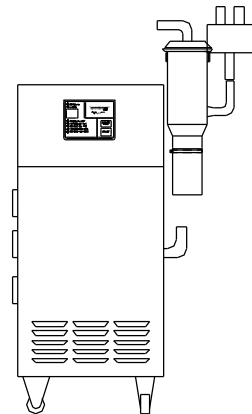
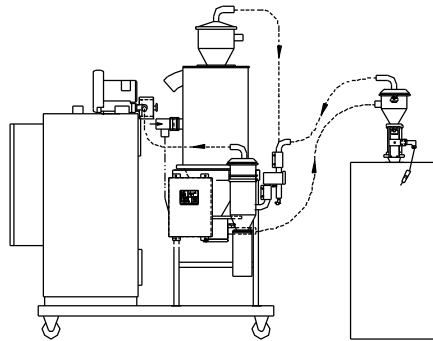
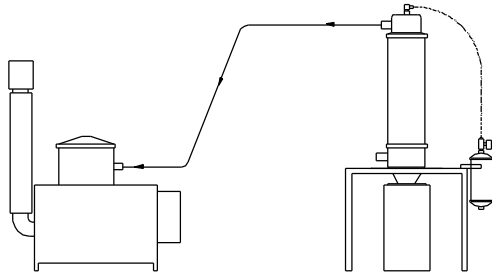


Thoreson-McCosh Inc

1 & 2 STATION LOADER PUMP, DVL & GUARDIAN

Standard & Tech 2 Controls



INSTRUCTION MANUAL

IB200702

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

The information contained in this Instruction Manual is provided to you for the maintenance of your Thoreson-McCosh Inc. 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
parts@thoresonmccosh.com

CUSTOMER RECORDS

Upon receipt of your Thoreson-McCosh Inc. 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 Inc. 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. _____

Insert No. _____

Program No. _____

Layout No. _____

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SECTION 1: THORESON-MCCOSH INC. 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: LOADING SYSTEM INSTRUCTIONS

2.1 INTRODUCTION

The Thoreson-McCosh Vacuum Loader provides an economical, low maintenance loading of granular, pellet and dry powdered materials with particle size down to three microns. The station loaders employ a self-cleaning fabric filter contained in the receiver housing or in a floor mounted filter unit. This filter is cleaned once every load cycle.

2.2 METHOD OF OPERATION

The operation of the Vacuum Loader is quite simple. Air pressure within the vacuum receiver is reduced when the pump 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 or filter screen, 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.

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

A Vacuum Receiver should be mounted on the lid of the drying hopper through a circular hole and fastened to the lid of the hopper through the mounting holes provided in the receiver flange. The material line can then be hooked up to convey material from its source to the receiver.

An MV unit should be mounted and fastened to the base plate on the machine throat. The material line can now be connected to the material inlet of the MV and to the material takeoff on the drying hopper.

The Receivers 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 hookup for the loading system varies by the type of system purchased. Pumps will need high power connected to the control enclosure or unit supplied disconnect. (always check local codes). The Receivers will need to have the limit switch or ratio plugs wired from the receiver to the control enclosure.

Most units require a minimum of 60-psi compressed air to clean the filter central filter (CB only), and to drive the Ratio solenoids.

2.4 BLOWER ROTATION

Before the loading system can be used, the blower rotation must be verified to be correct. Turn the power on to the pump, a vacuum should be felt at the filter. If the direction is incorrect, simply interchange any two of the three power leads (L1, L2, L3). The unit is now ready for operation

2.5 BLOWBACK

There are 2 different ways to clean or blowback the filter.

The first way is called RB or Reverse Blowback. After a load cycle, the pump will actually reverse its direction and blow air into the central filter or directly into each receiver.

The second way is called CB or Compressed air Blowback. After the load cycle, a solenoid valve, with compressed air attached, is energized. The compressed air is directed into the filter to remove the fines and material powder.

SECTION 3: CONTROLS

3.1 INTRODUCTION

The Vacuum Loader comes equipped with either **Standard** controls or optional **Tech 2** microprocessor controls with an operator interface panel.

3.2 STANDARD CONTROLS

A rotary timer is used to control the different functions of the loader. Generally, the first cam is used to control the length of time the pump is on. The second cam is used for the Blowback cycle. Depending on the type of blowback, there may be additional cams. A timer chart is enclosed for your particular pump and receiver set-up.

3.3 RATIO OPTION (STANDARD CONTROLS)

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.

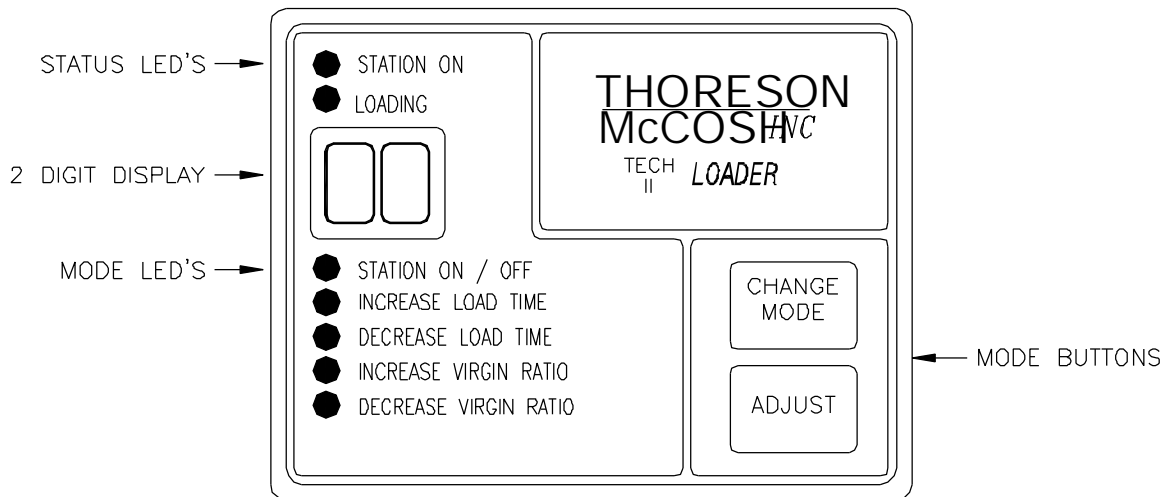
SECTION 4: TECH 2 MICROPROCESSOR CONTROLS

4.1 INTRODUCTION

The Thoreson McCosh Tech 2 Microprocessor controller makes the loading system much easier to use than ever before. Exact load times and ratio percentages are entered directly into the computer. A 2 digit display is used to show the remaining time left in a load cycle.

4.2 OPERATOR INTERFACE PANEL

The operator interface panel allows the user to program and monitor the receiver. With only two buttons, seven indicator LED's and a two digit information display, the interface is extremely easy to use and understand.



Status LED's: Shows the current receiver state. When the Station On LED is lit, the receiver is currently running through its cycles.

Display: This displays the information needed for the mode currently being used.

Mode LED's: These show which mode is currently being displayed. When no Mode LED's are on, the receiver is in the RUN mode.

Mode Buttons: Press these to change modes and adjust receiver set points.

4.3 SETTING THE DIPSWITCHES

With some programs, the dipswitches (SW1) need to be configured before using the Tech 2 controls.

#1) Number of loads before the blow back cycle.

OFF= 4

ON = 6

#2) Ratio

OFF= Normal

ON = Pulsating ratio (if load time is greater than 15 seconds)

- #3) Dump time
OFF= 15 seconds
ON = 25 seconds
- #4) Blow back
OFF= 4 seconds continuous
ON = Pulsating, 2 sec on, 2 sec off, 3 times
- #5) Number of stations
OFF= 1 station
ON = 2 station

4.4 OPERATION OF TECH 2 CONTROLS

There are 4 modes of operation;

RUN STATUS

STATION OFF/ON

INCREASE/DECREASE LOAD TIME

INCREASE/DECREASE VIRGIN RATIO

When the loader is first energized, the loader is in the RUN mode.

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.

4.5 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.

4.6 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.

4.7 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.

4.8 ADJUSTING STATION #2 SET POINTS

If the unit has 2 stations, the dipswitch #5 must be in the on position.

Station #1 mode LED's will be on constant.

Station #2 mode LED's will be flashing.

Press the **CHANGE MODE** button to cycle through all the station #1 modes, then the controller will come back to the station **ON/OFF** mode and the LED will be flashing. Adjust each of the modes for station #2.

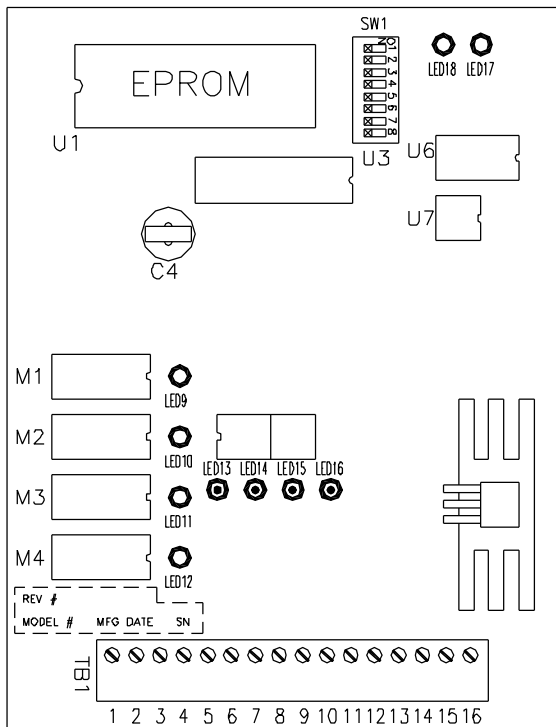
4.9 RUN MODE

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

The **STATION ON** LED will be on if the station was turned on, and when a station is loading, the **LOADING** LED will be on.

The display will show the current load time set point 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.

STATION CONTROL BOARD

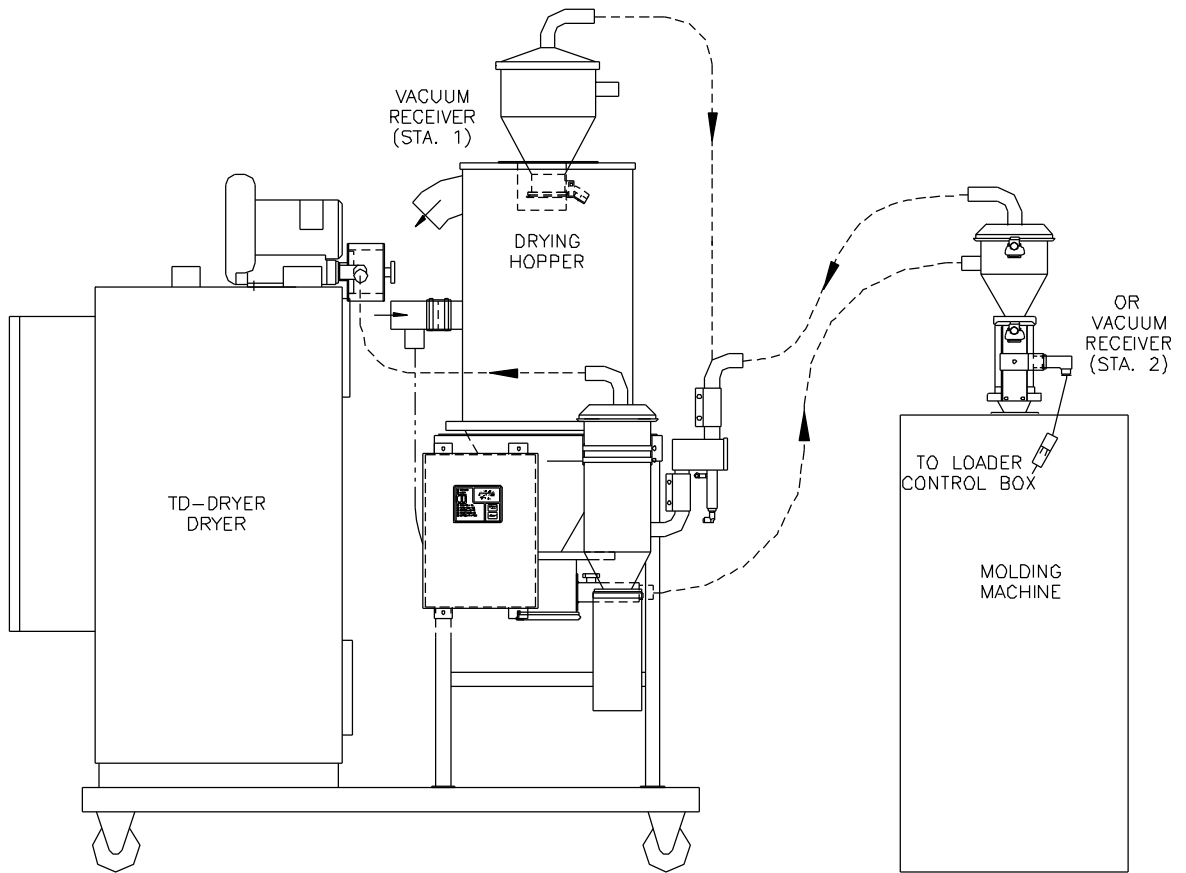


TB1

- | | | |
|----|--------|-------------------------------|
| 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 |

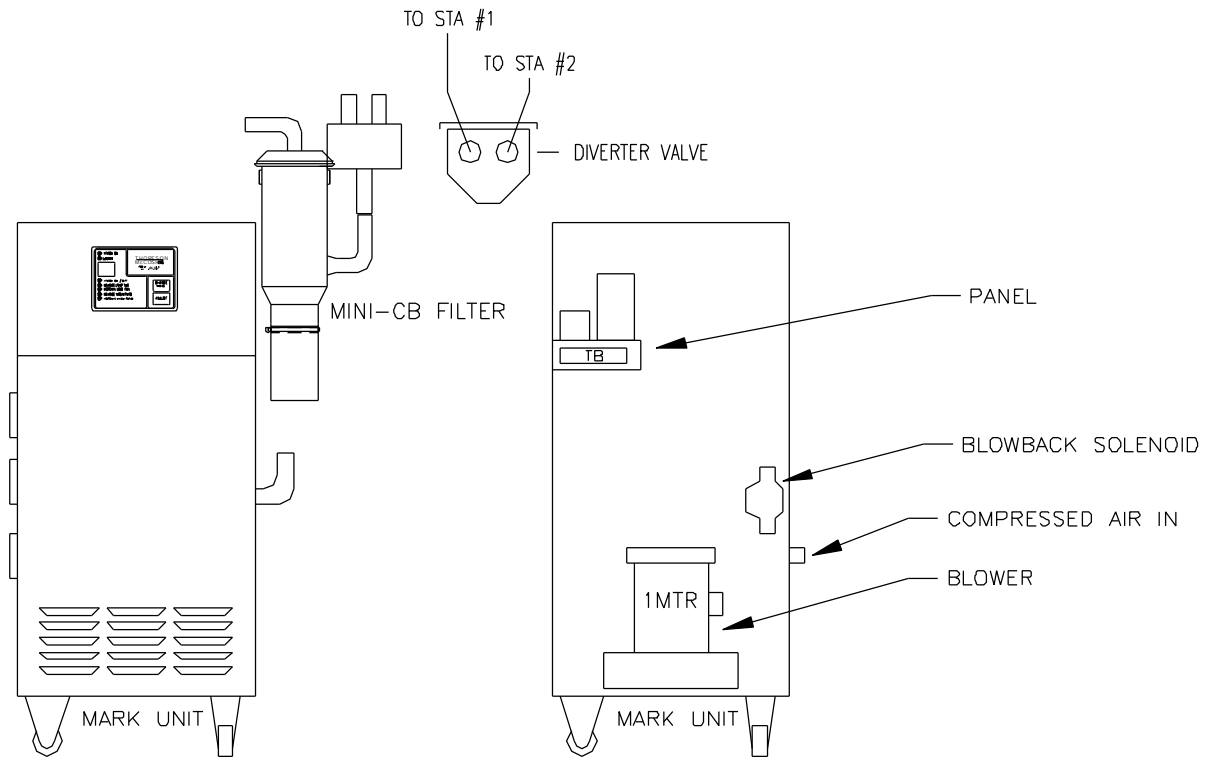
TYPICAL I/O LAYOUT

SECTION 5: DVL LAYOUT



TYPICAL DVL SET-UP

SECTION 6: GUARDIAN LAYOUT



TYPICAL GUARDIAN SET-UP

SECTION 7: MAINTENANCE

7.1: FILTER MAINTENANCE

- It is recommended that filters be checked periodically for material residue accumulation, and cleaned before the loader's performance is reduced.
- Inspect and clean the filter screen in the receiver hopper at least once a month (more often if dusty materials are being conveyed).
- If a central filter is being used, inspect the filters in the unit at least once a month.
- Inspect the filter on the pump weekly. 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.**

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"	412486	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.

7.2: PUMP MAINTENANCE

- Add fresh oil to the pump as required to maintain proper oil level. (See pump maintenance manual for correct procedure).
- The gear case of the pump should be drained, flushed and refilled with fresh oil every 1000 hours. Use a ISO grade oil or equivalent.
- The grease fittings on the shaft end of the pump should be charged with a medium type bearing grease every 500 hours.
- Check the belt periodically for tension and wear.

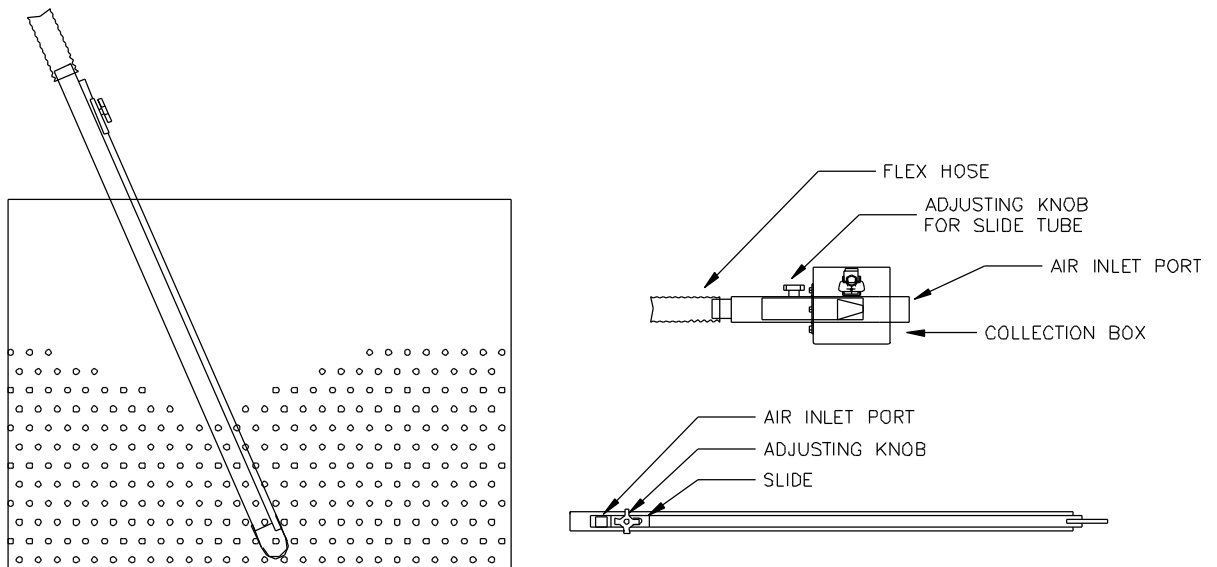
SECTION 8: MATERIAL PICK-UP TUBE / MATERIAL TAKE-OFF

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 airflow.

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.



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.

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.

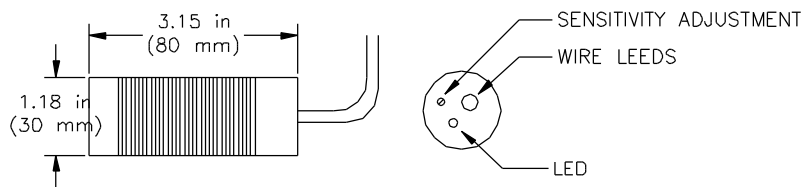
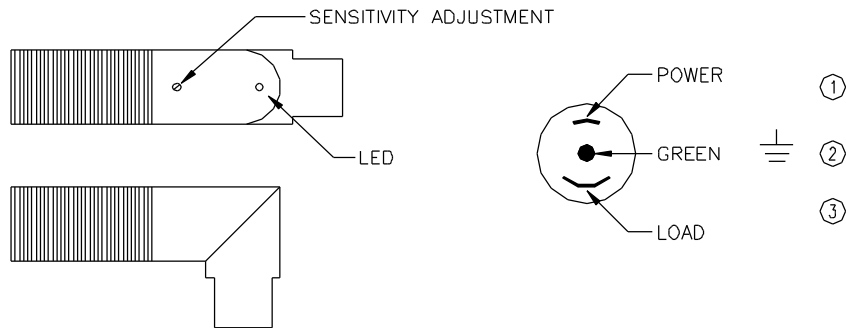
Step 1: Mount the switch in the actual application and establish the worst case conditions that can cause a false "ON" signal. (For example, if sensing a material level through a sight glass, fill the glass and then reduce the level so moisture and residue clings to the inside of the glass.) If the LED 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.

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.

60 HZ

MODEL	MARK 3	MARK 4	MARK 5	MARK 7	MARK 7XP	MARK 10	MARK 15
MOTOR MODEL	404369	404379	404370	410296	413946	1750	411678
MOTOR R.P.M.	1750	1750	1750	1750	1750	1750	1750
MOTOR H.P.	2	3	5	7.5	10	10	15
MOTOR FRAME	145T	182T	184T	213T	215T	215T	254T
MOTOR SHEAVE	1P3V45 (404787)	1P3V45 (404785)	2P3V56 (406046)	2P3V47 (404782)	2P3V47 (404782)	203V65	203V80
MOTOR BUSHING	P 7/8 (404542)	P 1-1/8 (404545)	P 1-1/8 (404545)	P 1-3/8 (405793)	P 1-3/8 (405793)	01-1 3/8	01-1 5/8"
MOTOR RAILS	(1) 1-K025 (408085)	(1) 3-K343 (408086)	(1) 3-K343 (408086)	(1) 3-K343 (408086)	(1) 3-K343 (408086)	3-K343 (408086)	1K207
BELT	(1) 3V475 (405784)	(1) 3VX500 (405785)	(2) 3VX500 (405785)	(2) 3VX500 (405785)	(2) 3VX475 (405784)	(2) 413111	(2) 413111
BLOWER (TUTHILL) (ROOTS)	2004-21 (414003)	3006-21 (414004)	3006-21 (414004)	4005-21 (414005)	4005-21 (414005)	5006-21(414006)	5006-21 (414006)
BLOWER R.P.M.	2400	3600	3600	4500	4500	5000	5000
BLOWER SHEAVE	1H3V33 (406043)	1P3V60 (404786)	2P3V47 (404782)	2P3V47 (404782)	2P3V47 (404782)	203V60	203V65
BLOWER (TUTHILL) BUSHING (ROOTS)	H 5/8 (404544)	P 7/8 (404542)	P 7/8 (404542)	P 7/8 (404542)	P 7/8 (404542)	01-1 1/2	01-1 1/8"
LINE SIZE	1.5	1.5	2	2	2.5	3.0"	3.0"
CFM	34	85.5	150	130	182	252	361
LINE VELOCITY	2764 PPM	6950 PPM	6880 PPM	5963 PPM	5359 PPM	5132 PPM	7352 PPM

NOTE: MOUNT SHEAVES AS FAR BACK ON SHAFTS AS POSSIBLE

50 HZ

MODEL	MARK 3	MARK 4	MARK 5	MARK 7	MARK 7XP
MOTOR MODEL	409989	409995	409978	410296	413946
MOTOR R.P.M.	1425	1425	1425	1425	1425
MOTOR H.P.	2	3	5	7.5	10
MOTOR FRAME	145T	182T	184T	213T	215T
MOTOR SHEAVE	1P3V69 (XXXXXX)	1P3V45 (404785)	2P3V56 (406046)	2P3V47 (404782)	2P3V56 (406046)
MOTOR BUSHING	P 7/8 (404543)	P 1-1/8 (404545)	P 1-1/8 (404545)	P 1-3/8 (405793)	P 1-3/8 (405793)
MOTOR RAILS	(2) 1-K025 (408085)	(2) 3-K343 (408086)	(2) 3-K343 (408086)	(2) 3-K343 (408086)	(2) 3-K343 (408086)
BELT	(1) 3V475 (405784)	(1) 3VX500 (405785)	(2) 3VX500 (405785)	(2) 3VX500 (405785)	(2) 3VX475 (405784)
BLOWER (TUTHILL) (ROOTS)	2004-21 (414003)	3006-21 (414004)	3006-21 (414004)	4005-21 (414005)	4005-21 (414005)
BLOWER R.P.M.	2400	3600	3600	4500	4500
BLOWER SHEAVE	1H3V33 (406043)	1P3V41 (407174)	2P3V46 (414141)	2P3V46 (414141)	2P3V46 (414141)
BLOWER (TUTHILL) BUSHING (ROOTS)	H 5/8 (404544)	P 7/8 (404542)	P 7/8 (404542)	P 7/8 (404542)	P 7/8 (404542)
LINE SIZE	1.5	1.5	2	2	2.5
CFM	34	88.8	140	132	182
LINE VELOCITY	2773 PPM	7225 PPM	6421 PPM	6068 PPM	XXXX PPM

REVISIONS

10-98	REDRAWN
011/00	MARK 7XP BELT
11/02	MARK 4&5 BUSHING ON SHEAVE WAS 2P-3V45
1/02	MARK 7XP-60HZ MOTOR

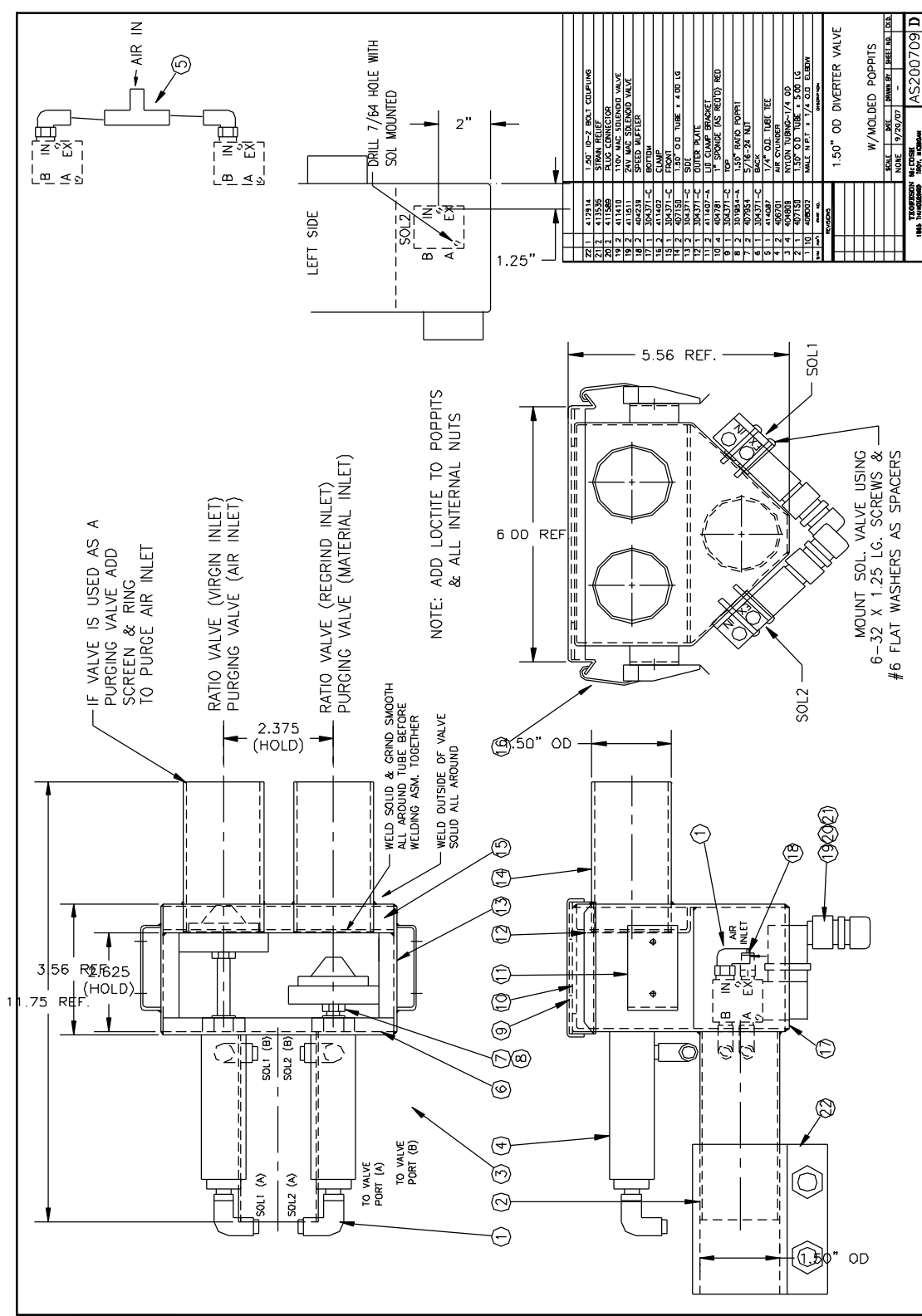
STANDARD POWER TRANSMISSION SPECIFICATIONS FOR MARK 3 THRU MARK 15 L88005D - L88006D - LA99002D

SCALE	DATE	DRAWN BY	SHEET NO.	ORIG DWG DATE
NOT TO SCALE	01-30-06	KH		5-10-88

THORESON McCOSH
1885 THUNDERBIRD TROT, MICHIGAN
PHONE 248-362-0960 FAX 248-362-5270

411395

B

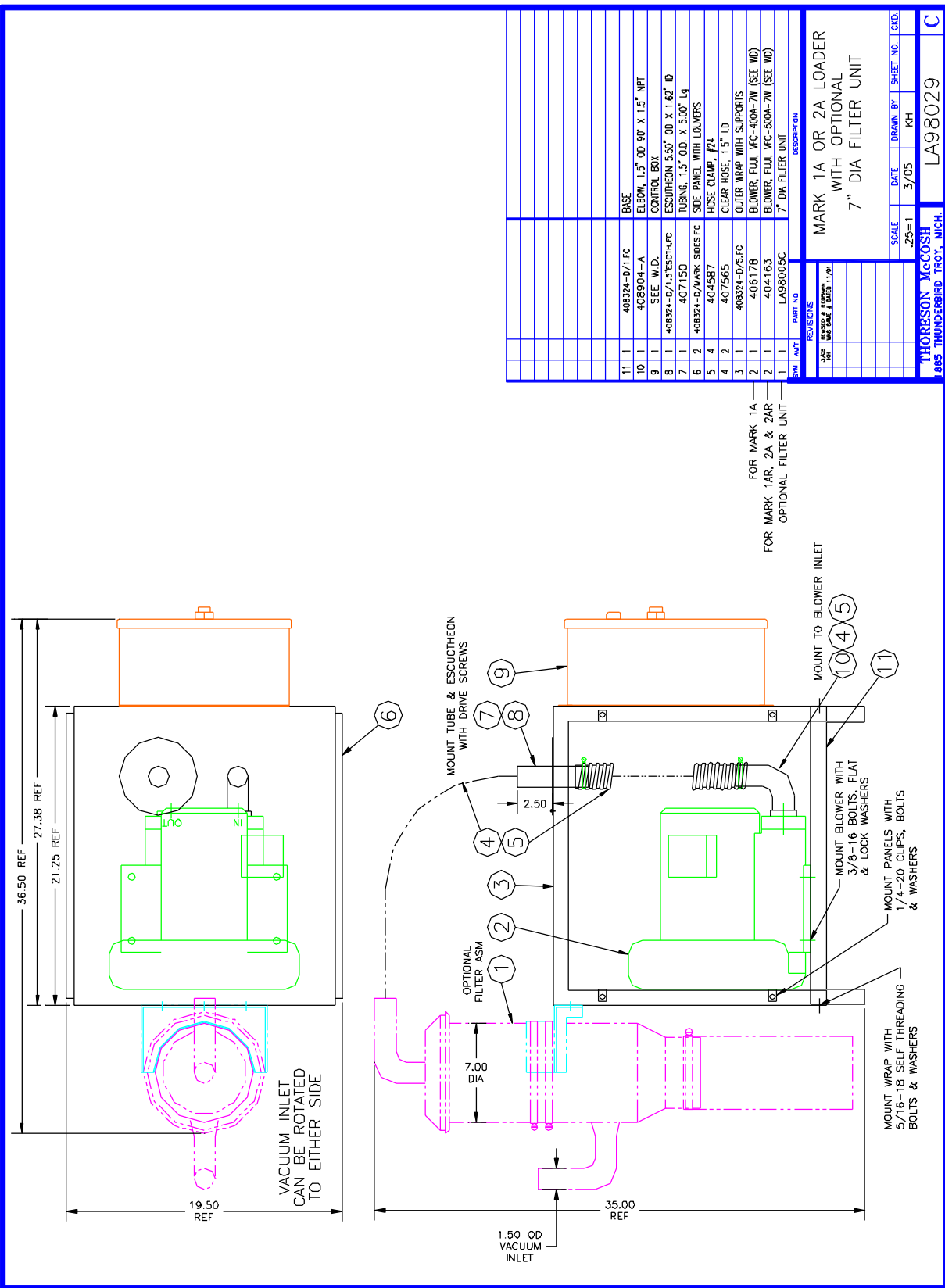


100% INSPECTION

DATE: 07/20/07

BY: [Signature]

AS2007091D



REV	DATE	BY	DESCRIPTION
11			408324-D/1FC BASE
10			408604-A ELBOW, 1.5" OD 90° X 1.5" NPT
9			CONTROL BOX SEE W.D.
8			408324-D/1.5TESCUHFC ESCUTCHEON 5.50" OD X 1.62" ID
7			407150 TURNING, 1.5" OD X 5.00" Lg
6			408324-D/MARK SIDESFC SIDE PANEL WITH LOWERS
5			404587 HOSE CLAMP, F24
4			407565 CLEAR HOSE, 1.5" ID
3			408324-D/SFC OUTER WRAP WITH SUPPORTS
2			406178 BLOWER, FUJI WFC-400A-7M (SEE MD)
1			404163 BLOWER, FUJI WFC-500A-7M (SEE MD)
1			LA98005C 7" DIA FILTER UNIT

REV	DATE	BY	DESCRIPTION
1			MARK 1A OR 2A LOADER WITH OPTIONAL 7" DIA FILTER UNIT

SCALE .25=1

DATE 3/05

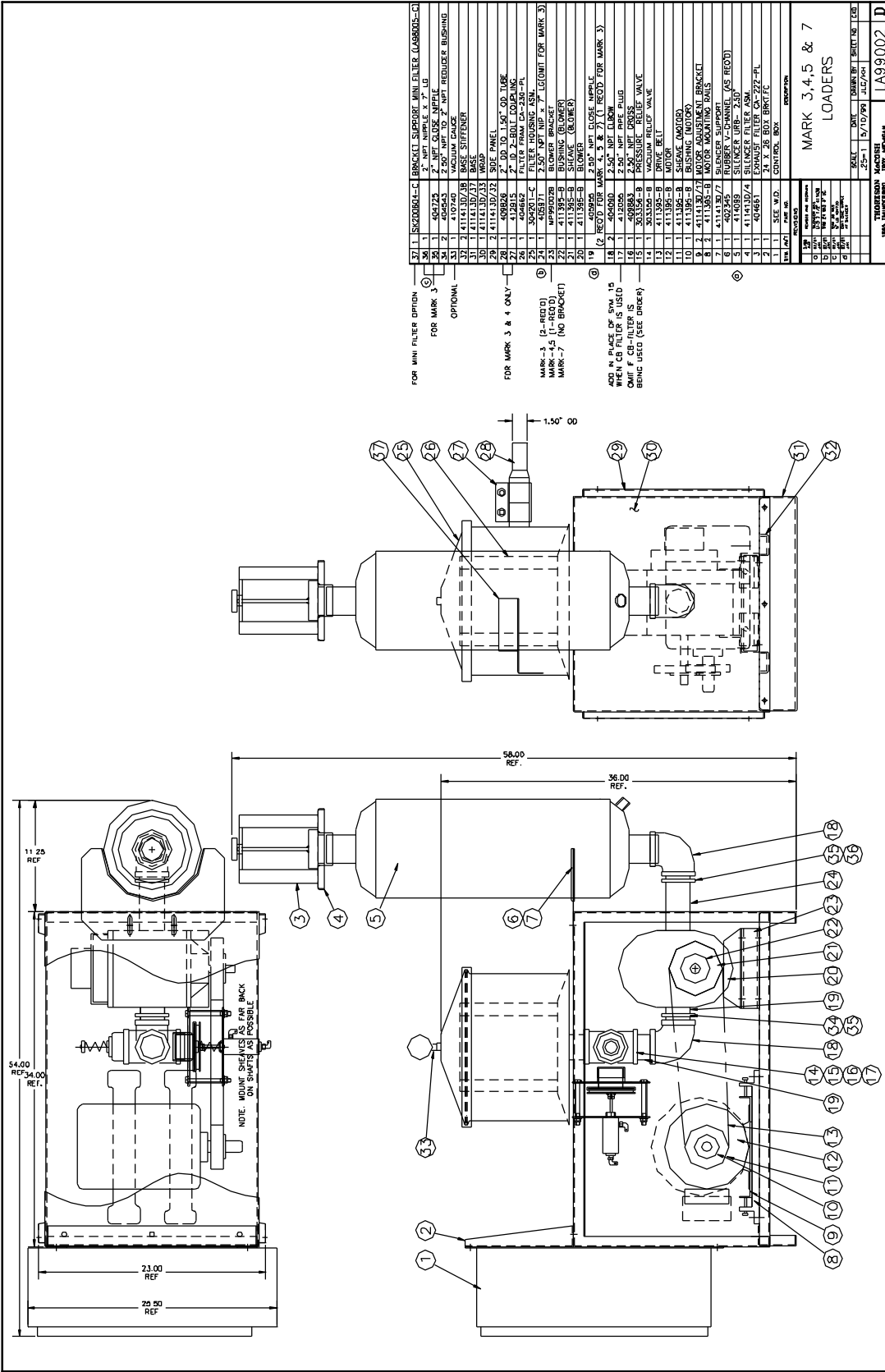
DRAWN BY KH

SHEET NO. C

THORSON MCCOSH

1885 THUNDERBIRD TROY, MICH.

LA98029



ITEM NO.	QTY	DESCRIPTION
37	1	BRACKET SUPPORT MINI FILTER (AS9000-C)
38	1	2" NPT CLOSE NIPPLE
39	1	2" NPT CLOSE NIPPLE
40	2	2" NPT CLOSE NIPPLE
41	2	VACUUM GAUGE
42	1	2" NPT REEDER BUSHING
43	1	2" NPT REEDER BUSHING
44	1	2" NPT REEDER BUSHING
45	1	2" NPT REEDER BUSHING
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97	1	2" NPT REEDER BUSHING
98	1	2" NPT REEDER BUSHING
99	1	2" NPT REEDER BUSHING
100	1	2" NPT REEDER BUSHING

MARK 3, 4, 5 & 7
LOADERS

DATE	15/10/99	J.L.C./M.H.
SCALE	25:1	
DRWING BY		
DRWING CHECKED BY		
DESIGNED BY		
APPROVED BY		
REVISIONS		
NO.	DATE	DESCRIPTION
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CAM TIMER ADJUSTMENT

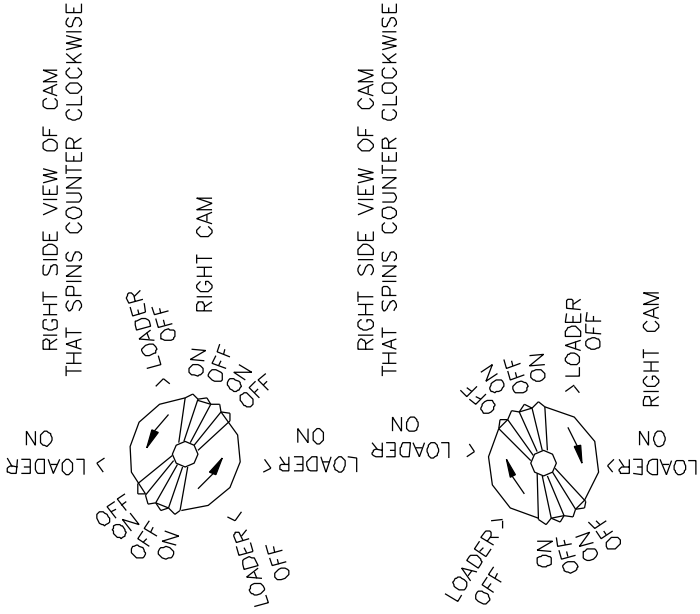
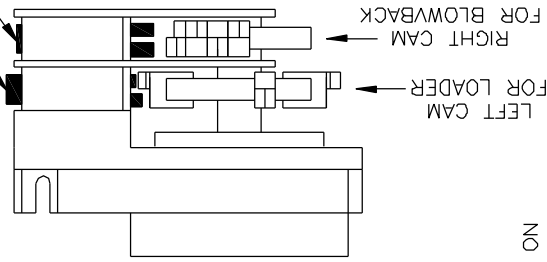
SK93086

A

- NOTE: 1) ALL CAM TABS ARE PRE-SET AT THORESON McCOSH
- 2) BLOWBACK SHOULD BE OFF WHEN LOADER IS ON

WHEN RED TAB IS UP
LOADER IS ON

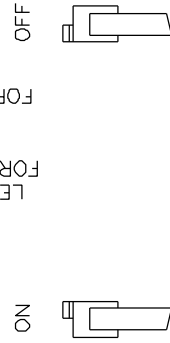
WHEN RED TAB IS DOWN
BLOWBACK IS OFF



1 MIN TIMER
1 SEC IS 1 CLICK

NOTE:

3 MIN TIMER
1.6 SEC IS 1 CLICK



SYM.	AM'T	DESCRIPTION	PART NO.
		CAM TIMER ADJUSTMENT	
THORESON McCOSH			
1885 THUNDERBIRD ST. TROY, MICHIGAN			
SCALE	DATE	DR. BY	DRAWING NO.
1.33	12/1/93	JLG	SK93086-A

MK.	DATE	DESCRIPTION
		REVISION

