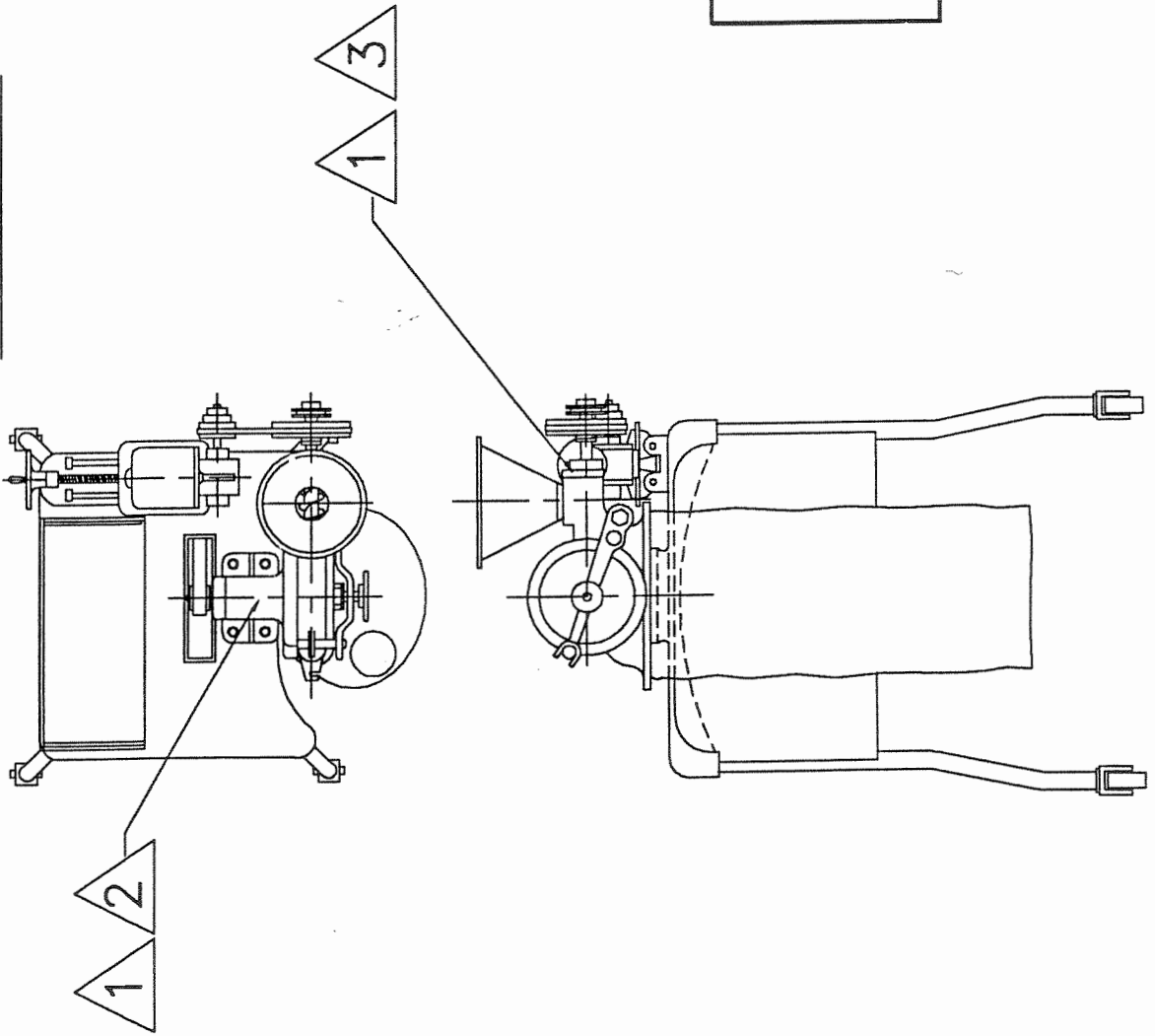
Recommended oil: SAE-20 grade, non foaming, non detergent oil (See chart for industrial grade oils of equivalent viscosity).

- Feed System:

Every week put one or two drops of oil in the spring cover oil cup of the Feed Screw Bearing Housing. Remove Screw Shaft yearly to clean oil build up and to check the conditions of parts.

Recommended oil: SAE-20 grade, non foaming, non detergent oil (See Chart for industrial grade oils of equivalent viscosity).

LUBRICATION GRAPH



- △ 1 EVERY WEEK (REPLENISH)
- △ 2 EVERY MONTH (CHANGE)
- △ 3 EVERY YEAR (CLEAN)

PILLOW BLOCK LUBRICATION

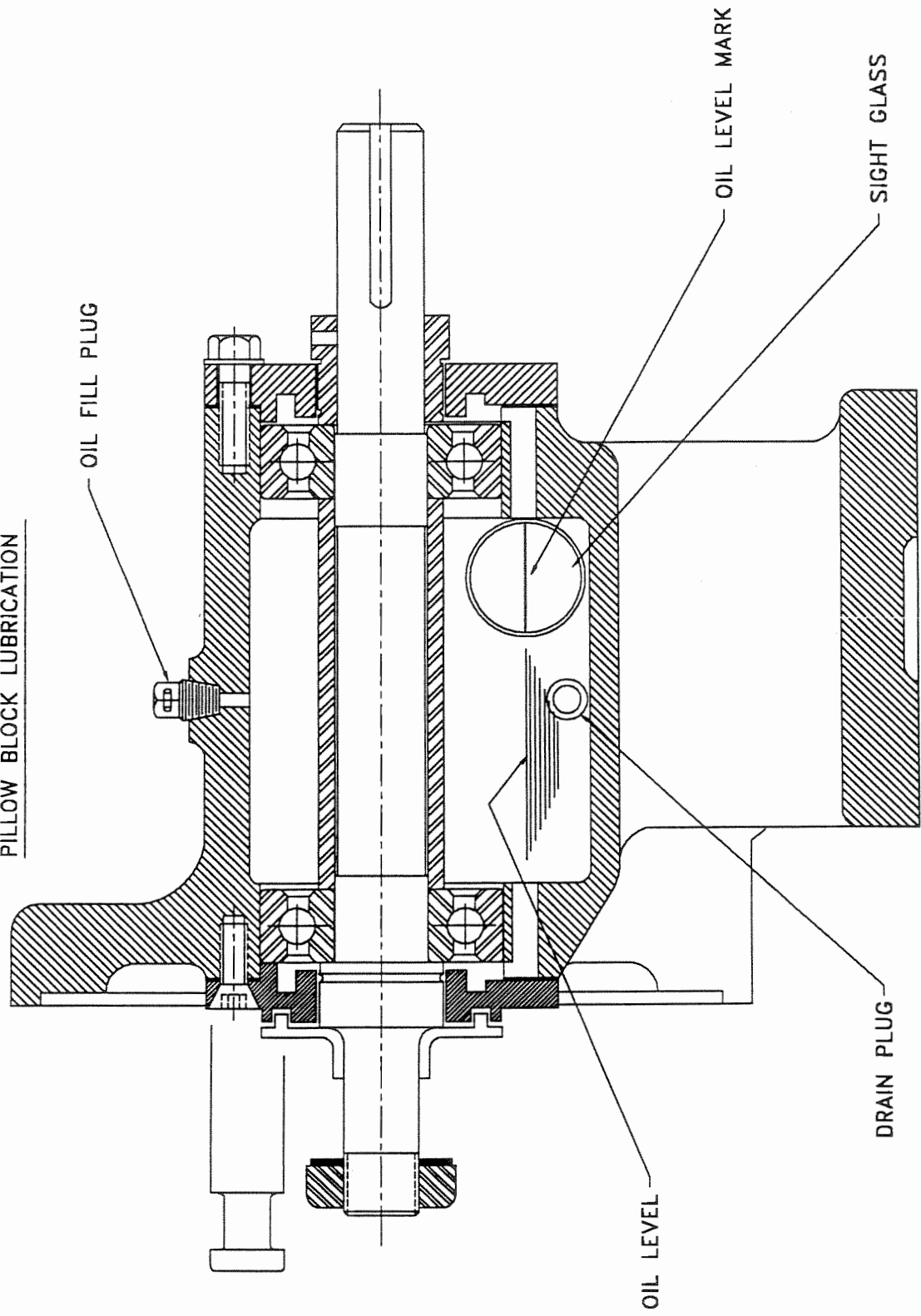


FIG. 3

6-1.2 DAILY PREVENTIVE MAINTENANCE:

Check Rotor Bearing Housing for any unusual temperature change. After the mill has run for one hour under load, carefully touch the Bearing Housing. If you cannot hold your hand to it, the bearings are too hot (over 140°F) and requires attention.

While the unit is running under load, listen for any unusual noise. (DO NOT remove your ear plugs). If you hear any unusual noise or vibration, notify your supervisor immediately.

6-2.- VIBRATION:

VIBRATION LIMITS:

Following are Vibration Velocity Limits (in/sec), under no load conditions:

- 0.15 in/sec or less is NORMAL.
- 0.15 to 0.40 in/sec - Identify and correct source of vibration.
- Greater than 0.40 in/sec - Shut down Mill. DO NOT run until source of vibration is corrected.

6-3.- ASSEMBLY INSTRUCTIONS:

6-3.1 CHANGING SCREENS AND LINERS:

- Stop feeding the Pulverizer. Keep the Mill running until the grinding chamber is empty.
- Stop Main Motor.
- Disconnect Main Power Switch, lock it out, and tag it out or unplug power cord.
- Remove Housing Cover by loosening the Cover Clamp Assembly. For the Samplmill, loosen the Cover Clamp and rotate the body cover and feed trough to expose the grinding chamber.

- Remove the Screen, the Screen Backing and the two sections of Liners, from the Bantam Body.
- Before installing a new Screen and/or new Liners, clean the grinding chamber of the mill.
- Slide the Screen Backing and the new Screen in place.
- Install the two sections of Liners. Make sure that the groove of each Liner is positioned at the corresponding dowel pin.
- Clean the two mating surfaces of the Body, and make sure the dust gasket is in good condition. Replace the gasket if necessary.
- Install the Body with new liners or screen.
- Install the Drive Belt and adjust Motor position.
- Install the guard.
- Close the cover. Check that the Cover Clamp is properly tightened.
- Rotate Rotor by hand to make sure it rotates freely.
- Connect Power and/or power cord and start the unit.

6-3.2 CHANGING ROTOR AND HAMMERS:

NOTE: Worn hammers can significantly reduce output capacity. A spare set of hammers should be kept on hand in the event an unscheduled replacement is required.

- Stop feeding the Pulverizer but keep the Mill running until the grinding chamber is empty.
- Stop Main Motor.
- Disconnect Main Power Switch, lock it out, and tag it out or unplug the power cord.
- Remove the Cover by loosening the Cover Clamp Assembly and open the Cover as per par. 6-3.1, to expose the Rotor.
- Remove the Rotor Nut with the Clamp Wrench provided and remove the fiber washer.
- Remove the Rotor assembly (or one piece Stamped Rotor of Samplmill).

- To replace T-Head hammers, separate the Rotor Discs, to remove old hammers.
- Reassemble the rotor assembly with new hammers.
Note: Make sure that the new hammers are installed so that the flat face of the hammer impacts the feed as it enters the grinding chamber and propels it up toward the liner. When hammers show signs of wear, replace the complete set. Mixing new and worn hammers will cause the rotor to be unbalanced and may cause damage to component parts.
- Reinstall the Rotor on the bearing shaft with the pointed end of the king pins facing the locking nut.
- Install the fiber washer and rotor nut.
Note: Never replace individual hammers. Always use complete sets.
- Check that the Rotor rotates freely, and close the mill.

6-3.3 CHANGING FEED SCREW:

FOR THE BANTAM MILL:

- Stop feeding the Pulverizer, but keep the Mill running until the grinding chamber is empty.
- Stop Main Motor.
- Disconnect Main Power Switch, lock it out, and tag it out or unplug the power cord.
- Remove the Feed Screw Guard.
- Loosen the Feed Screw Belt and remove it.
- Loosen the bolts holding the Feed Screw Housing to the Main Body.
- Remove the Feed Screw Housing and the Screw assembly by rotating the Screw Assembly and pulling it out of the Housing.
- Remove the Driven Pulley and the Feed Screw Retaining Collar.
- Remove the Screw and inspect the Bronze Bushings. Replace them if necessary.
- Before installing new Feeder, clean base pads.
- Reverse the above procedure for installing New Feed Screw.

FOR SAMPLMILL:

- Stop and disconnect the power as indicated above for the Bantam.
- Loosen Socket Head/Cap Screw holding the Screw Assembly to the Main Body Cover.
- Remove the Feed Screw Assembly by pulling it out of the Main Body Cover.
- Reverse the above procedure for installing New Feed Screw.

6-3.4 CHANGING BEARINGS:

- Stop feeding the Pulverizer but keep the Mill running until the grinding chamber is empty.
- Stop Main Motor.
- Disconnect Main Power Switch, lock it out, and tag it out or unplug the power cord.
- Remove the Main Motor Belt Guard and remove the Drive Belt by lifting the Main Motor (Hinged base).
- Remove the Driven Pulley from the Rotor Shaft.
- Remove the Rotor Assembly as indicated under par. 6-3.2.
- Drain the oil from the Bearing Housing reservoir.
- Remove the 4 Bolts of the End Cover (Drive side) and remove the End Cover.
- Remove the four bolts from the rotor end cover.
- The entire Shaft and Bearing Assembly may now be withdrawn as a unit.
- The Flinger (Drive end), the Drive End Ball Bearing, the Bearing Spacer and the Rotor End Ball Bearing may be removed from the shaft. Inspect all the components carefully, including all gaskets, and replace parts as required.
- Flush the Bearing Housing reservoir to remove any foreign matter.
- Reverse the above procedure to reinstall the Shaft and Bearing Assembly.
- Fill Bearing Housing oil reservoir with clean oil to the mark on the Sight Glass, per instructions in par 6-1.1.

6-3.5 CHANGING DRIVE BELTS:

- Stop feeding the Pulverizer. Keep the Mill running until the grinding is empty.
- Stop Main Motor.
- Disconnect Main Power Switch, lock it out, and tag it out or unplug the power cord.
- Remove the Flat Belt Guard.
- Loosen the Belts by lifting the Main Motor (Hinged frame).
- Remove the Flat Belt and install a new one.
- Install the Guard.

TROUBLESHOOTING CHART

SYSTEM: The Bantam

Equipment Section	Symptoms	Possible Cause	Remedy
MILL	Mill stops - Starter heaters overload	a.- Feed rate too high b.- Rotation backwards c.- Foreign object jamming rotor d.- Screen is blinding Material stays on screen	Reduce feeder speed Reverse rotation Remove object See following symptom
	Screen is blinding	a.- Material is too sticky b.- Material is softening c.- Screen perforations small d.- Insufficient air thru mill	Reduce stickiness of feed material Contact MPS Service Dept. Use larger hole or Herringbone Screen Open air inlet
	Material is blowing out of the mill	a.- Air inlet and/or exhaust are closed b.- Cover not seated c.- Incorrect rotation d.- Screen has blinded condition e.- Discharge bag or chute is full or plugged	Open intake and/or exhaust Clear obstruction and secure cover Reverse rotation See above symptom Turn off machine and empty bag or unplug chute/hopper

Note: Use an air relief bag for rotor speeds greater than 8,000 RPM.

TROUBLESHOOTING CHART

SYSTEM: The Bantam

PAGE: 2 OF 3

Equipment Section	Symptoms	Possible Cause	Remedy
MILL	Premature bearing failure	a.- Improper lubrication b.- Improper oil level	Provide specified oil Keep oil to specified level
		c.- Wrong bearing d.- Rotor Imbalance	Procure correct bearing Balance rotor
		e.- Improper hammer installation f.- Heavy and/or inconsistent feed material	Install hammers per instructions Adjust feed mechanism to deliver material at a slower rate
	Change in product particle size	a.- Feed material has changed (in composition or size) b.- Worn or damaged screen c.- Worn hammers d.- Worn liner	Adjust feeder Replace screen Replace hammers Replace liner
	Motor load fluctuating	a.- Feed rate varying b.- Inconsistent feed material	1. Check feed supply 2. Check feeder operation Adjust preparation of feed material

TROUBLESHOOTING CHART

SYSTEM: The Bantam

PAGE: 3 OF 3

Equipment Section	Symptoms	Possible Cause	Remedy
MILL	Reduced capacity	a.- Worn hammers b.- Worn liner	Replace with new set Replace with new liner
		c.- Reduced rotor speed	Check drive for worn or loose drive belts. Replace belt.
		d.- Feed rate too slow	Increase feed screw speed to max. 95% of motor full load (See Section 5-2)
FEED SCREW	Feed screw jam	a.- Foreign object in feed screw b.- Feed material is packing	Clear object from feed screws Feed material wet
	Feeds too fast	Too much suction at feed end	Open air intake and adjust as required
NOTE: FOR ANY PROBLEMS NOT IDENTIFIED HERE, PLEASE CONTACT MPS SERVICE DEPARTMENT (908) 277-9277			

SECTION VII

PARTS LIST

BANTAM

MILL TYPES

BEARING HOUSING

T-HAMMER ROTOR

FEED SCREW

BILL OF MATERIAL

SAMPLMILL

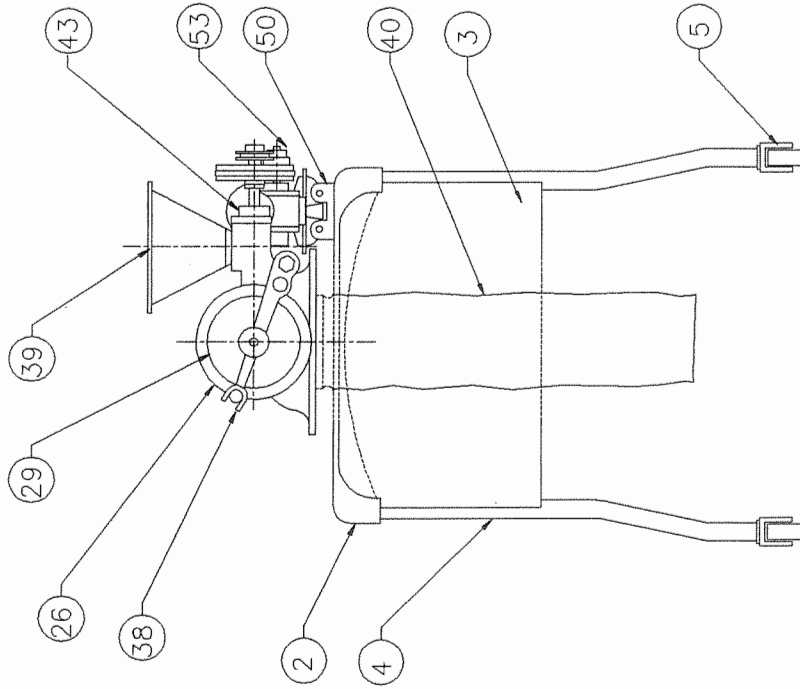
MILL ASSEMBLY

STAMPED ROTOR

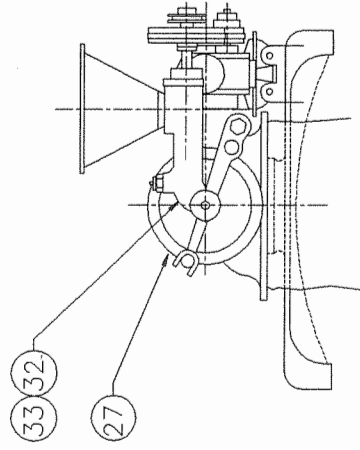
BILL OF MATERIAL

AND

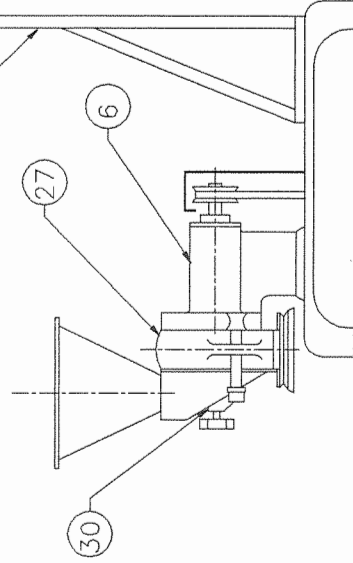
SPARE PARTS LIST



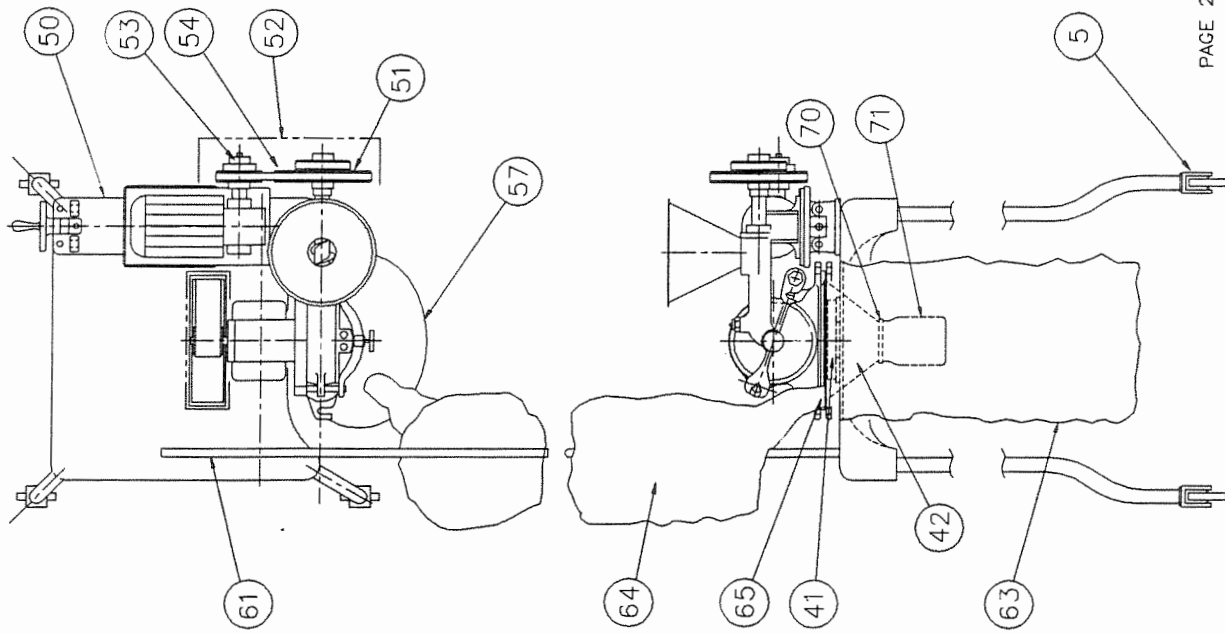
BASIC (SH) BANTAM

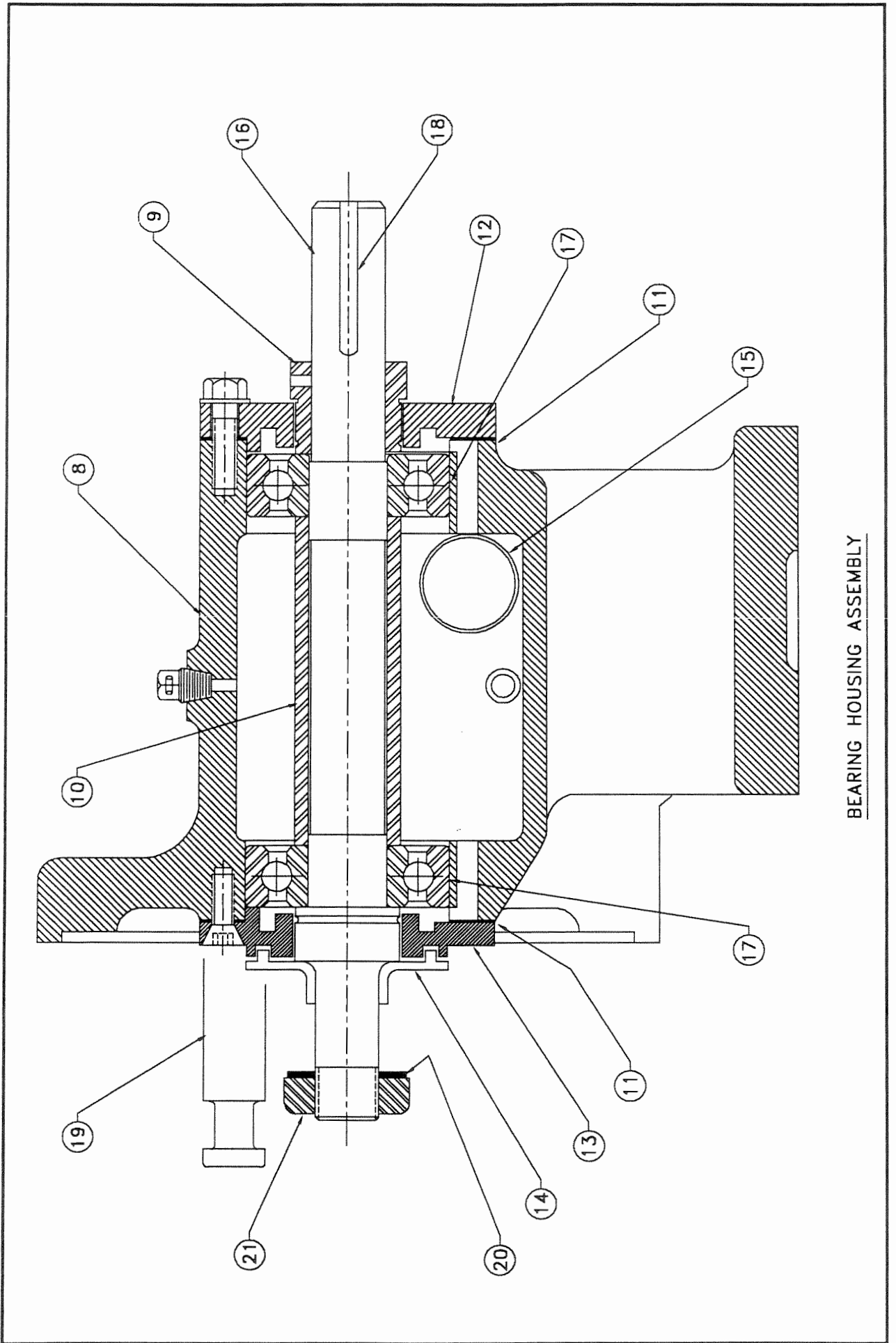


CENTER FEED BANTAM

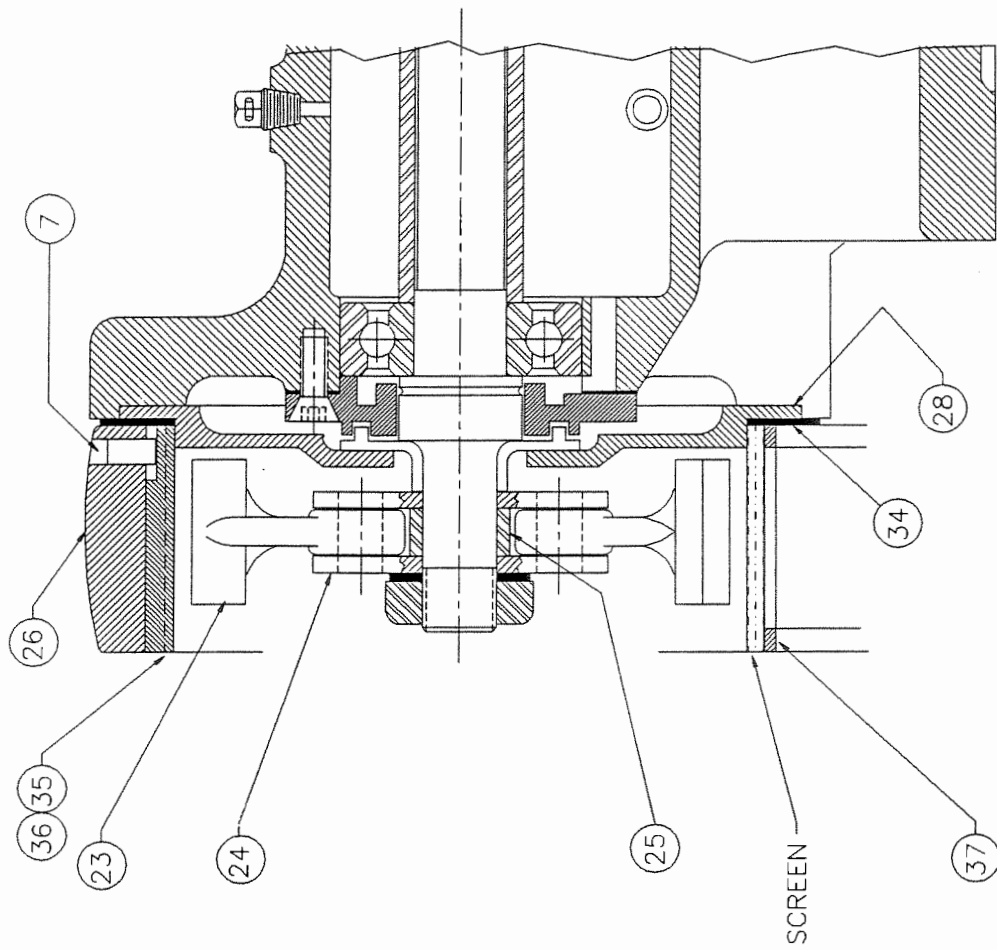


WARD BANTAM



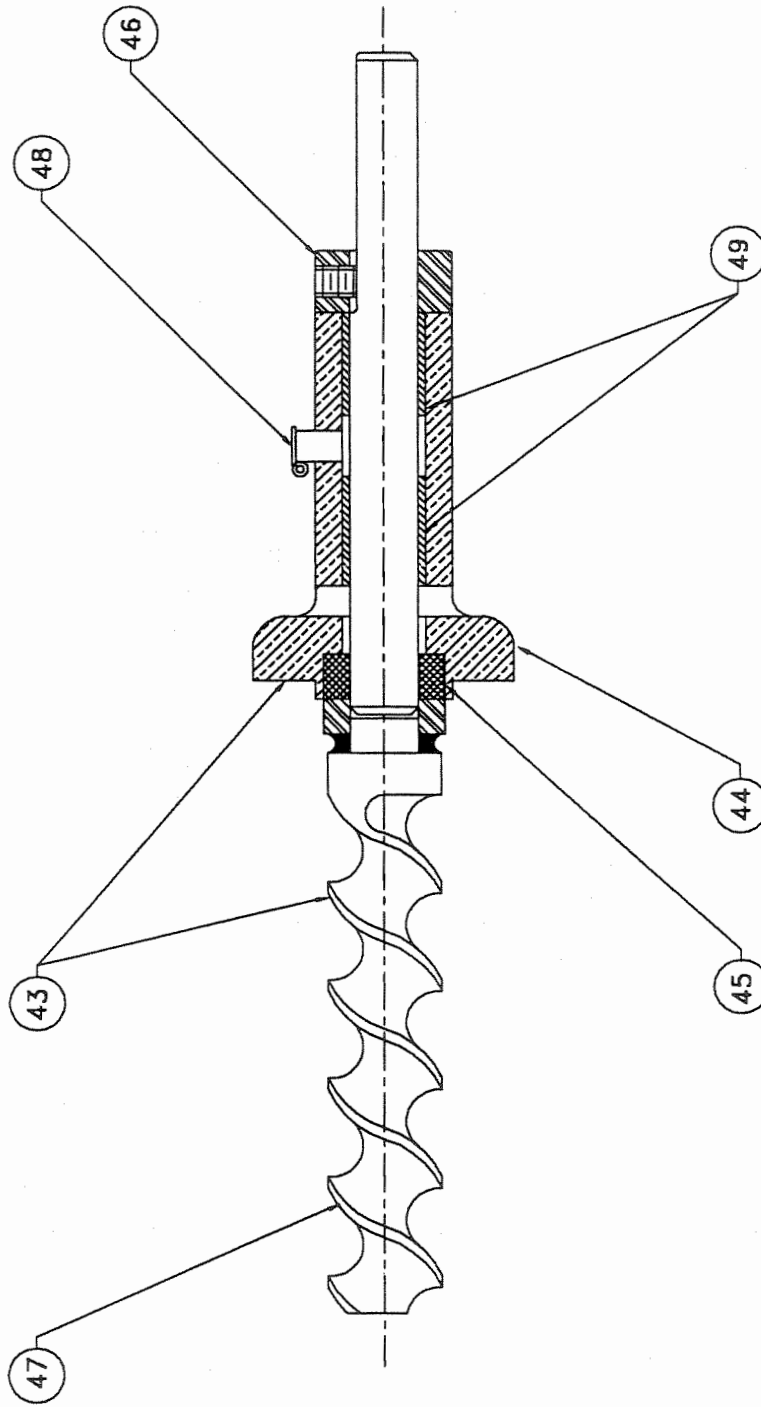


BEARING HOUSING ASSEMBLY

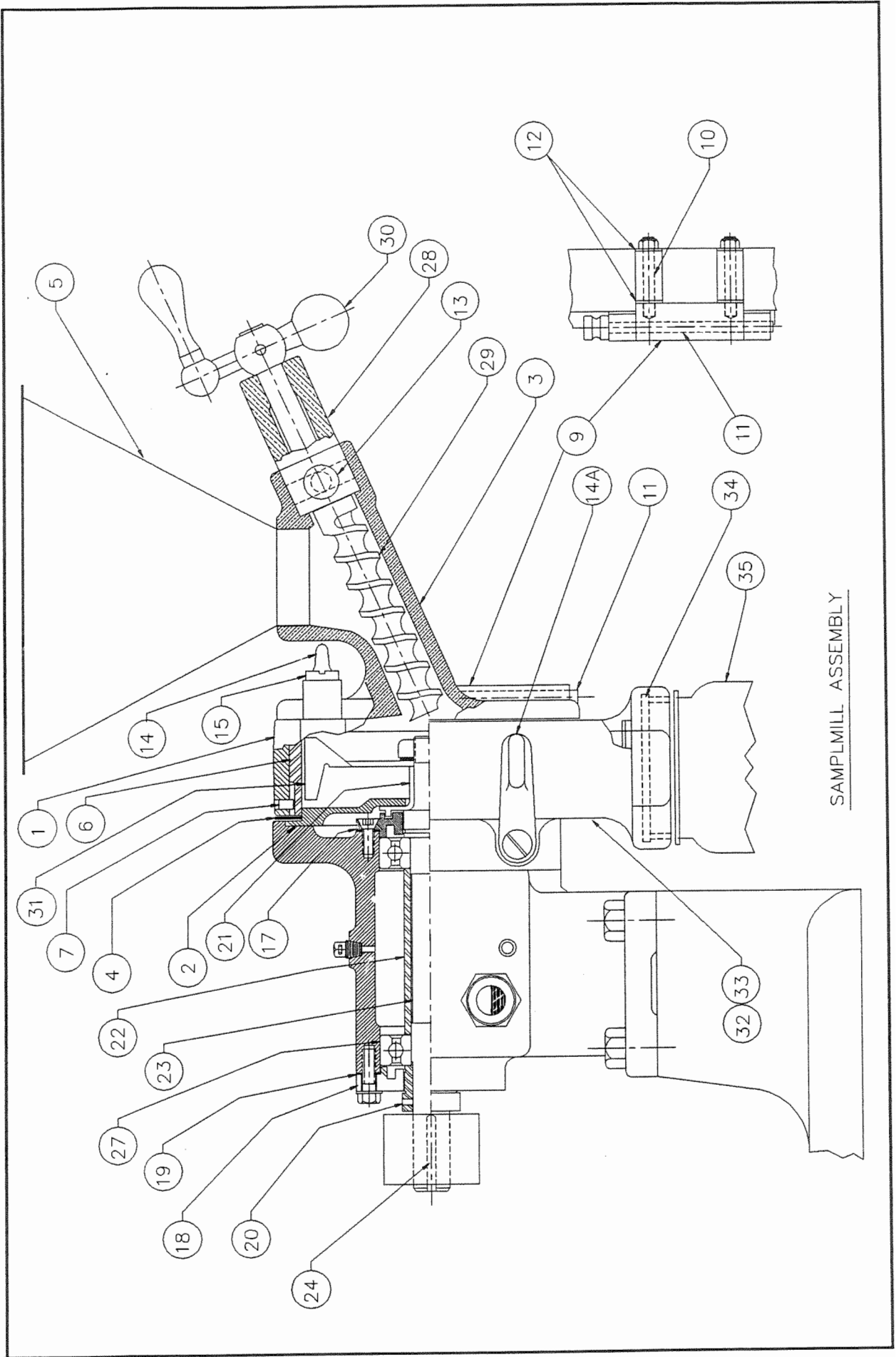


BANTAM T-HAMMER

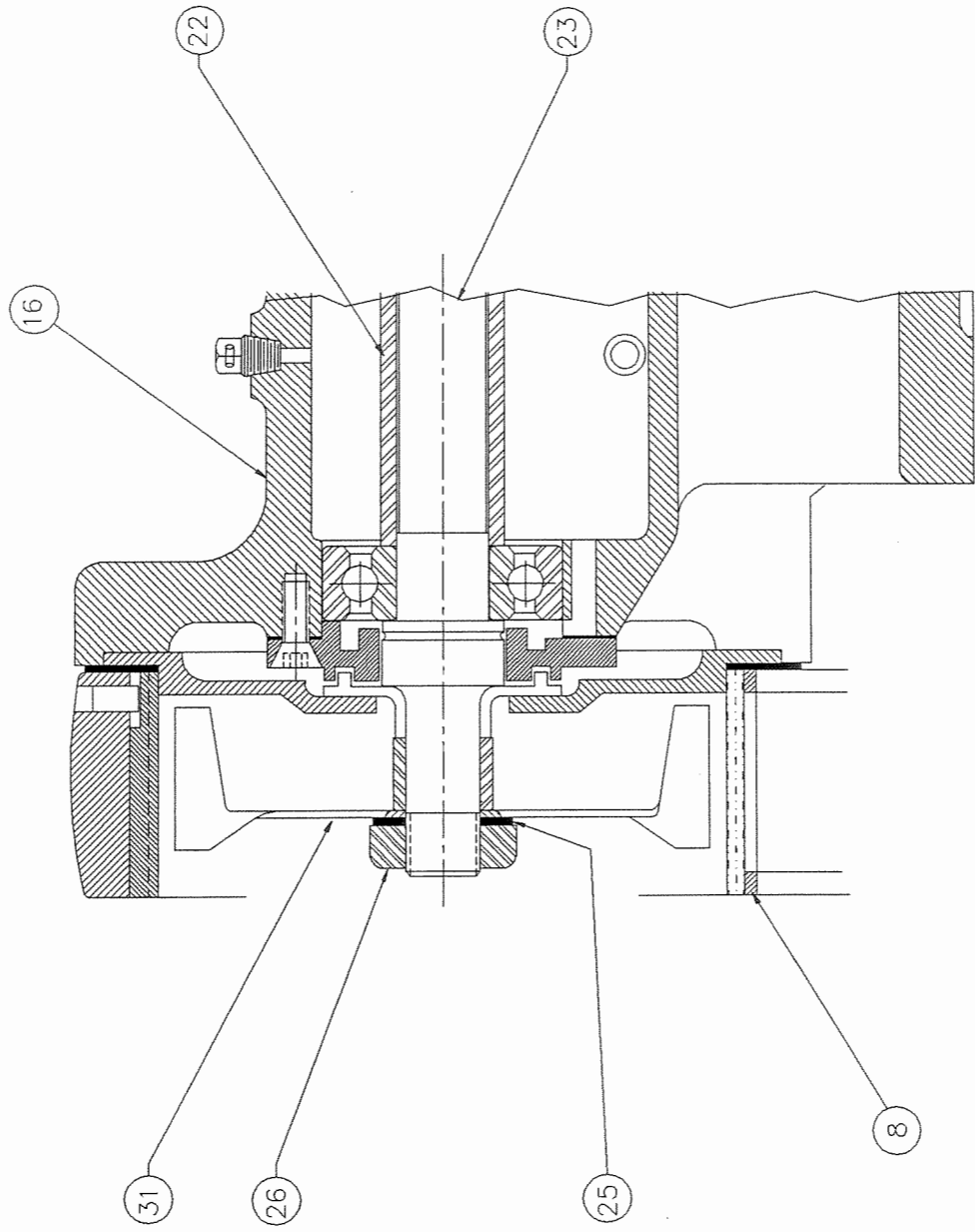
ROTOR ASSEMBLY TYPES



BANTAM FEED SCREW ASSEMBLY



SAMPLMILL ASSEMBLY



SAMPLMILL STAMPED ROTOR

ROTOR ASSEMBLY TYPES

Equipment Section	Assembly Type	Ref. Number	Part Description/Name	Qty. Req'd.	Stock Number
MILL		1	Main Body - Bronze		
		2	Main Body Cover (Pillow Block End) - Bronze		
		3	Main Body Cover w/Feed Trough - Bronze		
		4	Main Body Gasket - Vellumoid		
		5	Hopper - 316SS		
		6	Liner - 304SS		
		7	Liner Dowel Pin - CRS		
		8	Screen Backing - 304SS		
		9	Hinge Block - Bronze		
		10	Hinge Stud - CRS		
		11	Hinge Pin - 304SS		
		12	Hinge Rubber Washers		
		13	1/4"-28 x 3/4" Ig. Allen Soc. Hd. Cap Screw		
		14	Main Body Cover Clamp - Bronze		
		14A	Cleanout Door Cover Clamp - Bronze		
		15	Spacer - CRS		
		16	Pillow Block Housing - Cast Iron		
		17	End Cover (Opp. Drive End) - Cast Iron		
		18	End Cover (Drive End) - Cast Iron		
		19	End Cover Gasket - Vellumoid		
		20	Drive End Flinger - Steel		
		21	Rotor End Flinger, Stamped Rotor Type - Bronze		

SECTION VIII

DRAWINGS LIST

DRAWING LIST

SYSTEM: Bantam/Samplmill

PAGE: 1 OF 1

Manual Section	Drawing Number	Drawing Title	Revision	Latest Date/Revision
I	FIG. 1	ROTOR ASSEMBLY TYPES (2 Rotors)		
I	FIG. 2	MILL CROSS SECTION (Schematic)		
II	621966-M1	MILL GENERAL ARRANGEMENT (Parts)		
II		TYPICAL ELECTRICAL WIRING DIAGRAM		
IV	621966-M	GENERAL ARRANGEMENT (Main Dimensions)		
VI	FIG. 3	PILLOW BLOCK LUBRICATION		
VI		LUBRICATION GRAPH		
VII		BANTAM:		
		Mill Assembly Types		
		Bearing Housing		
		Rotor Assembly		
		Feed Screw		
		SAMPLMILL:		
		Mill Assembly		