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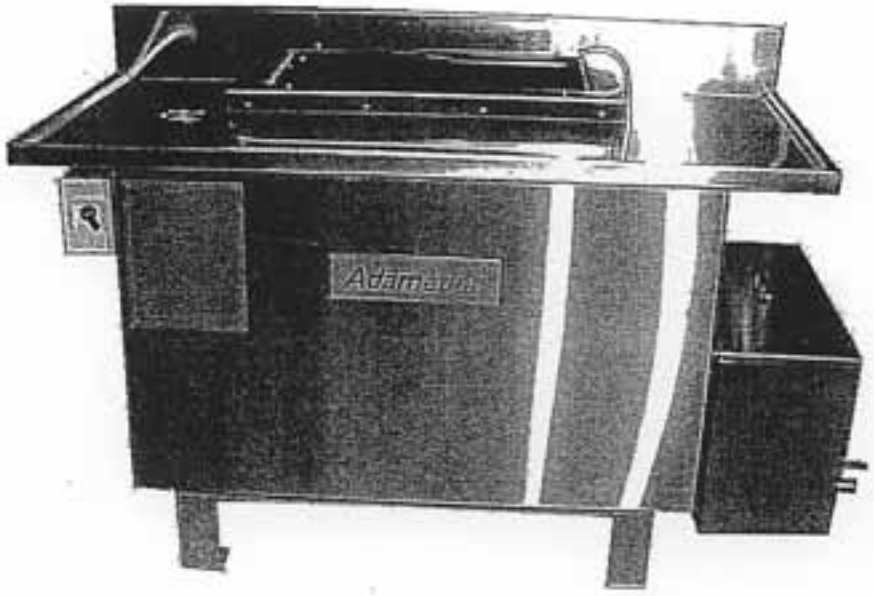

OPERATOR'S MANUAL FOR ADAMATION MODEL VM-288 SILVER BURNISHING MACHINE CONTAINS INSTRUCTIONS FOR OPERATION, MAINTENANCE, AND REPAIR

Part Number: 99-9000-021
Price: $ 20.00
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WARRANTY

Your Adamation Vibratory Burnisher is warranteed for one year. Within twelve months of the date it is put into operation, Adamation will repair any defect in materials or workmanship. Adamation normally ships warranty parts via ground shipment from its factory in Newton, MA with Adamation assuming the ground shipment charges. If the customer elects to utilize an express method of shipping, then the customer shall pay the difference in cost between express shipping charges and ground shipping charges. Warranty service may be obtained by contacting the Adamation National Service Department. For your convenience, our toll free phone number is 800-225-3075.

Because Adamation has no control over the quality, quantity and timeliness of the compounds supplied to the machine or over the methods of operation, the following items are not covered by this warranty:

1. Burnishing balls that become rusty or discolored.
2. Cost of cleaning.
3. Damage caused by unreasonable neglect and carelessness in operation.
4. Damage caused by using burnishing compounds other than those manufactured and sold by Adamation.
5. Damage caused by any modifications to the unit.

Replacement parts are warranteed for ninety days or for the remainder of the machine warranty, whichever is longer.

SECTION 1 INTRODUCTION

MACHINE DESCRIPTION

The Adamation Model VM-288 Burnisher is a heavy-duty machine for burnishing silver and stainless steel flatware and hollow ware. The Burnisher consists of three main sections; the burnishing barrel and drive assembly, the water reservoir and pumping system, and the framework and cabinet.

BURNISHING BARREL AND DRIVE ASSEMBLY

The Burnisher is equipped with an open burnishing barrel having inside measurements of 22" x 11" x 18-1/2" deep. This is filled with 450 pounds of burnishing balls consisting of 225 pounds of 3/16-inch-diameter and 225 pounds of 1/4 inch-diameter steel balls. A thick vinyl coating on the inside of the barrel prevents deterioration of the steel barrel, chemically isolates it from the burnishing process, and helps reduce the noise of the moving burnishing balls. Springs located between the barrel mounting brackets and the machine mechanically isolate the barrel from other machine parts.

A drive mechanism is integrally mounted to the base of the barrel. It consists of motorized counterweights, which set the barrel and its contents into mechanical vibrations.

WATER RESERVOIR AND PUMPING SYSTEM

The stainless steel water reservoir has a capacity of 15 gallons and holds the burnishing solution used in the burnishing process. An oscillating pump circulates the solution through the system. A drain tube is provided to remove dirty or old burnishing solution.

MACHINE FRAMEWORK AND CABINET

The machine cabinet is made of stainless steel and houses the burnishing barrel, the drive mechanism, and the solution circulating system. These are supported by an angle-iron framework. The panels of the cabinet are easily removable for servicing.

MACHINE SPECIFICATIONS

The Adamation Model VM-288 Burnisher is approximately 64 inches long, 25 inches wide and 36-1/2 inches high, to the top of the working surface. Standard electrical requirements are 208/240 volts, 60 Hz, 3 phase AC service. Other electrical services can be accommodated by special order.

CAPACITY

The Burnisher will burnish any silver or stainless steel pieces that will rotate freely in its vibrating barrel. The machine has a capacity of 250 to 300 pieces of mixed flatware at one time. If the load consists entirely of forks, the capacity is reduced to 150 pieces.

The hollow ware capacity depends entirely on the size and fragility of the pieces. With small items such as ice cream dishes, the machine will handle no more than 15 at a time. The capacity for trays varies from 2 to 10 depending on their size. (For instructions on burnishing, see Section 3, "Loading and Operating".)

PRODUCTIVITY

Although the capacity of the Burnisher may be the same as many batch-type rotary burnishers, this machine has a greater production rate because of its continuous operation and faster burnishing action. An experienced operator can burnish about 10 loads of flatware per hour (2500 to 3000 pieces). Hollow ware can be burnished at the rate of 20 to 100 pieces an hour depending on their size and fragility. These figures apply to operations that have an established silver-burnishing program.

TRAINING PROGRAM

Operators can be successfully trained quickly. No previous experience is necessary and operators can be shown how to properly run the Burnisher in a few minutes.

BASIC FUNCTIONING

The burnishing function is accomplished in the burnishing barrel loaded with the 1/4" and 3/16" steel burnishing balls. Silverware is burnished by contact with the moving balls. (For a detailed description of the "Theory Of Burnishing", see Section 4.)

ACCESSORIES

LOCKING COVER ASSEMBLY

An optional locking cover assembly is available for all machines. The locking cover assembly provides protection against garbage being accidentally or intentionally dumped into the burnishing barrel and also protects against loss of the burnishing balls. The cover is equipped with padlock lugs to insure security. (The padlock is not included.)

MEDIA SAVER

An optional media saver assembly is available for the Burnisher. The media saver is a beveled collar that fits around the opening of the burnishing barrel. It is intended to prevent spilling burnishing balls out of the Burnisher, as hollow ware is unloaded.

NOTE:

The Burnisher will not accommodate both of these accessories, only one or the other.

SECTION 2 INSTALLATION

DESCRIPTION OF PACKAGING

The Model VM-288 Burnisher is skid-mounted for shipping. The machine is encased in a heavy cardboard, "tri-wall" sleeve and cover. A cardboard frame holds the reservoir assembly above the machine. A case of VM Burnishing Powder is placed to one side, at the top of the machine. The burnishing balls are packed in eighteen 25 lb boxes inside the container on the skid at either end of the machine. A cardboard box, inside the reservoir, contains the waffle pads and drain hose.

Internally, the machine is protected against shipping damage by two wooden blocks inserted between the burnishing barrel and its frame. Metal strapping around the barrel and frame restrains movement during shipment.

INSTALLATION AND ASSEMBLY

REMOVING PACKING CARTON

The entire top section of the carton can be removed by cutting the strapping. The remaining carton walls slide off the machine allowing the reservoir kit and the carton of VM Powder to be removed from on top of the machine. The Burnisher can then be carefully removed from the skid.

REMOVING INTERNAL PACKING MATERIAL

The front and rear panels of the machine are removed by removing the screws at each end of the panels. Then, by grasping the bottom edge, lifting up, and pulling out at the bottom, the panels can be slid down and out. The metal hold-down straps are cut from around the barrel and frame, and discarded. The two wooden blocks under the barrel edge, adjacent to the larger springs, are removed by slightly prying the barrel up from below. A bar, a piece of pipe or a 2 x 4 can be used (See Figure 1).

SETTING UP LEGS

The waffle pads are packed in a carton inside the barrel. These pads are placed under each leg. The Burnisher should be located so that it is reasonably level.

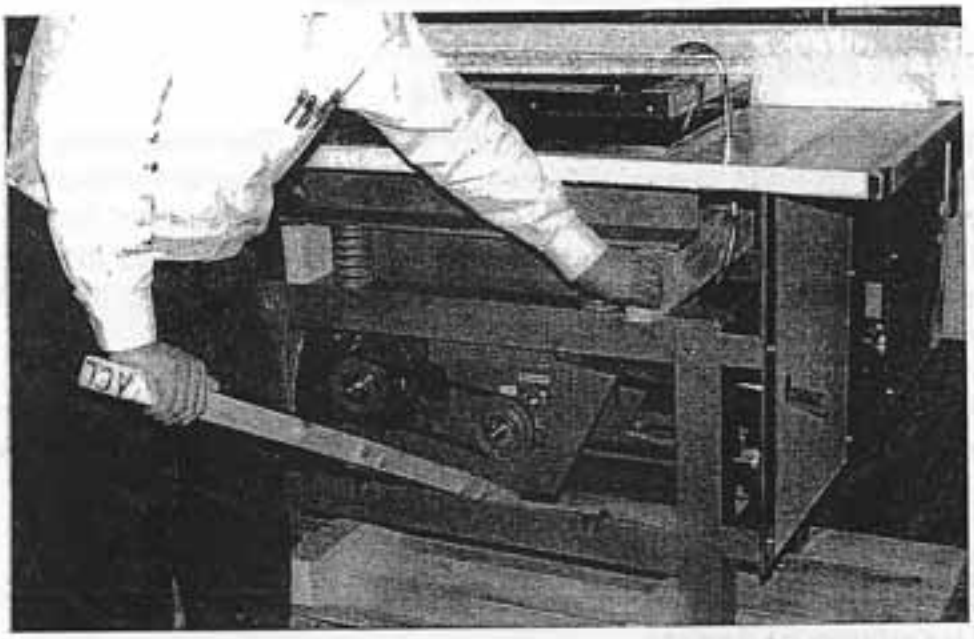

FIGURE 1

SHOWS THE METHOD OF PRYING UP THE BARREL TO SUPPORT THE WEIGHT WHILE REMOVING THE SHIPPING BLOCKS OR REPOSITIONING THE SPRINGS

BARREL INSTALLATION CHECK

The large springs supporting the barrel must be seated correctly in their top and bottom guides before operating the machine. A firm grip on the barrel and a sharp shake may be all that is needed to seat them properly if they are slightly misaligned. If one of the springs is severely out of position, lifting up the barrel as described in Section 2, "Removing Internal Packing Material", will allow it to be correctly positioned.

INSTALLING GOOSENECK ASSEMBLY

Taped to the right front leg of the frame is a stainless steel gooseneck assembly attached to a flow control valve. The gasket around the gooseneck is for waterproofing and should be left in place. From below, the gooseneck is inserted through a hole in the tabletop and the plate secured to the studs under the tabletop with the two 1/4-20 nylon lock nuts supplied on the studs. The hose is then connected to the gooseneck. Correctly installed, the outlet of the gooseneck hangs over the barrel (See Figure 2). It is important that the gasket form a tight seal with the tabletop.

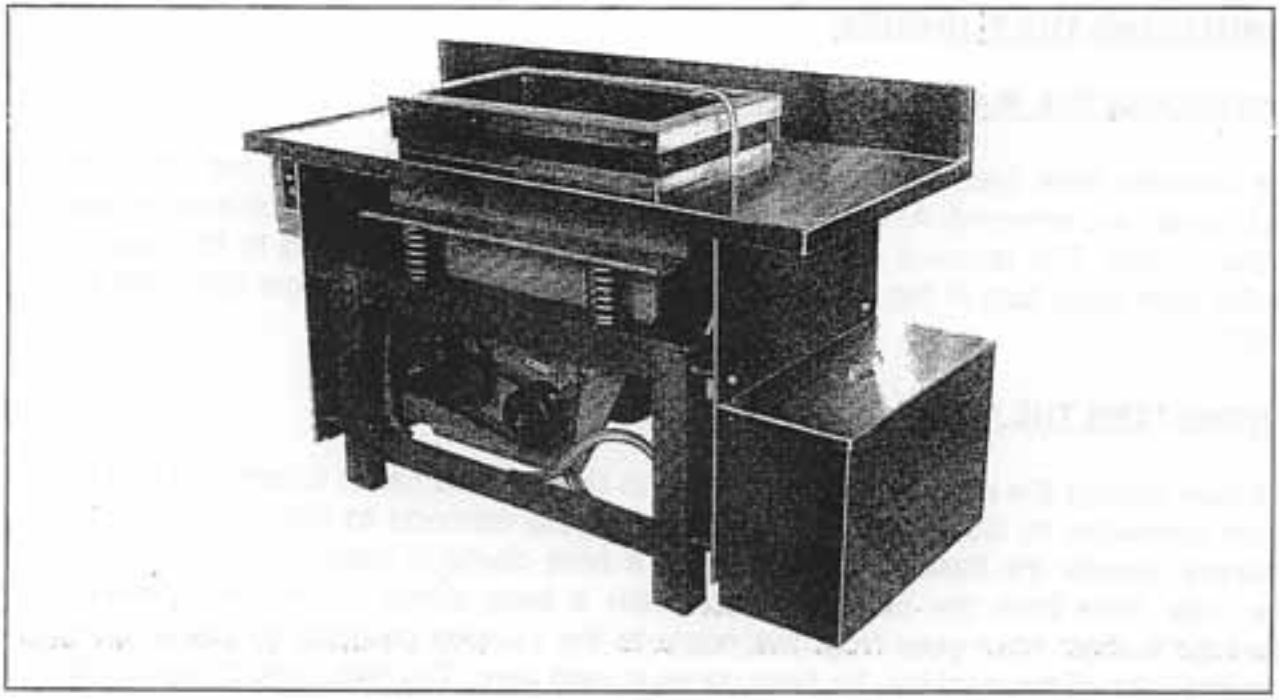

FIGURE 2

SHOWS THE RESERVOIR ATTACHED. NOTE THE MOTOR DIRECTIONAL ARROW ABOVE THE RIGHT PULLEY

MAKING ELECTRICAL CONNECTIONS

NOTE:

A disconnect switch should be provided within easy reach of the machine to facilitate servicing and for safety.

NOTE:

Before wiring the machine, make sure that the correct electrical service is available at the disconnect switch. Electrical requirements for the machine are shown on the nameplate. To make the electrical connections, the front of the electric starter box is removed. All wiring should be capable of handling 10 amp service and be in accordance with local codes.

To make the connections, waterproof flexible conduit is installed from the disconnect switch (power source) to the starter box. Connections are made from the disconnect switch to the terminals marked L1, L2, and L3 in the starter box. The front of the electrical starter box is not replaced until after the completion of Section 2, "Pre-Operation Check", Step 8.

CONNECTING THE PLUMBING

INSTALLING THE WATER RESERVOIR

The stainless steel water reservoir must be bolted into position, while the front and back panels are removed. A nut is used as a spacer between the reservoir and the side of the cabinet. The reservoir drain and the shut-off valve are attached to the opening on the right hand face of the reservoir. This valve must be closed before operating the machine.

CONNECTING THE HOSES

The tape holding the loose ends of the hoses to the machine frame is removed and the hoses connected as shown in Figure 3. The red hose connects to the opening on the reservoir nearest the front of the burnisher. A hose clamp is used in the connection. The clear hose from the barrel connects with a hose clamp to the next reservoir opening. A short hose goes from the pump to the nubbed coupling on the reservoir near the back of the machine. No hose clamp is used here. The final hose connects with a hose clamp to the entrance of the gooseneck.

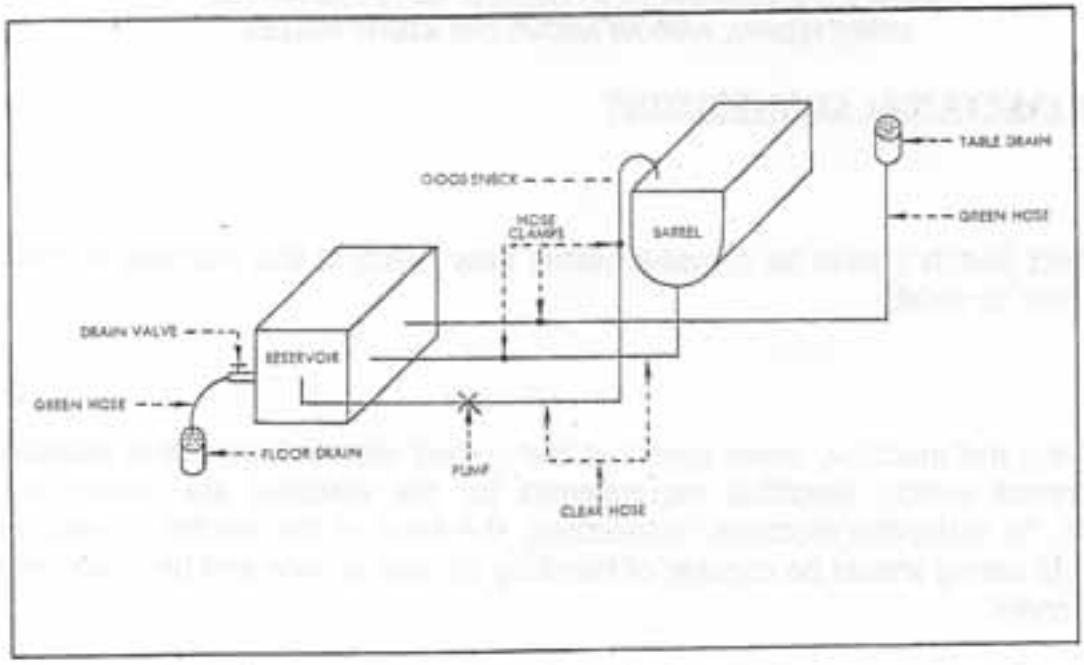

FIGURE 3

DIAGRAM OF HOSE CONNECTIONS

LOADING THE BURNISHING BALLS

The machine is shipped with 450 pounds of specially sized burnishing balls as described in Section 1, "Burnishing Barrel and Drive Assembly". All units are shipped with the balls inside the shipping carton. The balls are contained in eighteen 25 lb. boxes, which are emptied into the barrel of the machine. The level of the burnishing balls should be within 6 inches of the top of the barrel and should be maintained at this level.

NOTE:

Use only the burnishing balls supplied with the machine. If replacements are necessary, use approximately a 50% to 50% mixture of 1/4" and 3/16" steel balls. (See Section 1, "Burnishing Barrel And Drive Assembly".) Do not use burnishing balls smaller than 3/16" diameter as they will clog the drain holes in the barrel.

PRE-OPERATION CHECK

The following items must be checked in the order listed before operating the machine.

1. With the front and back panels removed, check to be sure that all packing material has been removed from the inside of the machine.

2. Check the barrel mounting springs to be sure that they are seated properly.

3. Check that the gooseneck assembly is tightly secured and that the opening hangs over the barrel.

4. Check the rotation of the motor by turning the machine on momentarily. The direction of correct rotation is indicated on the motor frame by an arrow. The machine will not operate properly unless this rotation direction is correct. If it is wrong, change any two leads (L1, L2, L3) at the electric starter box. (TURN OFF THE CURRENT AT THE DISCONNECT SWITCH BEFORE MAKING ANY CHANGES.)

5. Check all hose connections to be sure that they are correct and tight.

6. Close the drain valve on the reservoir.

7. Replace the front and back panels.

8. Replace the front of the electric starter box.

SECTION 3 OPERATION

GENERAL

This section should be read thoroughly before operating the Burnisher. The section is intended for training new personnel and for reacquainting present operators with proper procedures. For initial operation, the procedures contained in Section 2, "INSTALLATION" must be completed before the machine is operable.

CAUTION:

Read the operating instructions before running the Burnisher. Serious damage to the burnishing balls may occur if the instructions are not followed carefully.

SETTING CONTROLS

Before operating, the disconnect switch is checked to be sure it is in the ON position. The switch on the electric starter box should be in the OFF position. The drain valve on the reservoir should be closed.

FILLING WITH WATER

The reservoir is filled with cold water to the level indicated by the line marked "FILL TO HERE" on the inside of the tank. If the reservoir already has water in it, drain and refill it with fresh cold water.

NOTE:

Reservoir should not be hard plumbed direct from incoming water supply. Doing so will void warranty.

ADDING THE POWDER OR LIQUID

CAUTION:

Never operate the machine without burnishing powder or liquid, as serious damage to the burnishing balls will result.

To add the solution, one packet of VM Burnishing Powder (Part Number 65-7400-505) or six ounces of VM Burnishing Liquid (Part Number 65-7400-502) is poured **directly** on the burnishing balls. The machine is then run without silverware for at least ten minutes to thoroughly mix the solution.

NOTE:

White spots may occur on silver that is burnished before running the machine empty for at least ten minutes to dissolve the solution. Additional burnishing will be required to remove spots resulting from premature loading.

Adamation manufactures powdered and liquid solutions specifically formulated for this machine and labeled "VM Burnishing Solution" (for Vibratory Machine). Do not use "EG" Liquid, which is designed for rotary burnishers and will not work in this machine. Substitutions of any other brand of burnishing solution will probably result in poor results and rusted burnishing balls. A sufficient supply of Adamation Burnishing Powder or Adamation Burnishing Liquid should always be kept on hand. (See Section 6, "Illustrated Parts List", for ordering information.)

LOADING AND OPERATING

STARTING UP

After charging the machine with a fresh solution and running it for at least ten minutes to mix the solution, the machine is ready to be used for burnishing. (The machine should be left with a fresh solution in it at the end of each working day. It is not necessary to change this solution at the beginning of the next day.)

The balls assume the position shown in Figure 3 when the machine is in operation. Cleaned and detarnished silverware or stainlessware is put into the machine while it is running by placing the pieces on top of the burnishing balls inside the vibrating barrel. The silver rotates within the mass of the burnishing balls and returns to the top (See Figure 3).

CAPACITY

The Adamation VM-288 Burnisher is capable of burnishing any silver or stainless piece that will circulate freely within its barrel. The capacity of the machine depends on the type of silver or stainless being burnished. 250-300 pieces of mixed flatware can be burnished at one time. If the load consists entirely of forks, the capacity is reduced to 150 pieces. The capacity of the machine for hollow ware depends on its size and fragility. Small items such as ice cream dishes can be loaded in batches of 15. Trays should be loaded two to ten at a time depending on their size.

Although trays will not circulate freely, they may be burnished if inserted into the barrel vertically about four or five abreast. The trays must be separated by the burnishing balls and the Burnisher must be attended by the operator to prevent jamming.

NOTE:

Only load a few pieces at a time into the machine. Dumping in the whole load at once will cause damage to the silverware as well as inhibit the burnishing process. Never put dirty or tarnished silverware into the Burnisher.

CAUTION:

Overloading the machine can seriously damage the silver.

TIME REQUIRED

The time required for burnishing depends upon the condition of the surface of the silver to be processed. Silver that is burnished regularly requires as little as four minutes, while badly scratched pieces may require a first treatment of 20 to 30 minutes.

The operator determines that the burnishing of a piece is completed by inspecting it as it returns to the top of the burnishing balls. When the smoothness and shine have been restored, the piece is removed from the machine.

CHANGING THE BURNISHING SOLUTION

NOTE:

The burnishing solution should be changed as soon as it becomes dirty or after four hours of use. In any case, it should be changed after the last load of silverware is burnished each day.

All silverware must be removed from the barrel and the machine turned off before changing the solution. The reservoir is thoroughly drained by opening the drain valve at the bottom of the reservoir. Then the procedures in Section 3, "Filling With Water and Adding The Powder or Liquid" are followed.

CAUTION:

Never operate the machine with dirty burnishing solution. Doing so will cause the burnishing balls to become dirty. This condition takes several hours to correct. Therefore, always change the burnishing solution regularly.

It takes only a few minutes to change the burnishing solution. The time involved in cleaning dirty burnishing balls can be as much as six hours. The time saving realized by regularly changing the burnishing solution is worth the effort.

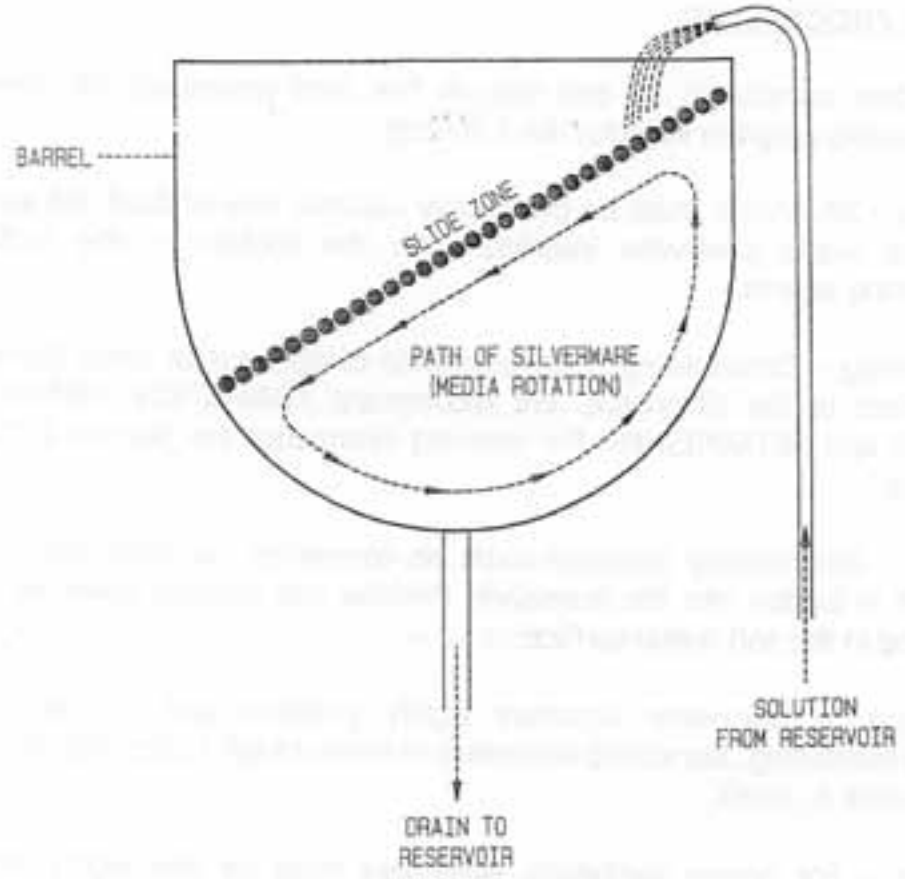

FIGURE 4

A DIAGRAM OF VIBRATORY BURNISHING

CAUTION:

Never wash the burnishing balls with water or rinse them with a hose even if they are dirty or rusty. See Section 5, "Burnishing Balls-Problem B for instructions for cleaning the balls.

SILVERWARE PROCESSING SCHEDULE

SCHEDULED BURNISHING

For the best maintenance of silverware, a routine burnishing schedule is recommended. The frequency of burnishing required depends on the frequency of use of the silverware and the tarnish and scratch resistance of the particular pattern. Maintaining burnished silverware increases the life of the piece and facilitates washing.

SILVERWARE PROCESSING

Burnishing is best considered as one step in the total processing of silverware. A complete processing program includes the following:

1. Washing – Silverware must be thoroughly washed, free of food soil and grease, as these would otherwise interfere with the contact of the surface with detarnishing agents.

2. Detarnishing – Detarnishing removes sulfide compounds of silver (tarnish) from the surface of the silverware. We recommend ADAMATION INSTANT SILVER CLEANER and DETARNISHER. For ordering information see Section 6, "Illustrated Parts List."

3. Rinsing – Detarnishing solutions must be completely removed from silverware before it is loaded into the burnisher. Residue can damage silver by becoming imbedded in the soft metal surface.

4. Burnishing – Silverware becomes highly polished and "surface-hardened" through burnishing. Burnished silverware exhibits a high luster, resists tarnishing, and is easier to wash.

5. Washing – For proper sanitation, silverware must be thoroughly rinsed after burnishing.

PREPARING NEW SILVERWARE

Some new silverware is factory-coated with a polishing agent that also serves as a tarnish prevention. This polishing agent, which cannot be seen on the silverware, combines chemically with the burnishing solution leaving a blue-gray residue after burnishing. Therefore, before burnishing new silverware, it is advisable to wash it to remove as much of the coating as possible. Some of the coating remains even after washing and results in the formation of some residue during burnishing. This residue is removed by washing after the burnishing process is completed.

SECTION 4 THEORY OF BURNISHING

THE BURNISHING PROCESS

Burnishing is a process that combines polishing and surface hardening without using metal-removing abrasives. Though a metal surface may appear to exhibit an even, uninterrupted surface, in reality it is composed of tightly packed individual grains. The principal of burnishing provides that the hardness and shininess of metals can be enhanced through manipulation of these particles.

An examination of a well burnished piece of silver reveals a smooth surface, free of scratches and without a residue of silver sulfide (tarnish). Through normal use, metalware receives multiple small scratches. In addition, sulfur dioxide in the air acts upon the edges of the scratches to make them jagged and raised resulting in metalware which is low in luster and rough in surface texture.

The burnishing process corrects these imperfections by tumbling the metalware in a burnishing media of smooth heavy objects. The media compacts the surface, rolls down scratches, and slips surface metal to fill in depressions. At the same time, the metalware is flushed free of the small amounts of silver sulfide not removed in detarnishing. The result of this compacting is a shiny, hardened surface, which not only improves the appearance of the silver, but also makes it more scratch resistant and easier to clean.

THE VIBRATORY BURNISHER

The Model VM-288 Burnisher uses burnishing balls consisting of highly polished 3/16" and 1/4" steel balls. This mass of steel balls is put into motion by the vibrations of the burnishing barrel. This causes the mass to be lifted up on one side of the barrel while being pushed down on the other side. The result is a continuous sliding of the mass from the high to the low side creating an area called the "slide zone". It is in this zone that individual steel balls have the greatest striking force for burnishing (See Figure 4 for a diagrammatic description).

Silverware in the barrel travels with the mass of the media repeatedly being carried into the slide zone. The burnishing results from the collective effect of multiple impacts with the balls in the zone.

The force of contact of the silverware with other ware is not injurious if it occurs with this sliding action. Impacts between silverware pieces in an overloaded barrel arise through cascading of the ware and can be damaging to the soft metal surface.

NOTE:

Optimum results are obtained with the Burnisher only when it is operated at or below the recommended loading level. For machine capacities, see Section 3, "Capacity".

The water and VM Burnishing Power (or Liquid) solution plays a two part role in the burnishing process. First, as a lubricant it ensures easy motion of the mass of balls and silverware, thus preventing damaging abrasion and overheating. Second, as a cleaning agent, the solution carries sulfides and other contaminants away from the silver surface. The limited capacity of the solution for holding these contaminants requires that it be changed at regular intervals as recommended in Section 3.

SECTION 5 MAINTENANCE

GENERAL

This section contains both preventive and corrective maintenance information. Cleaning by the operator is largely the extent of the preventive maintenance required. Corrective maintenance often does not require outside servicemen. However, if in-house maintenance services cannot solve a problem, an Adamation Service Facility should be consulted.

PREVENTIVE MAINTENANCE

CHANGING BURNISHING SOLUTION

Maintaining a clean burnishing solution as described in Section 3 is extremely important to the correct functioning of this machine. Replacing the burnishing solution with sufficient frequency insures that the time-consuming cleaning of the burnishing balls will not be necessary. (See Section 5, "Burnishing Balls – Problem D" for instructions in the event that your supply of VM Burnishing Powder-or Liquid-is exhausted.)

CLEANING THE MACHINE

Thorough cleaning of the entire machine should be completed after each period of operation. The exterior of the machine can be cleaned by wiping it with a mild soap and water solution. It should be thoroughly rinsed after washing.

NOTE:

Do not rinse the machine with a hose. If water gets into the burnishing barrel, it will dilute the solution causing it to lose its rust-inhibiting properties. Water seeping into the interior of the machine may also cause short circuits or belt slippage.

SHINING MACHINE PARTS

The appearance of the stainless steel parts can be improved by first washing them thoroughly as described in Section 5, "Cleaning The Machine" and then polishing lemon oil or any commercial stainless steel cleaner may be used.

LUBRICATION

Lubrication requirements for the Adamation Model VM-288 Burnisher are limited to greasing the shaft bearings annually. See Figure 8 for location of the bearing grease fitting number 38. Quality grease such as Alvania EP-2 is recommended.

STORAGE

At the end of the day, the machine is left filled with fresh burnishing solution. (See Section 3, "Filling With Water And Adding The Powder or Liquid".). If the machine will not be used for a period of time, the procedure outlined in Section 5, "Burnishing Balls – Problem D" should be followed to prevent permanent damage.

CORRECTIVE MAINTENANCE

This section is arranged according to the machine's systems. Under each system, most of the problems that can arise are listed with their solutions or explanations. If a problem comes up which is not covered, the nearest authorized Adamation Service Representative should be contacted. Consult Adamation's National Service Department if necessary (See Section 6).

WARNING:

Turn the disconnect switch to "OFF" before starting to work on the Burnisher.

CABINET – PROBLEM A:

Removing and Replacing The Front and Rear Panels:

Remove the screws at each end, which hold the panels in place, then grasp the panel at the bottom, lift up and pull the bottom toward you. Then pull down and out to release the panel completely. To replace, insert the upper sides in the vertical grooves and slide the panel up and under the overhang of the tabletop. Push the bottom in and pull the panel down into position to lock it in place.

INSIDE FRAME – PROBLEM A:

Removal and Replacement:

The front top angle on which the springs and barrel rest is removable to facilitate service on the barrel or bearings. It is held in place by a 1/2" bolt on each end. See Section 5, "Special Instructions For Changing The Burnishing Barrel", for detailed instructions.

NOTE:

Do not remove the angle until the weight of the barrel is supported independently of the frame. Do not rest the weight of the barrel on the frame again until the angle has been replaced and the bolts have been tightened.

BARREL – PROBLEM A:

Excessive Foaming, Sudsing, Or Splashing:

1. The drain line or hose may be crimped.

2. Excessive amounts of VM Burnishing Powder or Liquid may have been used. (See Section 3, "Adding The Powder Or Liquid".)

3. A solution other than VM Burnishing Powder or Liquid was used. (See Section 3, "Adding The Powder Or Liquid".)

4. The flow of solution into the barrel is excessive. Remove the front panel and adjust the flow by use of the valve in the line above the small pump. The flow rate should be approximately one gallon (U.S.) per minute.

5. The drain slots in the lining of the barrel are clogged. This may be determined by removing the front panel and observing the flow of water through the clear plastic tube leading from the side of the barrel to the drain. Make this observation while the machine is running.

WARNING:

Stand clear of the drive pulleys and belt or serious injury may result.

If the drain holes are found to be clogged, remove the burnishing balls from the barrel and flush or probe the drain holes until they are clear. [***DO NOT*** **attempt to drill these holes out. The holes are not round and permanent damage will occur if they are drilled.**]

BARREL – PROBLEM B:

Damage To The Vinyl Lining of Barrel:

The lining is bonded to the barrel. Tears, cuts or loosening from the barrel most often (caused by use of an unauthorized solution) requires replacement of the barrel. (See Section 5, "Special Instructions For Changing The Burnishing Barrel".)

BARREL – PROBLEM C:

Improper Or No Vibratory Motion Of Barrel (See also Section 5, "Burnishing Balls – Problem A:")

1. The pulley on either side of the motor shaft or drive shaft is cracked resulting in the loss of the shaft key.

2. The pulleys on the shaft and motor are reversed. (See Figure 4 for correct positioning.) However, these pulleys are intentionally reversed for 50 cycle operation.

3. The motor mounting bolts are loose causing loss of tension in the V belt.

4. The V belt is broken.

5. The water is not draining properly.

6. There has been a failure in the solution supply. Check the hoses and the pump.

7. The tank water has overheated due to friction. Allow the water to cool before continuing to burnish the silverware or change the solution following the instructions in Section 3, "Changing The Burnishing Solution".

8. There was no Adamation VM Burnishing Powder or Liquid in the machine when it was last operated or there is no burnishing solution in the water now.

9. The barrel is overloaded with silverware.

10. The barrel was loaded with silverware before the machine was started.

11. The motor is rotating in the wrong direction. Check the arrow on the motor frame. (See Section 2, "Pre-Operation Check, Step 4".)

12. The water has an unusually high mineral content (hard water). Have the water tested and contact the Adamation factory with the test results before using the VM Burnishing Powder or Liquid.

BURNISHING BALLS – PROBLEM A:

Incorrect Movement Of Balls:

Figure 4 shows the correct position of the balls while the machine is running. (See also Section 5, "Barrel – Problem C:")

1. The machine has not run long enough to become charged with the proper quantity of solution to insure the correct action of the balls.

2. The barrel has been loaded with silver before starting the machine.

3. The Adamation VM Burnishing Powder or Liquid has not been added to the burnishing solution or was added to the water in the tank instead of directly onto the balls.

4. Too much solution was added resulting in excessive suds.

5. There is no burnishing solution flowing into the barrel. See Section 5, "Plumbing" and Section 5, "Electrical".

NOTE:

Local water conditions may vary the amount of solution needed. One packet of Adamation VM Burnishing Powder or 6 ounces of Adamation Burnishing Liquid should be sufficient for areas with "average" water conditions.

BURNISHING BALLS – PROBLEM B:

Dirty Or Rusty Burnishing Balls:

1. This is the result of reusing a solution that is dirty, using a solution other than Adamation VM Powder or Liquid, or of using too little solution.

To restore the burnishing balls to their original brightness, first drain the reservoir and refill it with plain cold water. Next add two packages of VM Burnishing Powder or twelve ounces of VM Burnishing Liquid directly onto the burnishing balls. Now run the machine until the water becomes dirty. Drain the reservoir and repeat this procedure until the balls are bright. Finally, refill the reservoir with cold water and add one packet of Adamation VM Burnishing Powder or six ounces of Liquid directly onto the burnishing balls. Run the machine for at least 10 minutes to mix the solution before using the machine for burnishing.

Since this procedure can take as long as six hours, it is well worthwhile to change the solution regularly in the future. (See Section 3, "Changing The Burnishing Solution")

CAUTION:

Never rinse the burnishing balls with a hose or wash them with water.

If the burnishing balls have rusted into a solid mass, they are beyond repair and must be replaced. See Section 6, "Illustrated Parts List" for ordering information.

If the burnishing balls are still loose, but are coated with rust, follow the above procedure. If this fails to remove the rust completely, new burnishing balls must be purchased.

NOTE:

After cleaning the burnishing balls, inspect them for pitting and wearing before reusing them. If the balls are visibly pitted, they will not produce satisfactory results. See Section 6, "Illustrated Parts List" for replacement information.

BURNISHING BALLS – PROBLEM C:

Dirty Burnishing Balls, Metallic Coating:

1. This is the result of burnishing aluminum or pewter-like materials. To restore the burnishing balls to their original condition, follow the procedure above.

BURNISHING BALLS – PROBLEM D:

Emergency Storage Of Burnishing Balls To Prevent Rust:

1. If the machine will not be used for a considerable period of time, follow these directions for safe storage of the burnishing balls.

Add two packets of Adamation VM Burnishing Powder directly to the burnishing balls. Run the machine for a minimum of 20 minutes to mix the solution thoroughly. Shut the machine off and cover the top of the barrel tightly to prevent evaporation of the solution. If it is at all possible, the machine should be run for ten minutes each week (without silver) to recoat the balls with solution.

If rust appears, follow the cleaning procedure and repeat this procedure again using two packets of VM Burnishing Powder.

PLUMBING – PROBLEM A:

No Water Flows Into Barrel From The Gooseneck:

1. The oscillating pump has failed. Check the pump first by touching it carefully to see if it is vibrating. The pump should vibrate rapidly. If it does not, see Section 5, "Electrical".

2. If the pump is vibrating but not pumping, connect a hose to the gooseneck and back flush the line or remove the feed tube from the reservoir and flush water through it. This will either prime the pump or dislodge any obstruction in the pump. If this does not start the solution flowing, and all other systems are all right, replace the pump.

3. There is a crimp in the small hose from the pump to the gooseneck assembly.

4. The reservoir is not filled to the indicated level. Drain, refill and add solution.

5. The inlet tube to the pump is clogged where it is attached to the reservoir.

6. The valve in the line from the gooseneck to the pump is closed.

PLUMBING – PROBLEM B:

Leaks:

1. Locate the faulty hose connections. Reconnect the hose firmly. If the hose has aged sufficiently to prevent it from being firmly attached, it should be replaced.

ELECTRICAL – PROBLEM A:

Oscillating Pump Does Not Vibrate:

Turn off the disconnect switch and check all electrical connections to the pump. Pay special attention to the small rectifier (diode) in the line. Be sure that the rectifier connection clip has not become separated from its wire connection clip. If all connections are all right and if the rectifier is not burned out, replace the pump.

ELECTRICAL – PROBLEM B:

Machine Does Not Start:

1. Check the disconnect switch, main switch, circuit breakers and/or fuses in the power supply line to the machine.
2. Turn off the disconnect switch. Open the electric starter box and check the connections to the power supply.
3. Check the overload heater in the electrical starter box.
4. There are broken leads inside the conduit box on the motor.
5. There are burned out or broken windings on the motor. Check by taking an amperage reading.

NOTE:

When servicing the motor, it is most important to replace the "Duxseal" mastic inside the motor conduit box to prevent movement and subsequent breakage of the wires inside. Use only "Johns Manville" brand or order from Adamation.

UNUSUAL NOISES – PROBLEM A:

Unit Starts With Loud Screech Then Quiets Down:

1. The drive belt is loose. This belt should have only 1/2" free play between the pulleys.

2. The motor mounts are loose, thus allowing the motor to pitch slightly sideways towards the belt.

3. The drive belt is badly worn. Replace the belt.

UNUSUAL NOISES – PROBLEM B:

Rapping Noise When Machine Is In Operation:

1. The setscrews on the pulley are loose allowing the pulley to wander on the shaft.

2. The motor mounting bolts are loose. They must be tightened to a minimum of 40 ft. lb. of torque.

3. There has been a bearing failure.

NOTE:

It is characteristic for the bearings to bleed slightly while the Burnisher is still new.

4. The setscrews on the eccentrics (weights) are loose allowing the eccentrics to slap on the shaft.

5. The bearing mounting bolts are loose. These must be tightened to a minimum of 40 ft. lb. torque.

6. There is free play in the drive belt. This belt should have only 1/2" free play.

7. There has been a bearing failure in the drive motor.

8. The setscrews in the bearing collar on the drive side of the motor shaft are loose.

9. There is a clipped or broken drive shaft pulley.

UNUSUAL NOISES – PROBLEM C:

Excessive Transmission Of Vibration And Noise:

1. The machine is not set reasonably level.
2. The "waffle" rubber footpads were not installed under each leg.
3. The springs are not properly seated on the frame of the barrel.
4. There is not enough water in the reservoir and barrel.

NOTE:

If the problem you are having with your machine is not mentioned in this section, or if the solutions listed do not solve the problem, contact:

Adamation National Service Department
87 Adams Street
P.O. Box 95037
Newton, Massachusetts 02495-0037
U.S.A.
Phone: (617) 244-7500
(800) 225-3075
FAX: (617) 244-4609

SPECIAL INSTRUCTIONS FOR CHANGING THE BURNISHING BARREL

REMOVING THE BURNISHING BARREL

Occasionally, because of damage to the vinyl coating inside the burnishing barrel, it is necessary to replace the barrel. Since this part weighs 350 pounds, the following special instructions are provided for removing and replacing it.

The disconnect switch should be in the OFF position before beginning work on the Burnisher. Then the bezel, top and all side panels are removed from the frame. Next, the burnishing balls are removed from the barrel, and all drive and plumbing connections to the barrel are disconnected. It is now possible to lift the barrel off its mounting springs using a hoist.

While a hoist is preferred, if such equipment is not available, one alternative method is included here. This procedure uses two 2 x 4's, 30 inches long. The pieces of lumber are placed across the lower bars of the frame and against the drive carriage of the barrel (See Figure 5). By standing on the frame at the end of the machine, it is possible to lift the spring mounting bar far enough up to allow each piece of lumber to slide under the drive carriage of the barrel. The lumber can be moved into place by pushing it with one foot while balancing on the other. After both pieces have been located, the barrel supports will be clear of the mounting springs.

The front top piece of angle iron frame is removed by unbolting it at each end. This makes it possible to slide the barrel along the 2 x 4's onto a dolly.

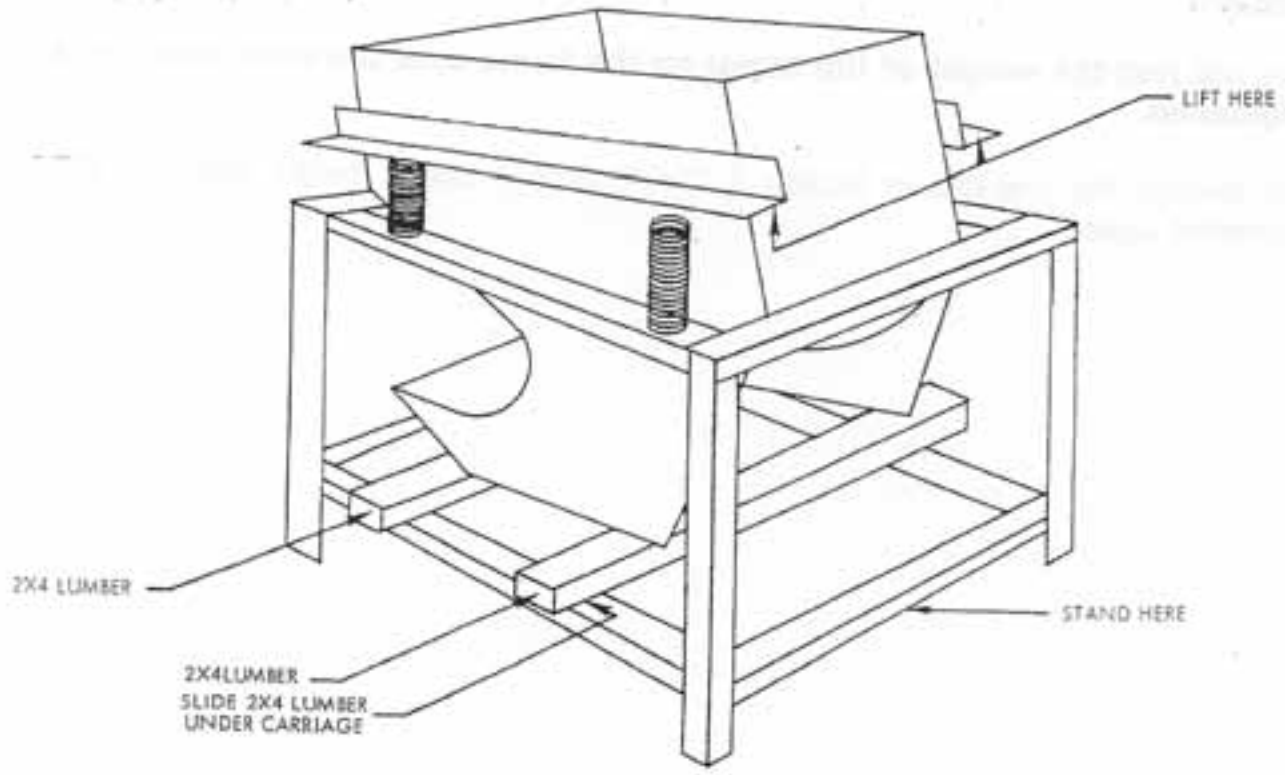

FIGURE 5

REMOVING THE BURNISHING BARREL

REPLACING THE BURNISHING BARREL

To replace the barrel, it is lowered into position with the hoist and the connections that were removed are re-made. Before operating the Burnisher again, go through the checklist in Section 2, "Pre-Operation Check" to be sure that all is in readiness.

If a hoist is not available, reverse the alternative method above.

The top front piece of the frame is replaced. If the holes do not line up, the side angles have slipped down and in. The frame should be carefully repositioned, and the pieces bolted together. Next, the springs are set in their guides.

Using the same technique as shown in Figure 4, the 2 x 4's are removed and the barrel rested on the springs. Then the sides, top and other remaining pieces are replaced and reconnected.

NOTE:

Do not rest the weight of the barrel on the frame until the bolts have been tightened.

Go through the checklist in Section 2, "Pre-Operation Check" before operating the Burnisher again.

SECTION 6 ILLUSTRATED PARTS LIST

GENERAL

This section is a complete listing of all of the replaceable parts on the Adamation VM-288 Burnisher. The lists coordinate with exploded view drawings for easy identification of the parts. The reference numbers in the list refer to those in these drawings.

One abbreviation is used: NPN. NPN stands for "no part number". This is used before part descriptions that are parts of a larger assembly and are not available separately.

ORDERING INFORMATION

All listed parts are available directly from Adamation, Inc. and from its network of parts distribution centers, service offices and service representatives. Parts should be ordered directly from the service facility nearest you. Orders should include the quantity needed, the exact part number listed, and the description as given in the list.

All goods are sold FOB Newton, Massachusetts, freight prepaid and charged as a separate item on the invoice unless otherwise requested. Orders are subject to the approval of the Adamation credit department. The company's terms are Net 30 days. Also, for the convenience of our customers, orders may be charged to Mastercard, Visa or American Express. Price information is available from the nearest Adamation service facility or from the address below.

Orders from outside the United States should be referred to the address below. Orders unable to be processed through the nearest service facility should also be referred to the following address:

Adamation National Service Department
87 Adams Street
P.O. Box 95037
Newton, Massachusetts 02495-0037
U.S.A.

ADAMATION VM BURNISHING POWDER AND LIQUID

Adamation's VM Powder and Liquid are formulated for use specifically for the VM-288.

POWDER: Packed in 52 individual packets per case.
PART NUMBER: 65-7400-505

LIQUID: Packed in cases containing four one-gallon containers.
PART NUMBER: 65-7400-502

ADAMATION VM-288 BURNISHING BALLS

VM-288 Burnisher's total capacity is 450 pounds, as follows:

225 pounds of 3/16-inch-diameter burnishing balls and
225 pounds of 1/4-inch-diameter burnishing balls.

Each is packed in 25 lb. sealed "rust-inhibited" boxes:

3/16-inch-diameter	PART NUMBER: 65-7300-001
1/4-inch-diameter	PART NUMBER: 65-7300-010

ADAMATION INSTANT SILVER CLEANER AND DETARNISHER

Packed in cases containing four one-gallon containers.

PART NUMBER: 65-7400-550

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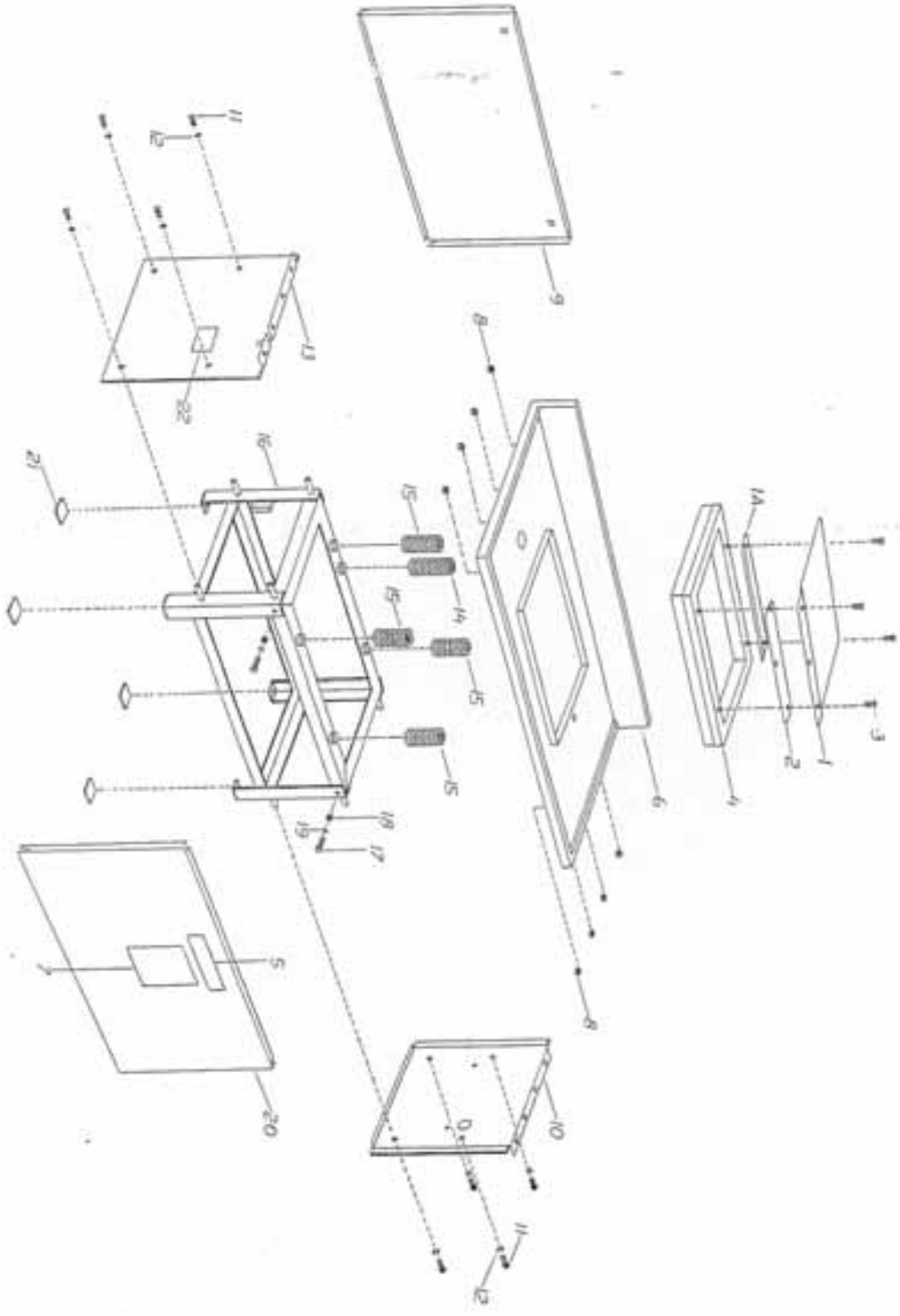

FIGURE 6

FRAMEWORK AND CABINET ASSEMBLY

PARTS LIST----VM288 FRAME WORK AND CABINET ASSEMBLY (FIGURE #6)

INDEX NO.	PART NUMBER	PART DESCRIPTION	QTY PER ASS'Y
1 & 1A	32-1409-400	LOCKING CVR ASS'Y (3 PCS, INCLUDES INDEX#2)	1
2	---	PLATE, S/S (PART OF LOCKING COVER ASS'Y)	1
3	10-1006-420	SCREW, S/S, PAN HEAD, 1/4-20 X 3/4" LONG	4
4	32-1409-200	BEZEL ASSEMBLY WITH SKIRT	1
5	17-0818-900	PLATE, NAME, ADAMATION LOGO	1
6	N.P.N.	TOP, VM-288, S/S	1
7	17-0808-902	PLATE, INSTRUCTION, ENGLISH	1
8	10-2903-420	NUT, S/S, ELASTIC STOP HEX, 1/4-20	8
9	31-1402-502	PANEL, REAR, S/S	1
10	31-1403-001	PANEL, END, RH, S/S	1
11	10-1005-420	SCREW, S/S, PAN HEAD, 1/4-20 X 5/8" LONG	8
12	10-1801-420	WASHER, LOCK, S/S, 1/4"	8
13	31-1403-002	PANEL, END, LH, S/S	1
14	70-7400-052	SPRING, BARREL, SC60-300-250	1
15	70-7400-051	SPRING, BARREL, SC50-300-375	4
16	N.P.N.	FRAME ASSEMBLY	1
17	10-1112-113	SCREW, HEX HEAD, S/S, 1/2-13 X 1-1/2" LONG	2
18	10-1900-113	NUT, HEX, S/S, 1/2"	2
19	10-1801-113	WASHER, LOCK, S/S, 1/2"	2
20	31-1402-501	PANEL, FRONT, S/S	1
21	42-1408-530	PAD, NEOPRENE	4
22	17-0810-000	PLATE, SERIAL NUMBER AND MODEL	1

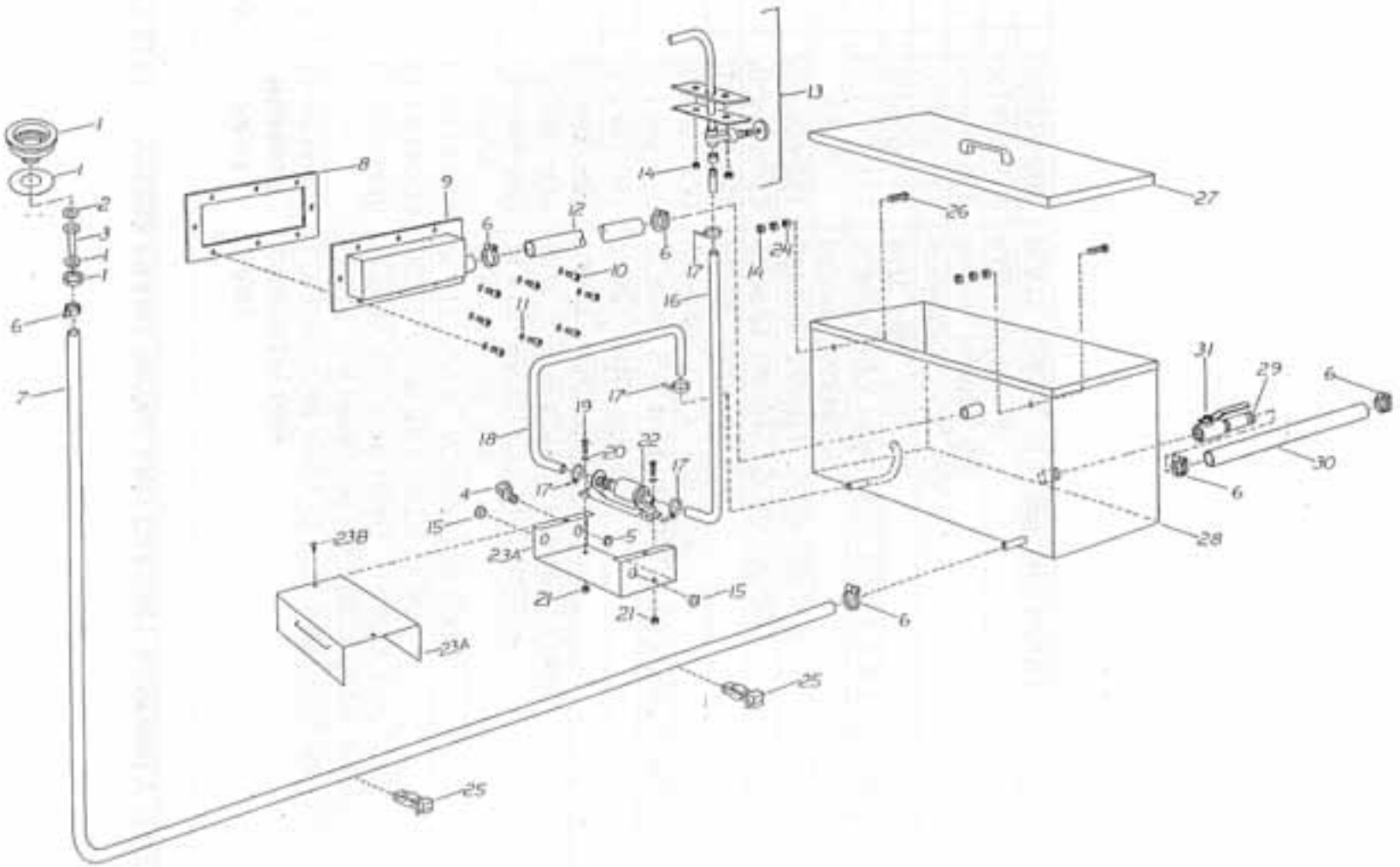

FIGURE 7

WATER RESERVOIR AND PUMP ASSEMBLY

PARTS LIST----VM288 WATER RESERVOIR & PUMP ASSEMBLY (FIGURE #7)

INDEX NO.	PART NUMBER	PART DESCRIPTION	QTY PER ASS'Y
1	75-1450-014	STRAINER, BASKET, 1-1/2" NPT	1
2	N.P.N.	RING, DRAIN (PART OF INDEX #1)	1
3	N.P.N.	ADAPTER, DRAIN, S/S (REF. A2M-14-121)	1
4	55-2003-302	CONNECTOR, SEALTITE, 1/2" NPT, 45 DEGREES	1
5	55-2818-004	LOCKNUT, ELECTRICAL, ½" NPT	1
6	70-1000-527	CLAMP, HOSE, S/S, M16H, 13/16" TO 1-1/2"	2
7	65-7112-052	HOSE, RED SINGLE BRAID, 5/8" ID X 66"	6 ft
8	19-4201-600	GASKET, SPONGE RUBBER, DRAIN BOX	1
9	32-1405-400	DRAIN BOX ASSEMBLY (SPECIAL), S/S	1
10	10-2903-420	NUT, S/S, ELASTIC STOP HEX, 1/4-20	8
11	10-1801-420	WASHER, LOCK, S/S, 1/4"	8
12	65-6212-863	TUBING, CLEAR PVC, 1" ID X 1-1/4" OD	2 ft
13	22-1415-800	GOOSENECK & VALVE ASSEMBLY	1
14	10-1900-420	NUT, S/S, FINISH HEX, 1/4-20	4
15	10-2903-420	NUT, S/S, ELASTIC STOP HEX, ¼-20	2
16	65-6212-862	TUBING, TYGON, 3/8" ID X 5/8" OD X 22" LONG	2 ft
17	55-2831-003	TIE, RAP, LARGE	4
18	65-6212-862	TUBING, TYGON, 3/8" ID X 5/8" OD X 14-1/2" L	2 ft
19	10-1005-832	SCREW, S/S, PAN HEAD, 8/32 X 5/8"	2
20	10-1801-024	WASHER, LOCK, S/S, 10-24	2
21	10-1901-832	NUT, LOCK, S/S, FLEX HEX, 8/32	2
22A	55-6300-501	PUMP, OSCILL. W/DIODE, 220V (FOR 208/230V)	1
22B	55-6300-500	PUMP, OSC. W/DIODE, 115V (FOR 480V EXPORT)	1
23A	31-1405-700	ENCLOSURE, OSC PMP, TOP&BTTM w/Index# 23B	1
23B	10-1004-832	SCREW, S/S, PAN HEAD, 8/32 X 1/2" LONG	2
24	10-1900-420	NUT, S/S, FINISH HEX, 1/4-20	2
25	70-1000-300	HANGER, CADDY #12MS-8	2
26	10-1008-420	SCREW, S/S, PAN HEAD, 1/4-20 X 1" LONG	2
27	32-1405-301	COVER, RECIRCULATING TNK, W/ HANDLE (SPCL)	1
28	32-1405-300	TANK, RECIRCULATING WITH COVER AND VALVE	1
29	75-5101-200	NIPPLE, BRASS, TANK DRAIN VALVE, 3/4" X 2"	1
30	65-7112-057	HOSE, DRAIN, DOUBLE BRAID, 1" ID X 1-1/2" OD	8 ft
31	75-8522-025	VALVE, BALL, 3/4" F X F NPT	1

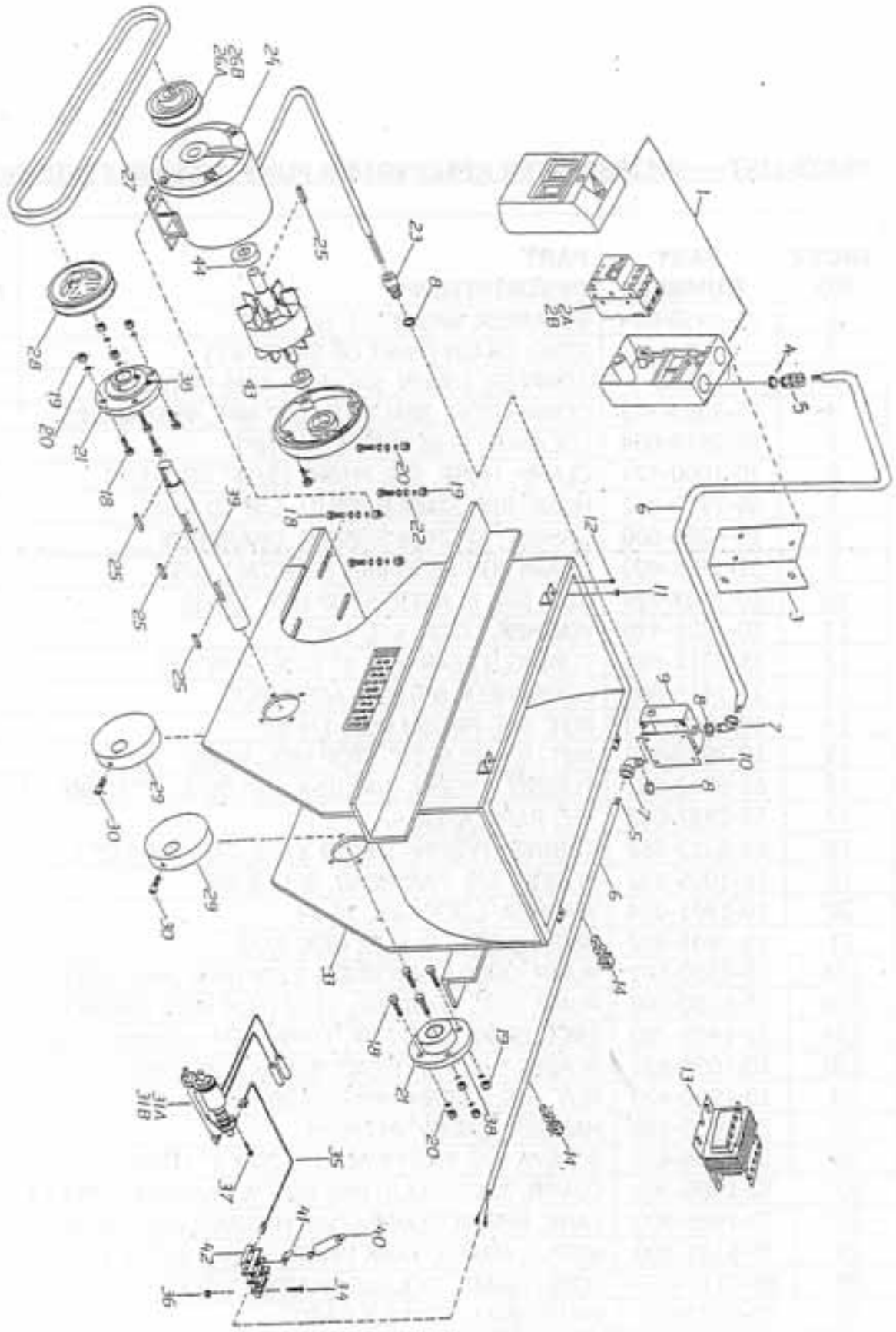

FIGURE 8

BURNISHING BARREL AND DRIVE ASSEMBLY

PARTS LIST----VM288 BURNISHING BARREL & DRIVE ASS'Y (FIGURE #8) (PAGE 1 OF 2)

INDEX NO.	PART NUMBER	PART DESCRIPTION	QTY PER ASS'Y
1	55-7382-420	ENCLOSURE, FOR GV2 STARTERS	1
2A	55-7381-804	STARTER, MOTOR (GV2M14), 6-10 A (208/230V)	1
2B	55-7381-803	STARTER, MOTOR (GV2M10), 4-6.3 A (380/460V)	1
3	14-0522-700	BRACKET, 609, SWITCH, S/S, TABLE MOUNT	1
4	55-2003-015	CONNECTOR, STRAIGHT, 3/8" SEALTITE	1
5	65-9105-140	WIRE, BLACK, THHN #14	17 ft
6	65-1000-202	CONDUIT, FLEX, 3/8" SEALTITE	5 ft
7	55-2003-305	CONNECTOR, 45 DEGREES, 3/8" SEALTITE	3
8	55-2818-004	LOCKNUT, ELECTRICAL, ½" NPT	4
9	55-0600-045	BOX, ELECTRICAL, 4" X 4", WATER TIGHT	1
10	55-1100-025	COVER, BOX, ELECTRICAL, 4" X 4"	1
11	65-7300-010	BALLS, BURNISHING, 1/4" DIAMETER	225 lb.
12	65-7300-001	BALLS, BURNISHING, 3/16" DIAMETER	225 lb.
13	55-7950-325	TRANSFORMR, ACME#TA1-32403 (480V & Export)	1
14	70-1000-300	HANGER, CADDY, #12M5-8	2
18	10-2512-316	SCREW, SOCKET CAP, STL, 3/8"-16 X 1-3/4" LONG	12
19	10-2903-316	NUT, S/S, ELASTIC STOP, PLATED, 3/8-16	12
20	10-1801-316	WASHER, LOCK, S/S, 3/8"	12
21	70-0455-051	BEARING, FLANGE, 1-1/2"	2
22	10-1800-316	WASHER, FLAT, S/S, 3/8"	8
23	55-2000-007	FITTING, STRAIN RELIEF, S/S CABLE, STRAIGHT	2
24	99-4800-054	MTR, W/PIGTAIL, 3 hp, 190-480V, 3 Ph, 50/60Hz	1
25	19-2100-104	KEY, 1/4" X 1/4" X 1-1/2" LONG	4
26A	70-6302-006	PULLEY (SHEAVE), MOTOR, BK45 (FOR 60HZ)	1
26B	70-6302-007	PULLEY (SHEAVE), MOTOR, BK50 (FOR 50HZ)	1
27	70-0500-635	BELT, "V", B35	1
28	70-6302-007	PULLEY (SHEAVE), SHAFT, BK50	1
29	21-1401-802	WEIGHT, COUNTER, ECCENTRIC	2
30	10-2512-518	SCREW, SOCKET CAP, 5/16-18 X 1-1/2" LONG	2
30	10-2512-518	SCREW, SOCKET CAP, 5/16-18 X 1-1/2" LONG	2
31A	55-6300-501	PUMP, OSCILL. W/DIODE, 220V (FOR 208/230V)	1
31B	55-6300-500	PUMP, OSC. W/DIODE, 115V (FOR 480V EXPORT)	1

PARTS LIST----VM288 BURNISHING BARREL & DRIVE ASS'Y (FIGURE #8) (PAGE 2 OF 2)

INDEX NO.	PART NUMBER	PART DESCRIPTION	QTY PER ASS'Y
33	32-1402-000	DRUM, VINYL COATED (380 lbs)	1
34	10-1005-832	SCREW, PAN HEAD, S/S, 8-32 X 5/8"	2
35	15-0701-700	WIRE, GROUNDING, OSCILLATING PUMP	1
36	10-1901-832	NUT, LOCK, S/S FLEX HEX, 8-32	3
37	10-1003-832	SCREW, PAN HEAD, S/S, 8-32 X3/8"	1
38	70-2380-050	FITTING, GREASE, STRAIGHT 1/8" NPT	2
39	21-1401-801	SHAFT, DRIVE, 1-1/2" DIA. X 17-3/4" LONG	1
40	55-6840-001	DIODE, OSCILLATING PUMP, 115/220V	1
41	55-7637-801	ADAPTER, QUICK DISCONNECT, 40 DEGREES, ¼"	1
42	55-7726-305	STRIP, TERMINAL, 2 POLE	1
43	70-0450-053	BEARING, REAR, 3 HP, REL, GE, 205KD	1
44	70-0450-064	BEARING, SHAFT END, TOSHIBA MOTOR	1