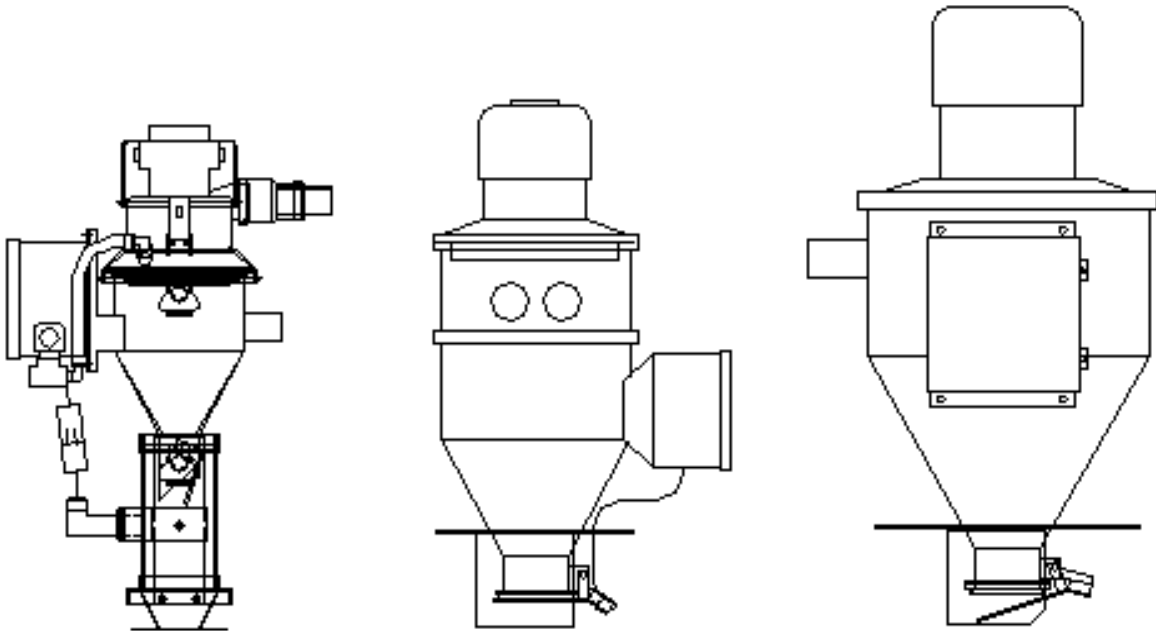


Thoreson-McCosh Inc.

SMALL SELF-CONTAINED LOADERS



INSTRUCTION MANUAL IB200103

THORESON-McCOSH INC
1885 Thunderbird St. Troy MI. 48084
Phone 1-248-362-0960
Fax 1-248-362-5270
sales@thoresonmccosh.com

Thoreson-McCosh Inc.

The information contained in this Instruction Manual is provided to you for the maintenance of your Thoreson McCosh equipment.

Also included in this manual are operating instructions, a service parts list, and wiring diagrams. Please file this manual for future use.

For additional information, please contact:

THORESON-McCOSH Inc.

1885 Thunderbird Street

Troy, MI 48084

Phone: (248) 362-0960

Facsimile: (248) 362-5270

sales@thoresonmccosh.com

CUSTOMER RECORDS

Upon receipt of your Thoreson McCosh equipment, it is very important that you complete the table below. The information will be needed to best serve you when you call the Thoreson McCosh Service Department with questions or to order replacement parts. The information is located on the Serial Tag on the unit and inside the door of the control box.

Model Name _____

Serial No. _____

Wiring Diagram No. _____

Program No. _____

Layout No. _____

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SECTION 1 THORESON MCCOSH PRODUCT WARRANTY

Thoreson McCosh warrants each product of its manufacture to be free from defects in material and workmanship for a period of 12 months from the date of delivery to the original purchaser. Thoreson McCosh's obligation under this warranty is limited to repairing or replacing any part returned to the Thoreson McCosh factory with transportation charges prepaid, and which, on examination by Thoreson McCosh, shall disclose to Thoreson McCosh's satisfaction to have been defective.

The purchaser must notify Thoreson McCosh of such defects and promptly deliver the defective part(s) in accordance with Thoreson McCosh's shipping instructions, delivery prepaid. Parts will be replaced F.O.B. Thoreson McCosh factory, by Thoreson McCosh, and will be invoiced to the purchaser with "credit on return of defective part", if the part is returned within fifteen (15) days after shipment of replacement part. Thoreson McCosh is not liable for installation or cost to install the replacement part or removal of the defective part.

Thoreson McCosh is not responsible for any failure of its product due to improper use, installation, or operation. Thoreson McCosh shall not assume any expense or liability for repairs made to any Thoreson McCosh unit or equipment outside Thoreson McCosh's own factory unless specifically agreed to in writing by Thoreson McCosh.

Equipment and accessories furnished by us, but manufactured by others, are guaranteed to the extent of the original manufacturer's guarantee to Thoreson McCosh, if that guarantee exceeds one (1) year.

It is expressly understood that Thoreson McCosh is not responsible for damage and/or injury caused to buildings, contents, products, or persons by reason of installation or use of any of our products. Thoreson McCosh shall not be liable for loss, damage or expenses arising directly or indirectly from, or being consequential or incidental to, the use of its products or from any other cause.

The above warranty supersedes, and is in lieu of all other warranties expressed or implied; and no person, agent, representative or dealer is authorized to give any warranties on behalf of Thoreson McCosh, not to assume for Thoreson McCosh any other liability in connection with Thoreson McCosh products.

SECTION 2: SMALL SELF-CONTAINED LOADER INSTRUCTIONS

2.1 INTRODUCTION

The Small Self-Contained Vacuum Loader provides economical, low maintenance loading of pelletized or granular materials. The filter is self-cleaning, and the multistage vacuum motor is designed for long service life and low maintenance operation.

2.2 METHOD OF OPERATION

The operation of the Self-Contained Vacuum Loader is quite simple and basically similar to existing vacuum loaders. Air pressure within the vacuum receiver is reduced when the multi-stage vacuum motor is energized. This reduced pressure causes the discharge valve to retract and seal, thus causing a further reduction in pressure within the receiver. The reduced pressure within the receiver results in airflow through the pick-up tube, the material line and into the vacuum receiver. The high velocity of airflow results in material pick-up and the delivery of the air/material mixture to the vacuum receiver.

Once the material is delivered into the receiver, the internal Dacron fabric filter separates the air and material. When the vacuum motor is de-energized, the vacuum in the receiver dissipates and the discharge valve opens to allow the material to exit the receiver.

An adjustable repeat cycle timer controls the AC motor. This timer has been factory-set to the times on the wiring diagram. The timer stops loading material and energizes the blowback solenoid, which allows compressed air to enter the receiver and blow the filter clean. A master level control switch allows the Self-Contained Vacuum Loader to cycle repeatedly until the machine hopper is full. It will then shut off automatically, and from that point start and stop the loader as required maintaining the desired material level in the machine hopper.

The Ratio Option is a set of controls that operate two air cylinders that allow two different materials to be conveyed into the receiver at a predetermined percentage.

2.3 INSTALLATION AND SETUP

The Self-Contained Vacuum Loader should be mounted on the lid of a machine hopper over a circular hole of 11" to 13" in diameter. The loader can then be fastened to the lid by means of the mounting holes provided on the receiver flange.

The Self-Contained Vacuum Loader will perform best when the material line is connected in the most direct manner with a minimum of bends. Care should be taken to insure that all hose connections are air tight and secure.

If the unit has the Ratio option, the two material lines need to be hooked up to the ratio valve to convey the materials from their source to the loader.

The electrical hook-up requires only the connection of the plug to 115V, single phase AC, 60-hertz.

Most units require a minimum of 60-psi compressed air to clean the filter and to drive the Ratio solenoids.

2.4 BLOWBACK

The Self-Contained Vacuum Loader has a solenoid controlled blowback function for self-cleaning the filter. After the load cycle times out, the blowback cycle starts and the blowback solenoid is activated, allowing compressed air to blow the filter clean. The cycle then repeats.

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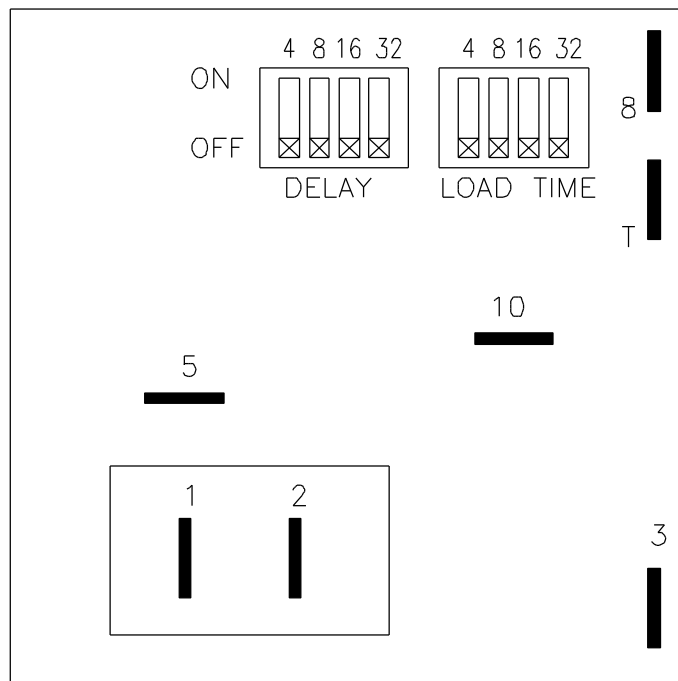
SECTION 3: STANDARD CONTROLS

3.1 INTRODUCTION

The Self-Contained Vacuum Loader comes equipped with either standard controls or optional microprocessor controls with an operator interface panel. If your loader is has the Tech II Microprocessor controls, please move ahead to Section 4.

3.2 LOAD TIME

A solid-state timer controls the load time on the Self-Contained Vacuum Loader. The timer has been preset at the factory for the size of your loader. If an increase or decrease of the load time is needed, the timer has a dipswitch for ease of adjustment. The switches have a value of 4, 8, 16, and 32. Add the values of whatever switches are on, and this will give you the load time. Example: if you want a 40 second load, turn on switch 8 and 32 on the **Load Time** dipswitch. The **Delay** dip switch controls the amount of loader off time between the blowback cycle and the load cycle.



3.3 BLOWBACK

The blowback cycle is not adjustable. The blowback is preset for 4 intervals of 2 seconds each for optimal filter cleaning performance.

3.4 RATIO ADJUSTMENT

The ratio potentiometer allows the operator to vary the delay in the switching of the inlet valves. The scale is for reference only, not for percentage. Since every system differs in the distance over which material is to be conveyed, the density of material, and that loaders are sometimes moved from hopper to hopper, it is impossible to install an exact or customized potentiometer.

When determining percentages of regrind, take the total load time and multiply by the percentage of regrind required. Using a stopwatch, adjust the timer potentiometer to set the delay to equal the percentage timer. Remember to be careful not to overfill the receiver, as this will reduce poppit valve life.

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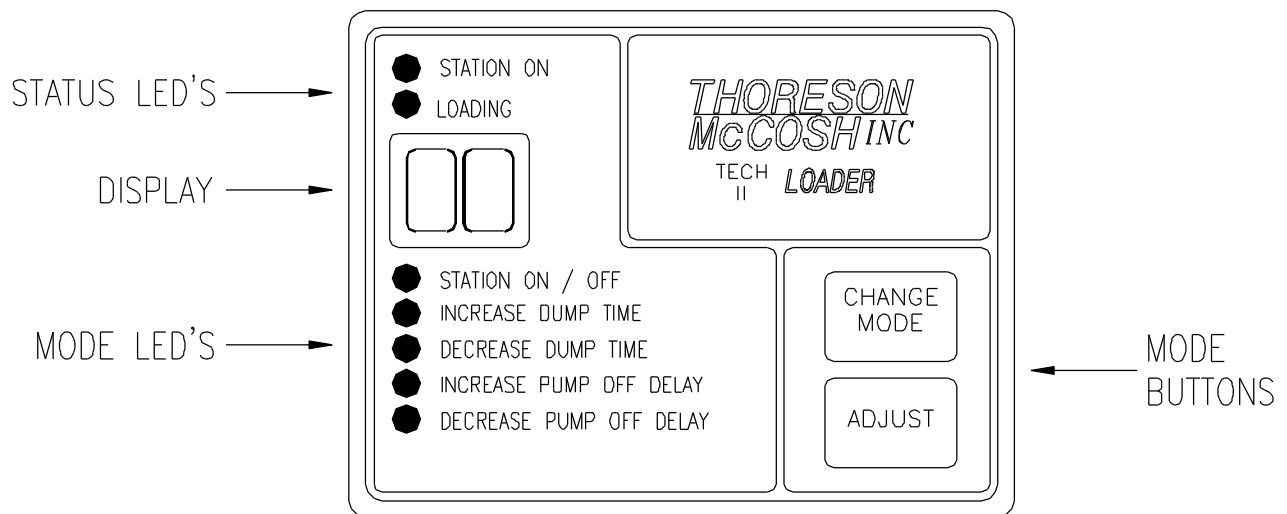
SECTION 4: TECH 2 MICROPROCESSOR CONTROLS

4.1 INTRODUCTION

The Thoreson McCosh Tech 2 Microprocessor control makes the Self-Contained Vacuum Loader much easier to use than ever before. Exact load times and ratio percentages are entered directly into the computer. And while running, the load time is a running display, showing the remaining time left in the load cycle.

4.2 OPERATOR INTERFACE PANEL

The operator interface panel allows the user to change settings and monitor the Self-Contained Vacuum Loader. With only two buttons, a few indicator LED's and a two-digit information display, the interface is extremely easy to use and understand.



- Status LED's: Show what the LOADER state currently is. When the Station On LED is lit, the loader is currently running through its cycles.
- Display: This displays the information needed for the mode currently being used.
- Mode LED's: These show what adjust mode currently is being used. When no Mode LED's are on, the loader is in the RUN mode.
- Mode Buttons: Press these to change modes and adjust loader setpoints.

4.3 OPERATION OF TECH 2 CONTROLS

If you have **PG200105**, you must set some dip switches per the following paragraph. If not skip to next paragraph.

Before using the Tech 2 controller, Some dip switches need to be configured for your individual application. First locate SW1 on the Station Control Board. If you will be using pulsating ratio, switch #2 should be ON. If you have a 7 or 12 # receiver body, switch #3 should be OFF, if you have a 45# or larger, switch #3 should be ON. (this controls the length of dump time). If you want the blowback to be continues, switch #4 should be OFF. If you want the blowback cycle to pulse, switch #4 should be ON.

When the loader is first plugged in and put into use, the loader is in RUN mode. There are three other modes: STATION OFF/ON, CHANGE LOAD TIME, and ADJUST RATIO PERCENTAGE.

To change modes of operation, press the CHANGE MODE button on the interface. The first key press will place you in the STATION ON/OFF mode and the LED corresponding to this mode will illuminate. Pressing the CHANGE MODE button further will cycle through all of the modes available and the corresponding LED's will turn on. Pressing the adjust button while in a particular mode will adjust the setting currently in use.

4.4 STATION ON/OFF

This mode controls the state of the loader. While on, the loader will load material, clean its filter or wait for the machine to call for material, then start its normal cycle. While off, the loader sits and waits to be turned on again.

4.5 CHANGE LOAD TIME

This mode adjusts the load time of the loader. While in this mode, the display will show the current setpoint of the loader in seconds. To change the setpoint, press the ADJUST button in the appropriate mode. The loader will continue in normal operation while the setpoint is being changed. The new setpoint will take effect on the next load cycle.

4.6 RUN MODE

This mode is the normal mode of operation. No mode LED's will be illuminated in this mode.

The display will show the current load time setpoint when the loader is not loading material. When the loader is loading material, the display will show the load time remaining in the load cycle.

4.7 ADJUSTING RATIO PERCENTAGE

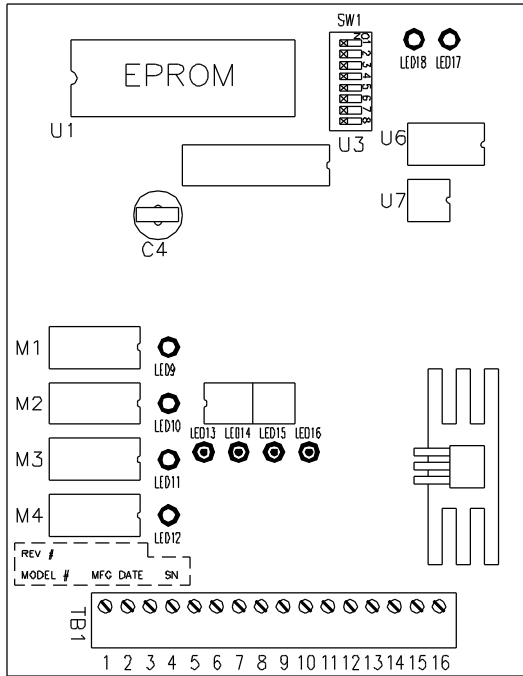
This mode adjusts the ratio percentage of the loader. While in this mode the display will show the current setpoint in percentage of total time of the load cycle. To change the setpoint, press the ADJUST button in the appropriate mode. The loader will continue in normal operation while the setpoint is being changed. The new setpoint will take effect on the next load cycle

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4.8 STATION CONTROL BOARD SECTION

413877

A



TB1

- 1 LED 9 BLOWBACK
- 2 LED 10 DIVERTER VALVE/ NO LOAD ALARM
- 3 RATIO
- 4 LOAD
- 5 OUTPUT COM (FEED)
- 6 LED 13 STA 1 LIMIT SWITCH
- 7 LED 14
- 8 LED 15 STA 2 LIMIT SWITCH
- 9 LED 16
- 10 INPUT COM (NEUT)
- 11 COMMUNICATION GROUND
- 12 TX +
- 13 TX -
- 14 POWER / CT
- 15 POWER
- 16 POWER

		SYM.	AM'T	PART NO.	DESCRIPTION
MK.	DATE	STATION CONTROL BOARD			
		413877			
		THORESON McCOSH			
		1885 THUNDERBIRD ST. TROY, MICHIGAN			
		PH. 248-362-0960 FAX 248-362-5270			
		SCALE	DATE	DR. BY	DRAWING NO.
		NOT TO SCALE	08-05-98	G L K	413877A

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SECTION 5: FILTER MAINTENANCE

Standard Filter specifications:

Filter Diameter:	Part Number:	Seal Number:
7"	412432	412257-A
9.5"	408053	409402-A
15"	401354	409401-A

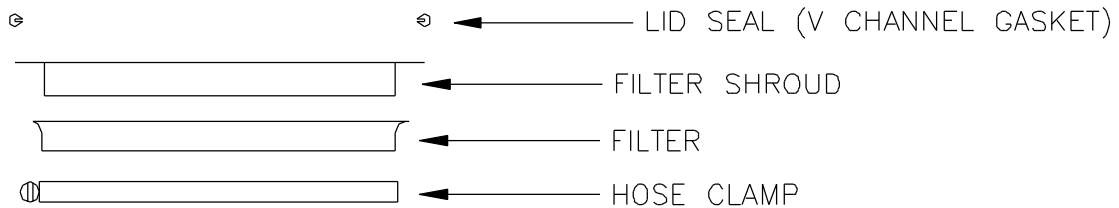
Special Filter specifications:

Filter Diameter:	Part Number:	Style	Purpose
7"	412487	Teflon Coated	Dusty Mat'l
7"	412104	Nylon screen	Non-Dried
9.5"	405134	Teflon Coated	Dusty Mat'l
9.5"	412414	Nylon screen	Non-Dried
15"	405135	Teflon Coated	Dusty Mat'l
15"	412479	Nylon screen	Non-Dried

Other special filters are available. Contact the factory for special applications.

It is recommended that filters be checked periodically for material residue accumulation, and cleaned before the loader's performance is reduced. The filter maintenance will vary from one material to another and should be determined by the customer.

When filter material becomes worn, a new filter disc should be installed. Replacement filters are available from **Thoreson-McCosh, Inc.**



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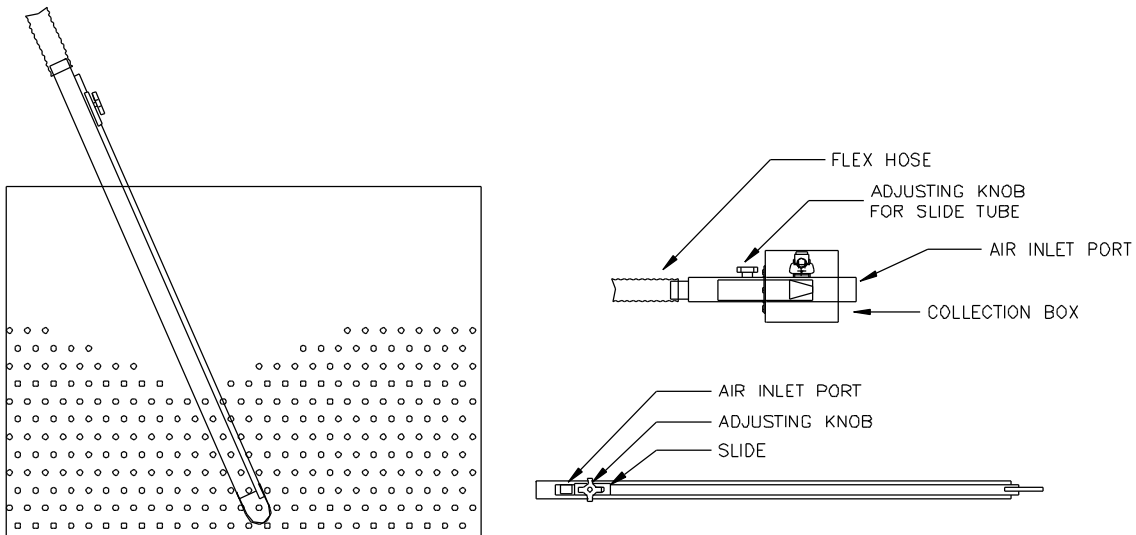
SECTION 6: MATERIAL PICK-UP TUBE / MATERIAL TAKE-OFF

The material pick-up tube has an adjustable slide to regulate the amount of air entering the tube to be mixed with the material flow. The material is aerated at the bottom of the tube so that various densities of materials can be handled with one pick-up. The suction end of the pick-up tube should be positioned at or near the bottom of the container.

The vacuum take-off has an adjustable slide tube that is used to adjust the amount of material that is mixed into the air flow.

The loading rate should have a continuous noise of material passing through the conveying pipe while the loader is in operation.

If slugging occurs, the slide/slide tube is incorrectly adjusted. To correct the problem, adjust the slide/slide tube to change the ratio of material to air flow.



MT0.DWG

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SECTION 7: TROUBLE SHOOTING CHART

PROBLEM: Loss of vacuum

Possible causes:

Filter is dirty

Leaks in hoses

Leak in gaskets

Motor malfunction

Clean filter

Inspect hoses and repair or replace

Inspect gaskets and repair or replace

Inspect the motor and repair or replace

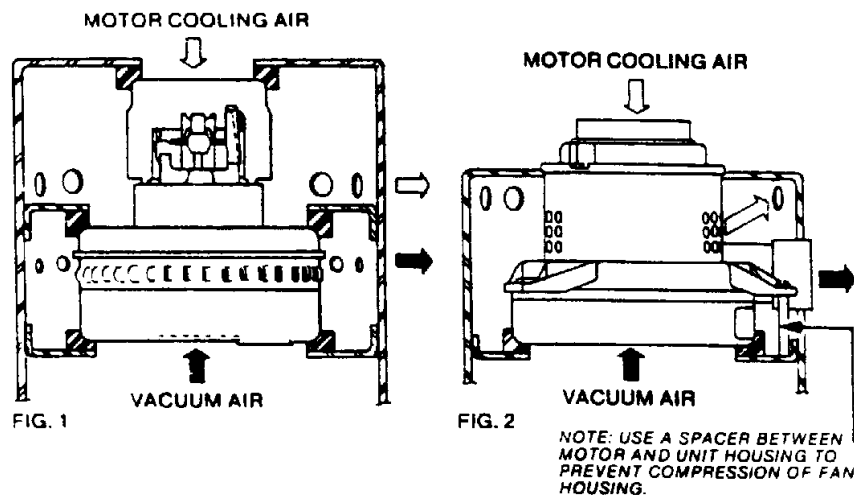
SECTION 8: OPERATING AND INSTALLATION INSTRUCTIONS FOR AMETEK-LAMB VACUUM MOTOR

8.1 INSTALLATION

A. MOUNTING

Design Application Considerations - The motor working air and ventilating air must be separated to prevent overheating of the motor. To provide for shock mounting, air sealing and electrical insulation, the peripheral discharge by-pass vacuum motors are designed to be mounted between two rubber rings - Figure No. 1. These rings are compressed to provide an air tight seal between the cooling and working air in the vacuum chamber. Care should be exercised in clamping the motor between the two rubber rings to provide sufficient pressure to resist the start up torque of the motor. Care should also be exercised not to compress the mounting rings to the extent that the mechanical shock mounting advantage is lost or the fan case is damaged. Motor should be shielded such that rotating parts and live parts are not accessible to a $\frac{1}{4}$ " diameter rod.

For tangential discharge by-pass vacuum motors, a single rubber ring is used and the ring compressed using the motor mounting lugs - Figure No. 2. To prevent electrical shock hazard, motors must always be grounded. Since the motor cooling air passes directly over the motor windings, the airflow over the motor must be dry and dust free.



B. HANDLING

Vacuum motors must be handled only by the motor frame or fan case. Do not handle the motor by lead wires as this could cause damage to the motor.

C. CONNECTION TO GROUND

Bypass vacuum motors must be connected to a grounding point within your machine in the following manner:

- 1.) The 5.7" and 7.5" diameter by-pass motor includes provision for grounding.
- 2.) The 7.2" diameter by-pass vacuum motor has three lead wires. The green or green with yellow tracer wire is for connection to ground only.

You should contact Underwriters' Laboratories, Inc. or other appropriate safety related testing agency for acceptable methods of connecting your machine to a grounding or earthen point. Do not use motor thru bolts to connect ground wires.

8.2 SAFETY PRECAUTIONS FOR USE

A. In the application of AMETEK-LAMB Electric Motors as a component in your product you must exercise the following minimum precautions:

- 1.) The motors must be connected to a proper and effective ground or mounted in a manner that will guarantee electrical isolation and insulate the user and others from electrical shock. For those motors equipped with a green hex head ground screw for grounding, the screw should be used for no other purpose. See previous discussion in item 1C, "Connection to Ground".
- 2.) Universal motors must not be used in an area contaminated by volatile or flammable materials since sparking can be expected in the normal operation of the motor and may ignite the contaminants causing a dangerous explosion. At your request, Lamb Electric can supply special electric motors designed specially for use in hazardous duty locations. See AMETEK-LAMB Electric bulletin 2-VX752-0001 for motors that are designed for use under certain hazardous conditions.
- 3.) The rotation of the motor shaft or anything mounted on the shaft is a potential source of injury and must be taken into account in the design of your end product. You must provide the necessary guarding or housing as required by the finished product and you must indicate to the user the direction of rotation.
- 4.) The motors must not be exposed to moisture or liquid or used outdoors, except in equipment which is specifically designed for outdoor use and meets the Underwriters Laboratories, Inc. requirements for outdoor use. Moisture, liquid, or foam can damage the motor and defeat the electrical insulation resulting in an electrical shock to the user.
- 5.) Equipment incorporating vacuum motors/blowers must be designed by you so as to prevent the vacuum or air pressure from being concentrated in a manner that can expose the user to bodily injury by coming into contact with any body area, such as eyes, ears, mouth, etc.

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- 6.) Lamb motors must not be operated above the design voltage, which is stamped on the motor. Over voltage conditions can cause excessive speed of the motor and can result in electrical shock and/or other traumatic injury to the operator. Lamb Electric vacuum motors may be operated at voltages below the rated voltage successfully. By reducing the voltage, performance will be lowered and reducing the voltage will enhance the life expectancy of the motor. Care must be taken in such reduced voltage applications to insure that a pure resistance is used to lower the voltage. When using alternating current, universal motors require a full sine wave for proper commutation and such pure resistance devices as a transformer or Variac should be used to reduce voltage to the motor.
- 7.) Precautions must be exercised to ensure motor leads are properly routed and retained to ensure that they do not become pinched or come in contact with rotating parts during assembly or subsequent operation. Connections must be designed so that proper electrical contact is established and the connections must be properly insulated.
- 8.) Disassembly or attempted repairs: if accomplished incorrectly, repairs can create an electrical shock hazard. It is recommended that repairs be made only by AMETEK-LAMB, Inc, and not by others.

B. WARNING

SINCE THE FAILURE TO OBSERVE THE ABOVE SAFETY PRECAUTIONS COULD RESULT IN SERIOUS BODILY INJURY, INCLUDING DEATH IN EXTREME CASES, we recommend that you provide adequate instructions and warnings on your equipment; including labels setting forth the precautions listed above to the user of your product.

In setting forth the above listed recommendations with regard to precautionary steps that you must consider, we in no way intend to imply that if these steps are taken, your product will meet safety standards applicable to the product. We at Ametek are not sufficiently conversant with the specific safety hazards, which may be associated with your personal product. We can only advise you on precautions to be employed generally for the safe use of electric motors as components. For testing specifically related to the safety of your product, we recommend that you contact Underwriters' Laboratories, Inc, or other appropriate testing agencies as indicated by the type of product you manufacture.

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8.3 REPAIRS

Lamb Electric recommends that all repairs be made at its own service center. Warranty repairs must be returned through the original purchaser. For non-warranty repairs, return the motor to :

AMETEK-LAMB ELECTRIC DIVISION
Service Center
627 Lake Street
Kent, OH 44240

You will be quoted a flat repair charge for the non-warranty repair of the motor. Where brush change is required, the brushes should be changed BEFORE the brush shunt touches the commutator. On reassembly and handling, the lead wires must be kept away from rotating parts and motor frame.

To achieve best performance, the new brushes should be seated on the commutator before full rated voltage is applied. After brush change, apply 50% to 75% of rated voltage for thirty minutes to accomplish this seating. The motor will return to full performance after thirty to forty-five minutes of running at full rated voltage. The motor must not be run with the vacuum air inlet sealed off.

DIRECT APPLICATION OF FULL RATED VOLTAGE AFTER CHANGING BRUSHES WILL CAUSE ARCING , COMMUTATOR PITTING, AND REDUCED OVERALL LIFE.

If reduced voltage is unavailable, connecting two motors of similar rating in series for thirty minutes will accomplish the brush seating.

8.4 BRUSH LIFE

Normal brush wear is not covered under your warranty. Ametek-Lamb has stated that normal brush life is approximately 600 hours. Brush life however, is measured by the length of time that the motor is actually running, not in terms of the time the loader is turned on. Example: If the motor runs for 8 sec. a load cycle, multiply 8 sec. times the No. of load cycles per hour to get motor time/hour (example: 100 loads x 8 sec. divided by 3600) divide 600 by this figure (ex: $600 \times 3600 / (10 \times 8) = 2,700$ hours) to obtain brush life in terms of loader on time. Change brushes at or before this time. Damage to the commutator/armature due to worn brushes is not covered under warranty.

SECTION 9: PROXIMITY SWITCH INSTRUCTIONS

9.1: MOUNTING INSTRUCTIONS

This 30mm threaded unit is easy to mount with the two flat nuts provided. Or, use the optional accessories. When mounting using the threaded section/jam nuts, be sure to mount the unit well back of the center of the threaded area, towards rear, leaving side clearance to other objects/metal presence on the front half of the switch.

If sensing product through a non-metallic container, mount the switch flush to the hopper/side sight glass, etc. so that no air gap exists where possible.

SECTION 9.2: SENSITIVITY SETTING

As received, the Proximity Switch is set for maximum permissible detection range of 15mm (.6") based on a water target. The maximum range can be safely *reduced* by the built in sensitivity adjust. Do not use it to extend the range beyond the spec or non-stability will result.

Step 1: Mount the switch in the actual application and establish the worst case conditions that can cause a false "ON" signal. (For example, if sensing a material level through a sight glass, fill the glass and then reduce the level so moisture and residue clings to the inside of the glass.) If the LED is on, turn the pot CCW until it just goes off. If the LED is off turn the pot CW until it turns on, then back off just enough to make it go off.

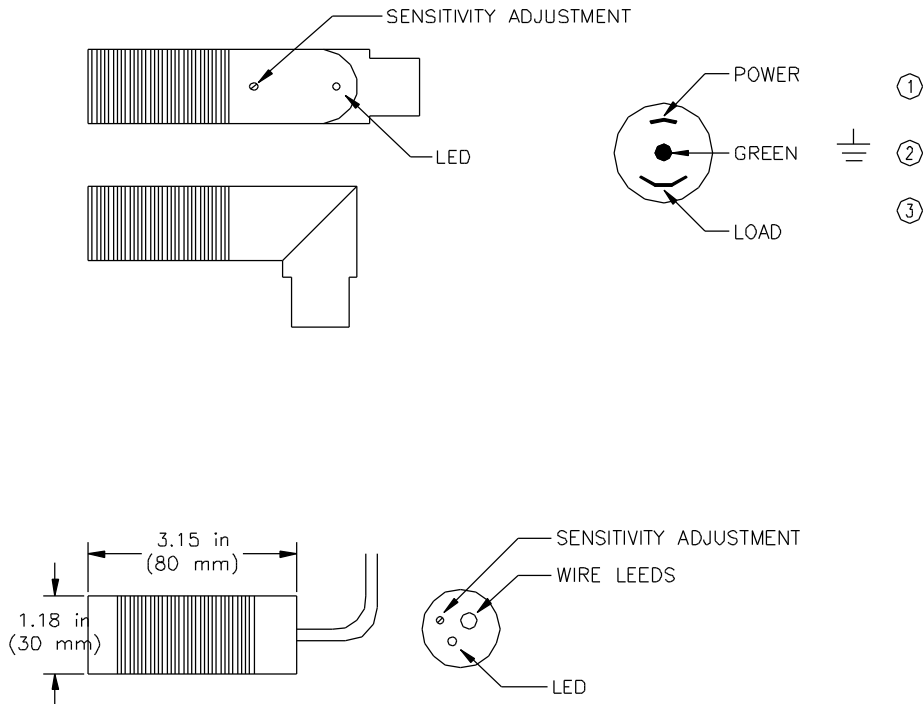
Step 2: Bring the target into position. (In the example, bring the material level above the switch.) The LED should now be on. Turn the pot CCW and count the number of turns until it goes off.

Step 3: Turn the pot CW for $\frac{1}{2}$ the number of the turns from Step 2. (In the example, if it took 4 turns to go from on to off, rotate the pot 2 turns CW.) The switch is now set in the midpoint of sensitivity range for maximum stability.

Note: If you have trouble during Step 2 (for example, when sensing lightweight materials) consult the factory for proper sensitivity adjustment.

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9.3: Proximity Switch



ALWAYS MINIMIZE THE AIR GAP AS MUCH AS POSSIBLE WHEN MOUNTING.

TO ADJUST THE SENSITIVITY:
TURN ADJUSTMENT SCREW CLOCKWISE TO INCREASE.
TURN COUNTER CLOCKWISE TO DECREASE.

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SECTION 10: MAINTENANCE SCHEDULE

WEEKLY

CHECK AND CLEAN OR REPLACE FILTERS

CHECK FOR UNUSUAL NOISE

CHECK SYSTEM FOR AIR LEAKS (HOSES, GASKETS, LOWER SEAL)

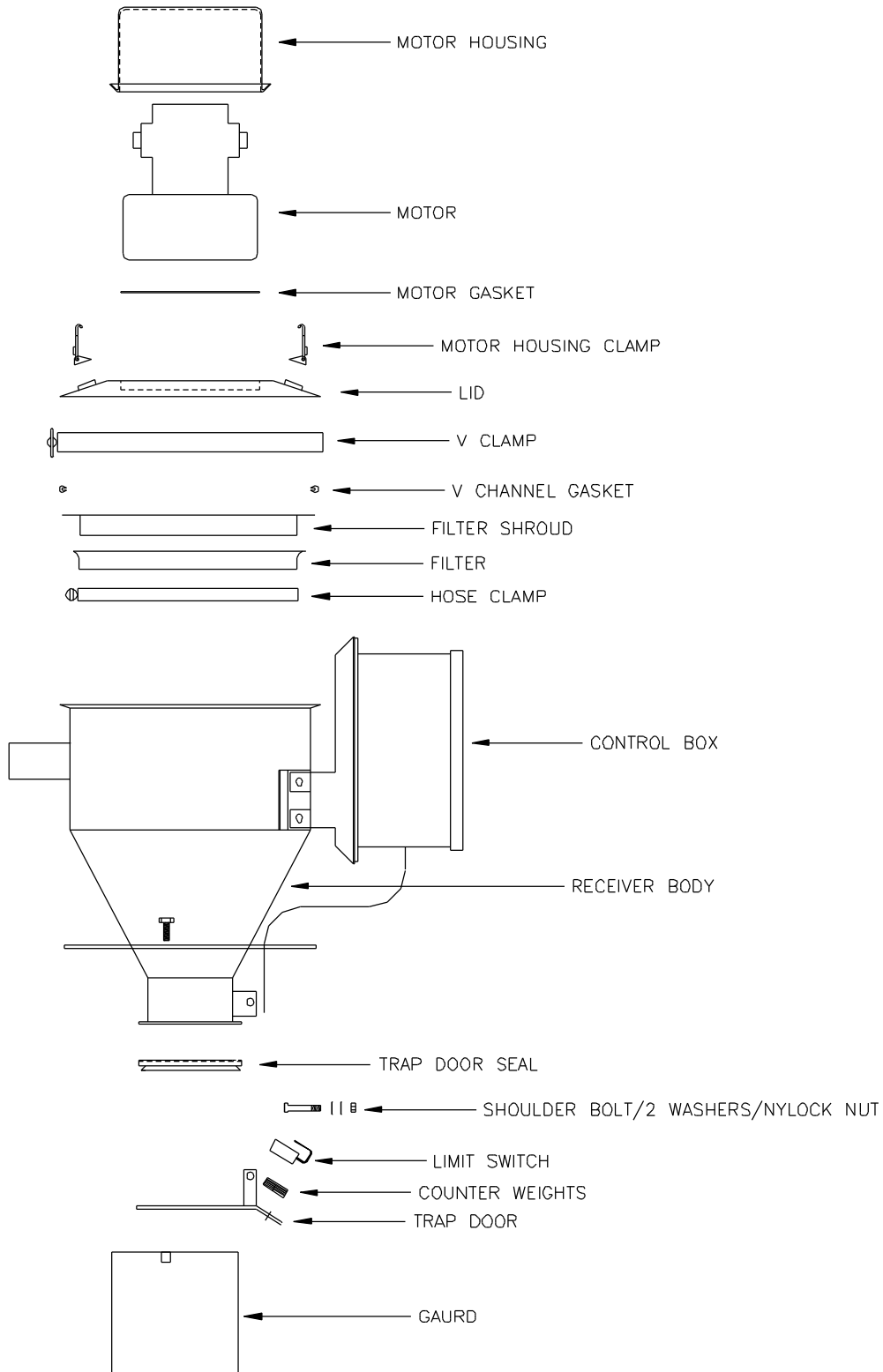
CHANGE BRUSHES EVERY 600 HOURS OF MOTOR RUN TIME.

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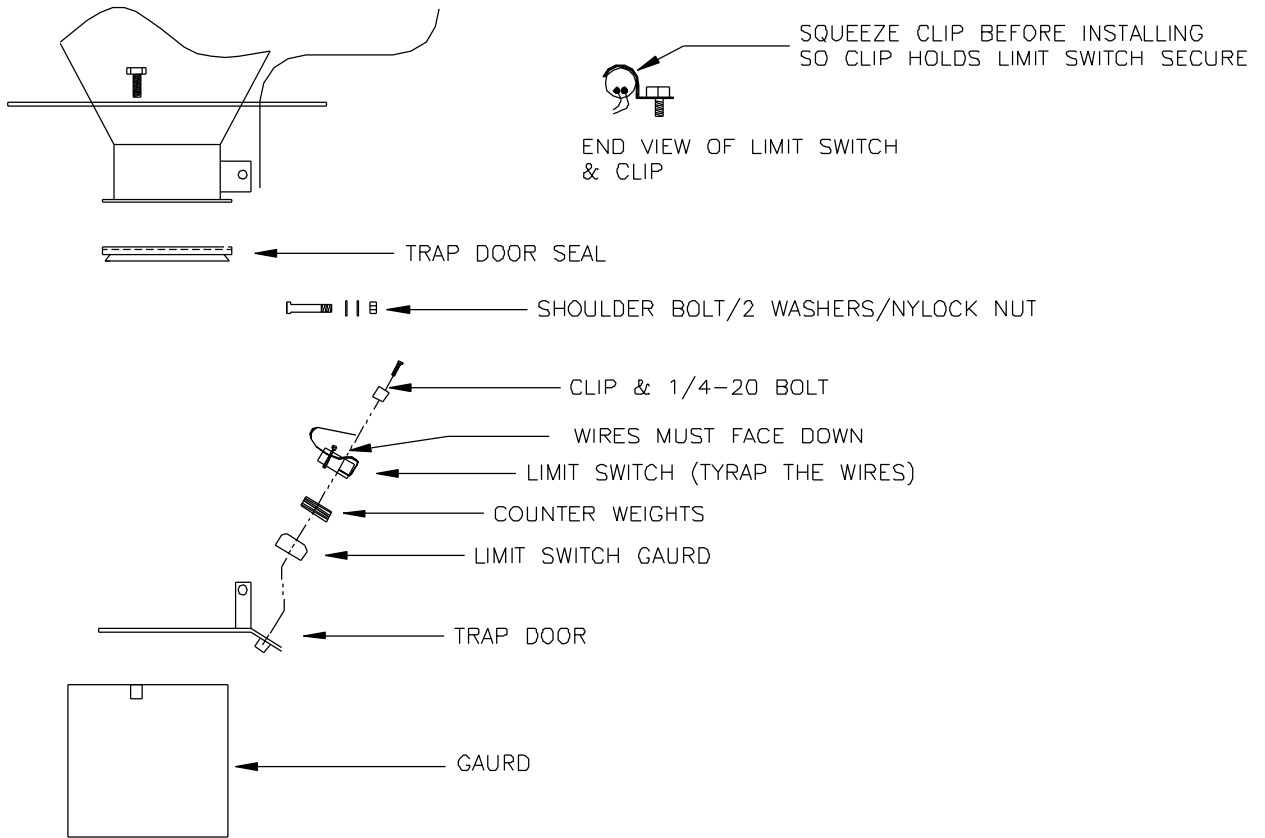
MODEL #	FILTER#	LID SEAL#	DOOR SEAL#	POPPET#	LID CLAMP#	MOTOR#	MOTOR CLAMP#
VL1-B	408053	409402	413091	NONE	405824	414020	
VL1-BR	408053	409402	413091	301954	405824	414020	
VM1-B JR	412432	412257-A	412265	NONE	2-411402	404365	2-405828
VM1-BR JR.	412432	412257-A	412265	301954	2-411402	404365	2-405828
VM1-B	408053	409402	413091	NONE	405824	404365	2-405828
VM1-BR	408053	409402	413091	301954	405824	404365	2-405828
VM-2	401354	409401	413091	NONE	407409	407893	2-405828
VM-2R	401354	409401	413091	301954	407409	407893	2-405828
ML-1	412432	412257-A	NONE	NONE	2-411402	404365	2-405828
ML-1R	412432	412257-A	NONE	301954	2-411402	404365	2-405828
ML-2	408053	409402	NONE	NONE	405824	404365	2-405828
ML-2R	408053	409402	NONE	301954	405824	404365	2-405828
ML-3	408053	409402	413091	NONE	405824	404365	2-405828
ML-3R	408053	409402	413091	301954	405824	404365	2-405828
ML-4	401354	409401	413091	NONE	407409	407893	2-405828
ML-4R	401354	409401	413091	301954	407409	407893	2-405828

MODEL #	LIMIT SWITCH#	TIMER	CONTACTOR	BLOW BACK SOL#	MOTOR BRUSH#
VL1-B	412060	413784	PART OF TIMER	406783	
VL1-BR	412060	413784	PART OF TIMER	406783	
VM1-B JR	412060	413784	PART OF TIMER	406783	2-406169
VM1-BR JR.	412060	413784	PART OF TIMER	406783	2-406169
VM1-B	412060	413784	PART OF TIMER	406783	2-406169
VM1-BR	412060	413784	PART OF TIMER	406783	2-406169
VM-2	412060	413784	PART OF TIMER	406783	4-406162
VM-2R	412060	413784	PART OF TIMER	406783	4-406162
ML-1	413670	413784	PART OF TIMER	406783	2-406169
ML-1R	413670	413784	PART OF TIMER	406783	2-406169
ML-2	413670	413784	PART OF TIMER	406783	2-406169
ML-2R	413670	413784	PART OF TIMER	406783	2-406169
ML-3	413670	413784	PART OF TIMER	406783	2-406169
ML-3R	413670	413784	PART OF TIMER	406783	2-406169
ML-4	413670	413784	PART OF TIMER	406783	4-406162
ML-4R	413670	413784	PART OF TIMER	406783	4-406162

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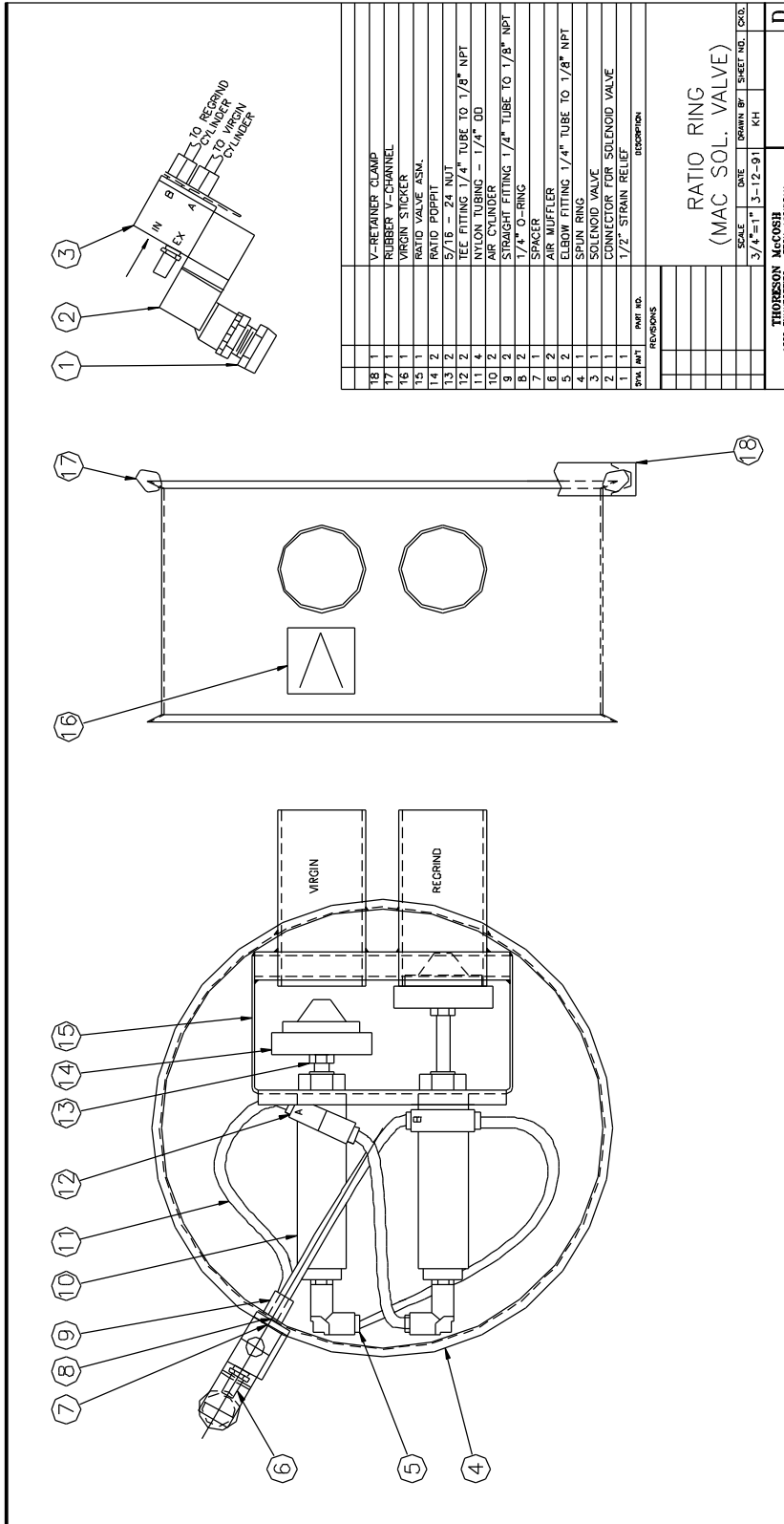


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TRAP DOOR INSTRUCTIONS

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MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

MERCURY

MSDS NUMBER: M1599 --- EFFECTIVE DATE: 07/09/2001

1. PRODUCT IDENTIFICATION

Synonyms: Quicksilver; hydrargyrum; Liquid Silver

CAS No.: 7439-97-6

Molecular Weight: 200.59

Chemical Formula: Hg

Product Codes:

J.T. Baker: 2564, 2567, 2569, 2572

Mallinckrodt: 1278, 1280, 1288

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS No	Percent	Hazardous
Mercury	7439-97-6	90 - 100%	Yes

3. HAZARDS IDENTIFICATION

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Thoreson-McCosh Inc.

Health Rating: 4 - Extreme (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Mercury vapor is highly toxic via this route. Causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, headache, muscle weakness, anorexia, gastrointestinal disturbance, ringing in the ear, liver changes, fever, bronchitis and pneumonitis. Can be absorbed through inhalation with symptoms similar to ingestion.

Ingestion:

May cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea. May be followed by a rapid and weak pulse, shallow breathing, paleness, exhaustion, tremors and collapse. Delayed death may occur from renal failure. Gastrointestinal uptake of mercury is less than 5% but its ability to penetrate tissues presents some hazard. Initial symptoms may be thirst, possible abdominal discomfort.

Skin Contact:

Causes irritation and burns to skin. Symptoms include redness and pain. May cause skin allergy and sensitization. Can be absorbed through the skin with symptoms to parallel ingestion.

Eye Contact:

Causes irritation and burns to eyes. Symptoms include redness, pain, blurred vision; may cause serious and permanent eye damage.

Chronic Exposure:

Chronic exposure through any route can produce central nervous system damage. May cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of the teeth, digestive disorders, skin rashes, brain damage and kidney damage. Can cause skin allergies and accumulate in the body. Repeated skin contact can cause the skin to turn gray in color. A suspected reproductive hazard; may damage the developing fetus and decrease fertility in males and females.

Aggravation of Pre-existing Conditions:

Persons with nervous disorders, or impaired kidney or respiratory function,

Thoreson-McCosh Inc.

or a history of allergies or a known sensitization to mercury may be more susceptible to the effects of the substance.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Undergoes hazardous reactions in the presence of heat and sparks or ignition. Smoke may contain toxic mercury or mercuric oxide. Smoke may contain toxic mercury or mercuric oxide.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from vapor. Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not

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generate misting. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Do not flush to sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker CINNASORB(R) and RESISORB(R) are recommended for spills of this product.

7. HANDLING AND STORAGE

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Do not use or store on porous work surfaces (wood, unsealed concrete, etc.). Follow strict hygiene practices. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Limits:

- OSHA Acceptable Ceiling Concentration:
mercury and mercury compounds: 0.1 mg/m³ (TWA), skin
- ACGIH Threshold Limit Value (TLV):
inorganic and metallic mercury, as Hg: 0.025 mg/m³ (TWA) skin, A4 Not classifiable as a human carcinogen.
- ACGIH Biological Exposure Indices:
total inorganic mercury in urine (preshift): 35 ug/g creatinine;
total inorganic mercury in blood (end of shift): 15 ug/l.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face respirator with a mercury vapor or chlorine gas cartridge may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with a mercury vapor or chlorine gas cartridge may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator

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supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Silver-white, heavy, mobile, liquid metal.

Odor:

Odorless.

Solubility:

Insoluble in water.

Density:

13.55

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

356.7C (675F)

Melting Point:

-38.87C (-38F)

Vapor Density (Air=1):

7.0

Vapor Pressure (mm Hg):

0.0018 @ 25C (77F)

Evaporation Rate (BuAc=1):

4

10. STABILITY AND REACTIVITY

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

At high temperatures, vaporizes to form extremely toxic fumes.

Hazardous Polymerization:

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Will not occur.

Incompatibilities:

Acetylenes, ammonia, ethylene oxide, chlorine dioxide, azides, metal oxides, methyl silane, lithium, rubidium, oxygen, strong oxidants, metal carbonyls.

Conditions to Avoid:

Heat, flames, ignition sources, metal surfaces and incompatibles.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

All forms of mercury can cross the placenta to the fetus, but most of what is known has been learned from experimental animals. See Chronic Health Hazards.

Carcinogenicity:

EPA / IRIS classification: Group D1 - Not classifiable as a human carcinogen.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Mercury (7439-97-6)	No	No	3

12. ECOLOGICAL INFORMATION

Environmental Fate:

This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material is expected to significantly bioaccumulate.

Environmental Toxicity:

This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l.

13. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. TRANSPORT INFORMATION

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

International (Water, I.M.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

International (Air, I.C.A.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

15. REGULATORY INFORMATION

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan	Australia
Mercury (7439-97-6)	Yes	Yes	No	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	DSL	NDL	Phil.	Canada
Mercury (7439-97-6)	Yes	Yes	No	Yes	

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302-	TPQ	-----SARA 313-----	List	Chemical
Catg.	RQ				

Thoreson-McCosh Inc.

Mercury (7439-97-6) No No Yes No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA-	-TSCA-
Mercury (7439-97-6)	1	261.33 U151	8(d) No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 2Z

Poison Schedule: S7

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**

Label Hazard Warning:

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases

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get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

Disclaimer:

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