FORWARD

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:

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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. _____

Layout No. _____

Table of Contents

Section 1: THORESON McCOSH PRODUCT WARRANTY

Thoreson McCosh warrants each product of it's manufacture to be free from defects in material and workmanship for a period of one (1) year 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: VACUUM LOADING SYSTEMS INSTALLATION

2.1 Introduction

Thoreson-McCosh Vacuum Loading Systems provide efficient loading of granular and dry powder materials with a minimum of maintenance. The power unit can be located at floor level for easier maintenance. Up to 32 vacuum receivers, either single component or dual component (ratio), can be used in any combination with Bear Bones controls.

2.2 Method of Operation

The operation of the vacuum loader is quite simple and basically similar to existing vacuum loaders. The positive displacement air pump creates a "vacuum effect" when the pump is driven. This vacuum results in air flow through the vacuum hose, creating a reduced pressure in the vacuum receiver, which causes the discharge valve on the material outlet of the receiver to close, causing a further reduction in pressure within the receiver. The reduced pressure within the receiver results in air flow through the pick-up tube, the material delivery tube and into the vacuum receiver. The high velocity of this air flow results in material pickup, and the consequent delivery of a mixture of material and air into the receiver. Once this mixture is delivered to the receiver, the material and air must be separated, and the air pumped out of the receiver to maintain the reduced pressure necessary for conveying. The separation of the air from the material is accomplished by the fabric dacron self-cleaning filter media, or in the case of the floor mounted filter, by a filter screen in the receiver, The filter will eliminate particle sizes down to three microns.

2.3 Installation and Setup

The loader will perform best when the material and vacuum lines are hooked up in the most direct manner possible with a minimum of bends. Care should be taken to insure that all the couplings are tight in order to minimize air leakage. On long system (over 50 feet), or systems exposed to vibration, it is best to apply sealant such as G.E. or Dow RTV silicon rubber which will establish a seal and/or the joints may be wrapped with vinyl tape to provide sealing and still remain flexible enough to maintain the seal if the joint is exposed to vibration.
The vacuum receiver should be mounted on the lid of the machine hopper over a circular hole and secured to the lid of the machine hopper by bolting through the mounting holes in the receiver flange.
The vacuum line is to be connected from the top of the receiver to the central vacuum line or the inlet on the filter housing. The material line is to be connected from the inlet on the side of the receiver to a central material line or a material pick-up tube.

The T-valves, or Asco valves require compressed air to operate. If a ratio receiver is being used, a source of compressed air is required in order to operate the ratio valve. The pressure of the air should be regulated between 60 psi and 90 psi in order to obtain maximum valve operation durability. This regulated air supply should be connected directly to the solenoid valve.

2.3.1 Blower Rotation

Before loading plastic with your loading system, be sure the blower is rotating in the proper direction on the unit. If the direction is incorrect, simply interchange any two of the three power leads (L1,L2, L3). The unit is now ready for operation.

2.3.2 Standard Controls Wiring

Run 4 wire, 18 awg conductor (for 24 VAC systems, 16 awg for 110 VAC systems) from the handy box mounted on the vacuum control valve (either a T-valve, or an Asco valve assembly) to the control panel. Carefully examine your wiring diagram before connecting any wiring. The receiver limit switch and the vacuum control valve are connected at the handy box and at the PLC in the control panel. Connect from the control panel to the control box mounted on the pump as indicated on the print titled "Remote Starter Box".

Note: See SK-88018-A for Standard Wiring Diagram Installation

Section 3: ACCESS BEAR

3.1 Introduction

This is the Access Bear Module (PIC-AB-01). It is used to set the load time for the selected station.

3.2 Method of Operation

When the Access Bear is first powered up, it will display a **01** . This is station 1. To select a different station, press the *up* or *down* arrow to increase or decrease the station number.
To change a timer value, select the station that you want to change, then press the ***SELECT*** button. This will give you **000**. Press the ***ACTUAL/SET POINT*** button. This will show you the timer value and the first digit will be flashing. Press the select button to move the flashing digit to the position that you want to change. To change the value of that digit, press the up or down arrow to increase or decrease the value of the digit. When you are done with the changes, press the ***ACTUAL/SET POINT*** button. This will bring you back to the actual time. Press the ***SELECT*** button again to return to the station display.

The Access Bear has 32 stations that can be selected. If the unit is only set-up for say a 14 station, the remaining stations should be set to off or have a load time of 000.
To set to off, select the station to change, then press the ***SELECT*** button then press the ***ACTUAL/SET POINT*** button. The left digit will flash. Press the down button until the value is 0, then press the down button one more time. This will change the display to ***OFF*** and the display will flash. Press the ***ACTUAL/SET POINT*** button again and the display will return to the actual setting. Notice that when you select a station, the top two lights on the left will alternately flash.

3.3 Sequence of Events

To load a station, turn the switch for that station on and if the limit switch, (located at the receiver) is closed, the Pump and the station T-Valve will energize and the station will load for the time set in the Access Bear. When the station times out, the next station that is turned on and that is calling for material will load. After all stations have loaded, the pump will turn off and after a short delay, the central filter will be cleaned either with compressed air or the pump will reverse. There will be another short delay and the sequence will repeat.

Section 4: FILTER MAINTENANCE

Filter specifications:

9" Filter	12# Receiver	408053
15" Filter	45# Receiver	401354
15" Filter	70# Receiver	401354

It is recommended that filters be checked periodically for material residue accumulation, and cleaned before the loader's performance is reduced.

1. Inspect and clean the filter screen in the receiver hopper at least once a month, (more often if dusty materials are being conveyed).

2. If a central filter is being used, inspect the filters in the unit at least once a month.

3. Inspect the filter on the power unit Monthly, These are cartridge type filter elements and may be cleaned with compressed air several times before a new element must be installed. When filter material becomes worn, a new filter should be installed. Replacement filters are available from **Thoreson McCosh, Inc.**

Section 5: PUMP MAINTENANCE

1. Add fresh oil to the blower as required to maintain proper oil level. (See blower maintenance manual for correct procedure).

2. The gear case of the blower should be drained, flushed and refilled with fresh oil every 1500 hours. Use a good grade of SAE 40 oil. We recommend SHELL ROTELLA 2F1908 or equivalent.

3. The grease fittings on the shaft end of the blower should be charged with a medium type bearing grease every 500 hours.

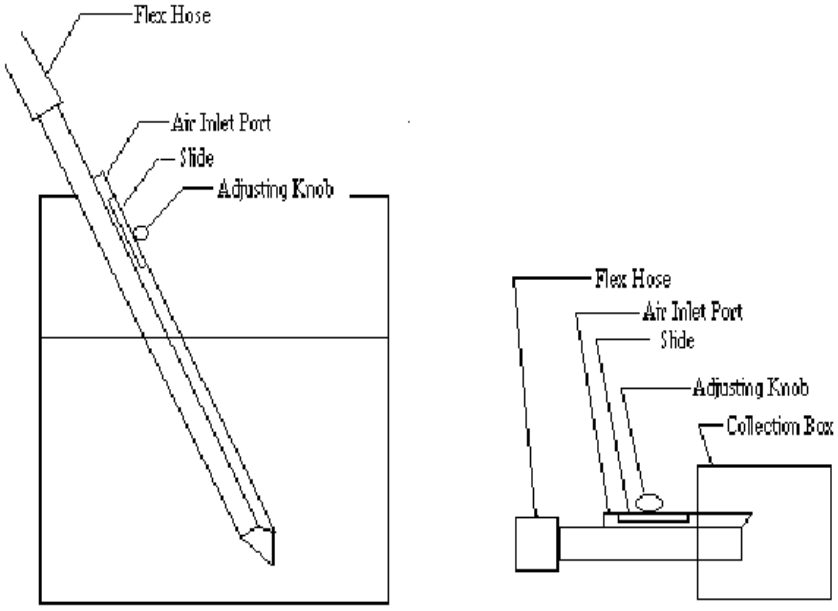
4. Check the belt periodically for tension and wear.

Section 6: MATERIAL PICK-UP TUBE

The material pick-up tube/vacuum take-off has an adjustable slide to regulate the material conveying air. The material is aerated at the bottom of the tube so that various densities of materials can be handled with one pick-up tube/vacuum take off.

The pick-up tube should be positioned at or near the bottom of the container. The loading rate should have a continuous noise of material passing through the conveying pipe as long as the loader is in operation.

If slugging occurs, the slide is incorrectly adjusted. To correct the problem, adjust the slide to let more air pass through the air inlet port.



Section 8: TROUBLE SHOOTING CHART

Symptom	Possible Cause	Remedy
Loss of vacuum	1. Dirty filters	Inspect and clean the Filters in the receiver and The power unit. Replace if Necessary. Check the compressed air for the blowback.(CB only)
	2. Leak at receiver seal	1. Increase the tension on the clamp. 2. Replace lid seal.
	3. Couplings or hose clamps on the material or vacuum lines are loose and leaking.	Tighten couplings and hose clamps.
	4. Pump belts loose.	Tighten or replace belts.
	5. Pump or motor damaged.	Repair or replace damaged unit.

Section 8: Auxiliary Maintenance Part 1: Loaders and Blenders

By: Merle Snyder, Managing Editor
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Maintaining loaders is generally a straightforward business-finding and fixing material-line leaks, changing filters, replacing worn motor brushes, checking V-belts for wear and tension, and similar tasks. Another simple yet critical maintenance task is making sure all vacuum pumps, blowers and electric motors are properly lubricated. Timely attention to these matters - often neglected as some examples below illustrate - would prevent common but readily avoidable production problems.

Loaders

Approaches to maintaining pressure and vacuum systems are very similar. The main difference in the two systems is their reaction to leaks in the material line. While both systems will lose conveying capacity with a leak, the pressure-system leak is much easier to find. Unless you happen to be standing directly under a break when it occurs, the unexpected appearance of plastics in the air will be a welcome clue to the location of a leak. If you're using snow shovels to remove piles of material from around your machinery, as personnel in one plant had to, you're probably ignoring leaks when they occur.

Personnel with sharp eyes, good hearing and a basic understanding of the equipment and the most important elements of your maintenance program. Do you and your people know what the machine is supposed to do? Do you know the correct sequence of operations? What do the indicator lights mean? Should they blink? If several lights are on the panel, should they blink in sequence? What did the machine sound like when new or when you saw it demonstrated? If it doesn't sound the same now, find out why. Let your eyes and ears lead you to the problem. The sound of a well-running system can be music to a mechanic's or technicians ears. Obtain this kind of music lessons for yourself and your staff.

For example, a chattering or hissing sound near the power unit probably comes from a relief valve. If the sound is constant, the system is being overloaded by blocked lines or the valve is out of adjustment. Another common problem is easily heard and almost always incorrectly analyzed. If the pump sounds like it is slowing down under a load, perhaps when it pulls material from certain locations, it is not because you need a pump with more horsepower. This change in pitch is the pump slowing down all right, but it is being driven by a three-phase motor; and if you were slowing down the three-phase motor you would blow a fuse or kick out an overload. The problem? A loose belt. Take off the belt guard and your eyes will verify what you heard. There will be a pile of

black rubber dust under the belt sheaves. Tightening or replacing the belt is in order.
The eyes are even more useful in machine maintenance once a person knows what to look for. Spending a few minutes in front of the control panel each week will enable you to spot most problems before they cause a shutdown. Does the same station keep calling for material every cycle? It may have a malfunctioning level switch or dump valve. Does only one station load well and the rest constantly fall behind? Check the vacuum-control valve on the good station. It is probably leaking when turned off. When you're near the power unit, take a look at the vacuum and pressure gages supplied with it.

Finding Leaks

If you look at vacuum or pressure indicators on a regular basis, you'll know what the normal reading is for your system and you'll see when it changes. Finding a vacuum leak is a time consuming maintenance procedure, but correcting leaks preserves your pumps and reduces unscheduled downtime.

To find in the vacuum system, a vacuum gage with a hose (like the ones car mechanics use) and a piece of heavy cardboard ar required. Remove the vacuum hose from the pump. Take a reading by blocking the pump inlet with the cardboard and putting the hose from the gage through a hole pierced through the middle of the cardboard (don't use cardboard above the 2½" line of the pump inlet; get something more rigid). This will tell you two thing: the maximum vacuum available and the vacuum relief valve setting. Check these against the manufacturers specs. Now check the vacuum at the material pick-up point in question. A normal vacuum loss would be 1 to 3 inches of mercury on a 250' conveying distance. If the gage moves up very slowly to a"good" reading, you still have a leak. the gage should be up to a full reading in a few seconds, not 20 or 30. Remove a coupling in the middle of the material line and take another reading. Immediately you'll know if the leak is in the first or second half of the line. Just repeat the process until the leak is found.

Other parts of the loading system require attention as well. One auxiliary OEM reports that hopper loaders, out of all the equipment it manufactures, come in for the most neglect and mistreatment. On one service call, the processor un-diplomatically described the OEM's hopper loaders as "junk". Upon examination of the loaders so described, the service manager found out that the brushes on the defective motor were completely worn out. But the worn out brushes had been installed only two months before. It turned out that the processor did not know how to"seat" replacement brushes. Seating, either manually or by means of reduced motor voltage helps to conform the brush surface to the commutator surface, increasing brush life.

Also, material level sensors on all three units were damaged. The units use a microswitch that is mechanically coupled via a spring rod to a aluminum paddle.

When the machine hopper is full, material presses on the aluminum paddle to shut the loader off. All three spring rods were bent and unable to sense a full machine hopper. This caused the units to run continuously, causing premature motor and brush failure.

In addition, cover gaskets on all the units were completely blocked with material fines. While the units, in this case, have a blowback feature that partially cleans the filter elements between cycles, this feature does not eliminate the need for periodic filter servicing. The blowback only lengthens the interval between servicing periods. Fatigued or torn filters con not only hamper the performance of the pneumatic conveying system, but could also be the cause of a blower failure or control-valve sticking, if the problem is not corrected.

One notable case of filter neglect occurred at a plant in the Southwest. the processor complained that his central loading system was not delivering enough plastic to his six injection molding machines. When the service manager disconnected the central vacuum line from the main pump, he noticed that the vacuum gage was excessively high.

The processor acknowledged that he never cleaned the main filter chamber protecting the main pump, saying he thought that the system's blowback feature eliminated the need to do so.

The filter assembly was located on an open-grate mezzanine. As the upper cover and filter bag assembly were being removed, the filter-bag assembly fell off the cover and struck the mezzanine. An unfortunate employee standing below the mezzanine was so covered in fine white plastic dust that he had to go home to shower and change clothes. The processor thereafter took up the habit of changing his filters ever two weeks.

Another auxiliary OEM tells of a processor that had been in business for approximately two years and had bought and extremely low number of spare filters. He would occasionally call the processor to ask if personnel had recently checked certain filters and regular maintenance items in the system.

To complicate matters, this was a new shop and it was supposedly making secret parts. The processor didn't want anyone in the shop after the initial installation and startup. When the OEM made a courtesy call, he could not get past the lobby. He would politely ask, "Can I please go out and check the system?" and was repeatedly denied entry.

Then came an emergency phone call: "We have overheated a blower. What do you think the problem is?" The OEM offered to bring a blower from stock to the plant immediately and volunteered to check the system over. The response? "No, we just want to know what you think is wrong and we'll fix the blower." The OEM recommended checking all the filters again and to make sure that there

were not any plugs in the vacuum lines, which would overheat the blower during the conveying cycle. Several months passed before the next panicky phone call: “We want that spare blower you have in stock. Please bring it down to us as soon as possible; and we would like you to look at the system.”

Upon arrival, he found that the processor had already dismantled the problem blower, which voided any warranty with the blower manufacturer. (It is a common mistake to take expensive thing apart without first checking the warranty. Many manufacturers who supply components to auxiliary OEM’s will give great leeway on expensive components, if the component OEM knows it has had a recurring manufacturing problem. The minute a processor opens up a piece of equipment, all that potential advantage is lost.)

Upon checking the filters, the OEM found that the filter in on central vacuum loader had a 2" hole in it. The vacuum line going to the safety filter had a plug of plastic about 4' long and 2" in diameter that had been sucked through that hold. It was virtually impossible for this system to run with such a largeamount of plastic in the vacuum line. Every time the vacuum was turned on, the plastic went into the safety filter and stopped the airflow. this caused the blower to run harder and harder and longer and longer, trying to get anything into the hopper it was supposed to be loading. Also, the processor had disconnected the alarm system because the alarm had been going off all the time. The problem was not detected when it should have been, which led to the repeated overheating.

Short Checklist:

Filters:	Change regularly
Hoses:	Check for leaks, fix promptly
V-Belts:	Adjust tension, replace if too worn
Pumps/Blowers	Lubricate regularly
Motors:	Replace brushes, seat properly
	Lubricate regularly
Control Panel:	Check lights and gages for normal readings
Sound Check:	Does machine sound normal in operation