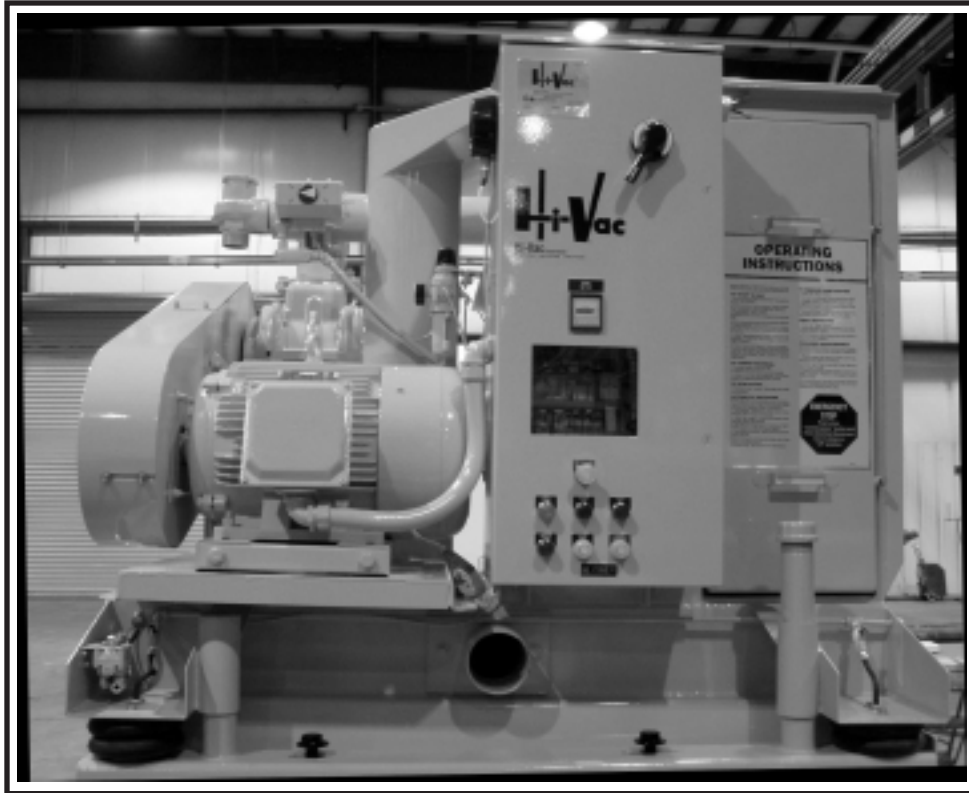


HV-5376 230 SERIES

Hi-Vac®



OPERATION

PARTS

& SERVICE

MANUAL

Hi-Vac Corporation
117 Industry Road
Marietta, Ohio 45750

Corporate: Tel: 740.374.2306 - Toll Free: 800.752.2400 - Fax: 740.374.5447
Web: www.hi-vac.com - E-mail: sales@hi-vac.com

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INSPECTION PROCEDURES

All pieces received should be inspected for damage immediately upon receipt.

1. Damage can be most easily detected by looking for scrapes on the paint.
2. Inspect all sheet metal and structural steel for damage such as bends, kinks or breaks.
3. Check all wiring for abrasions, cuts, cracks, etc. If any are found, repair or replace before connecting to power source.
4. Check all conduit runs and fittings for defects.
5. Check motor and vacuum pump for free rotation before starting under power for the first time after installation.
6. Compare the packing list attached to each piece of each shipment.
7. Verify the number of pieces and description of each piece shown on the packing slip.

REPORT ANY DAMAGE, NO MATTER HOW SLIGHT, IMMEDIATELY TO:

**Hi-Vac® Corporation
117 Industry Road
Marietta, OH 45750
Attention: Service Department
Phone: 740.374.2306
Toll Free: 800.752.2400
Fax: 740.374.5447**

Storage of your Hi-Vac® Unit

Allow machine to be crated if at all possible while storing for short or long term durations.

1. For short-term storage. (30 days or less)
 - A. Rotate shafts every two to three weeks to avoid flat spotting of the ball bearings.
2. For storage over 30 days
 - A. To prevent damage due to corrosion, oxidation, etc., Refer to the maintenance manuals for each component.
 - B. Make sure that the inlets to the piping manifold system are covered with the dust plugs to prevent foreign objects from entering the system.
 - C. Add packages of desiccant to all electrical enclosures on sides of Hi-Vac®.
 - D. Turn off the compressed air supply to the Hi-Vac® and relieve any pressure in the compressed air lines on the unit.



WARRANTY

Hi-Vac® CORPORATION WARRANTS TO THE ORIGINAL PURCHASER OF THE **Hi-Vac**® UNIT QUOTED HEREIN THAT THE **Hi-Vac**® UNIT SHALL BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USE AND SERVICE. **Hi-Vac**® CORPORATION DOES NOT WARRANT COMMERCIAL ITEMS MANUFACTURED BY OTHERS SUCH AS DIESEL ENGINES, TRUCK CHASSIS, TIRES OR MOTORS. IN ADDITION, **Hi-Vac**® CORPORATION DOES NOT WARRANT THE REPLACEMENT OF ANY OF ITS PRODUCTS OR COMPONENTS AS A RESULT OF FAILURE DUE TO CORROSION. **Hi-Vac**® CORPORATION'S OBLIGATION UNDER THIS WARRANTY SHALL BE LIMITED TO THE REPAIR OR EXCHANGE OF ANY PART OR PARTS WHICH MAY PROVE DEFECTIVE UNDER NORMAL USE AND SERVICE WITHIN THE SHORTER PERIOD OF **TWO (2) YEARS OR FOUR THOUSAND (4,000) WORK HOURS** FROM THE DATE OF DELIVERY TO THE ORIGINAL PURCHASER AND WHICH **Hi-Vac**® CORPORATION'S EXAMINATION SHALL DISCLOSE TO ITS SATISFACTION TO BE DEFECTIVE. THIS WARRANTY REQUIRES PURCHASER TO OPERATE THE **Hi-Vac**® UNIT IN STRICT COMPLIANCE WITH THE PRINTED INSTRUCTIONS AND TO SERVICE THE **Hi-Vac**® UNIT ACCORDING TO THE METHODS AND SCHEDULES CONTAINED IN THE **Hi-Vac**® UNIT'S MANUAL. EVIDENCE OF PURCHASER'S SCHEDULED MAINTENANCE MUST BE REPORTED IN WRITING TO **Hi-Vac**® CORPORATION ON THE FORMS SUPPLIED TO PURCHASER IN THE **Hi-Va**® MAINTENANCE MANUAL. SHOULD PURCHASER BELIEVE A DEFECT HAS BEEN DISCOVERED, THE PURCHASER SHALL RETURN THE ALLEGED DEFECTIVE PART TO **Hi-Vac**® CORPORATION FOR EXAMINATION, F.O.B THE **Hi-Vac**® PLANT, **MARIETTA, OHIO**. IN THE EVENT PURCHASER DOES NOT SERVICE AND MAINTAIN THE **Hi-Vac**® UNIT ACCORDING TO THE **Hi-Vac**® MAINTENANCE MANUAL, THE WARRANTY IS TO BE CONSIDERED NULL AND VOID AND **Hi-Vac**® CORPORATION'S OBLIGATION HEREUNDER SHALL BE DEEMED FULFILLED.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE AND OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF Hi-Vac® CORPORATION.

LIMITS OF LIABILITY

Hi-Vac® CORPORATION SHALL NOT BE LIABLE FOR AND PURCHASER ASSUMES RESPONSIBILITY FOR ALL PERSONAL INJURY AND PROPERTY DAMAGE RESULTING FROM THE HANDLING, POSSESSION OR USE OF YOUR **Hi-Vac**® INDUSTRIAL VACUUM CLEANER BY THE PURCHASER. THE LIABILITY OF **Hi-Vac**® CORPORATION ARISING OUT OF THE SUPPLYING OF YOUR **Hi-Vac**® **INDUSTRIAL VACUUM CLEANER**, OR ITS USE WHETHER ON WARRANTIES OR CLAIM OF NEGLIGENCE OR OTHERWISE, SHALL NOT IN ANY CASE EXCEED THE COST OF CORRECTING DEFECTS IN YOUR **Hi-Vac**® **INDUSTRIAL VACUUM CLEANER** AS HEREIN PROVIDED. **Hi-Vac**® CORPORATION SHALL NOT IN ANY EVENT BE LIABLE FOR ANY LABOR EXPENDED BY THE PURCHASER ON ANY PART OR PARTS OR FOR ANY SPECIAL DIRECT OR INDIRECT OR CONSEQUENTIAL DAMAGES. NO MATERIAL MAY BE RETURNED WITHOUT FIRST GETTING APPROVAL FROM **Hi-Vac**® CORPORATION. ANY GOODS RETURNED WITH SUCH APPROVAL MUST BE SENT BACK WITH ALL TRANSPORTATION CHARGES PREPAID WITHIN 30 DAYS AFTER ISSUANCE OF APPROVAL. GOODS RETURNED AND ACCEPTED IN ACCORDANCE WITH THE ABOVE CONDITIONS WILL BE CREDITED ON THE BASIS OF THE PRICES PAID AT TIME OF SHIPMENT.



MESSAGE TO NEW OWNER

Congratulations on your purchase of a new **Hi-Vac® INDUSTRIAL VACUUM SYSTEM**.

Hi-Vac® Corporation is a leader in conveying and material pickup. The use of a **Hi-Vac®** system will not only save you money in the short term, it will also put you on the cutting edge of today's technology in vacuum systems. With **Hi-Vac's** vast array of configurations, it is possible to meet every consumer's needs in material pickup for both wet and dry applications.

To get the most out of your new **Hi-Vac® INDUSTRIAL VACUUM SYSTEM**, please read and review the contents of this manual and become familiar with the procedures within.

Thank you for your purchase and we look forward to serving you again in the future.

SAFETY PRECAUTIONS

SAFETY PRECAUTIONS



CAUTION!

SOME DO'S AND DON'TS BEFORE GETTING STARTED WITH YOUR NEW Hi-Vac® SYSTEM.

The safety of the operator is of great importance to us at **Hi-Vac®** Corporation. The decals, shields, guards and other protective features that are designed into the machine are there for your protection. A high percentage of the accidents that occur are due to careless behavior or misuse of machinery. We ask you to be a careful operator and to properly service your machine.

AIRLIFT SAFETY NOTE: Airlifts are standard on all units with an end dump hopper.

Before startup, remove the three (3) powerhead shipping spacers and discard. This is done by unscrewing the pipe caps, slipping off the spacers, and reinstalling the three (3) caps on the pipe.

CAUTION! BE SURE TO REINSTALL THE CAPS BACK ONTO THE PIPE. FAILURE TO DO SO MAY CAUSE SERIOUS INJURY TO PERSONNEL AND/OR DAMAGE TO MACHINE.

Before attempting to operate the machine, read carefully and understand all instructions contained in the manual.

- * **Do not** put your hand in front of the intake nozzle while in operation.
- * **Do not** put your face or any portion of head in front of the nozzle.
- * **Do not** open control panel or remove any junction box cover while main power supply is live.
- * **Do not** vacuum any flammable liquid.
- * For mobile configurations, check that unit is properly stopped so unit will not tip or roll.
- * **Do not** lubricate, adjust or repair the **Hi-Vac®** unit unless power source to the electric motor has been disengaged, and locked out.
- * Keep all safety devices in place, while operating your **Hi-Vac®** unit.
- * Read all warning and instruction decals placed on the machine and its associated equipment.
- * Allow only responsible, properly instructed individuals to operate the machine.
- * Always keep the **Hi-Vac®** unit in good operating condition.
- * Clear the work area of objects that might interfere with proper operation of the **Hi-Vac®** unit.
- * Be careful to avoid overhead electrical installations. Extreme caution should be exercised whenever working near or around electrical installations.
- * **Do not** operate the **Hi-Vac®** unit while wearing loose clothing, watches or rings.
- * Periodically check for any loose bolts or set screws.

NOTE: AS WITH ANY TYPE OF HEAVY DUTY EQUIPMENT, CAUTION MUST BE EXERCISED IN ITS PROPER USE.

CAUTION! KEEP HANDS CLEAR AND AWAY FROM BETWEEN POWERHEAD AND HOPPER WHEN POWERHEAD IS RAISED AND WHEN LOWERING POWERHEAD

WARNING! FAILURE TO COMPLY WITH ANY OF THE ABOVE SAFETY INSTRUCTIONS OR THOSE THAT FOLLOW WITHIN THIS MANUAL MAY RESULT IN SEVERE INJURY OR DEATH!

PLEASE REMEMBER: Safe operation begins with a safe operator. We ask you to be that type of operator.

MACHINE SPECIFICATIONS

BASIC DESCRIPTION OF A 200 SERIES Hi-Vac® UNIT.

The **MODEL NUMBER** is broken down into three descriptive parts.

1. The first part is the **SHELL SERIES**. This describes the series of the **Hi-Vac®** unit. Both the LC and HC have twelve (12) filter bags.
2. The second part is the HORSEPOWER given to the POWERHEAD. There are six different ranges of motors on a 200 SERIES **Hi-Vac®**. **20HP, 25HP, 30HP, 40HP, 50HP, AND 75HP.**
3. The third part is the **clearance** factor of the SHELL. The 700 SERIES **Hi-Vac®** has two different clearances depending on the application for which it is use. That being **(HC) High Clearance or (LC) Low Clearance**. The **(LC)** designation is always tagged onto the end of the model number. The **(HC)** designation is almost always assumed and usually left off.

THEORY OF OPERATIONS A SIMPLE NARRATIVE OF HOW A Hi-Vac® WORKS

The following pages will describe, in as much detail as practical, the **Hi-Vac**® vacuum system. The system consists of four major components. The **Hi-Vac**® Powerhead, which is the actual vacuum producing part of the system, is mounted on a hopper. The Powerhead and hopper are mounted in a support stand. Connected to the Powerhead/hopper/support stand assembly is a pipe (hose), used to direct vacuum (air flow to material to be conveyed).

The intent of the system is to pick up spills and dust accumulations through various parts of the **Hi-Vac**® and return the materials to the to the plant. By carefully reading and following the instructions contained herein, the equipment will operate reliably and the plant environment will be improved, thereby making it a safer and cleaner place to work.

The **Hi-Vac**®, in it's simplest form, is a large vacuum cleaner. A positive displacement pump is used to evacuate the air from the storage bin below the **Hi-Vac**® Powerhead. Because there is a vacuum in the hopper, air enters it through the pick-up hose and piping connected to the unit. It is this air movement that conveys the material from the pick-up point to the **Hi-Vac**®.

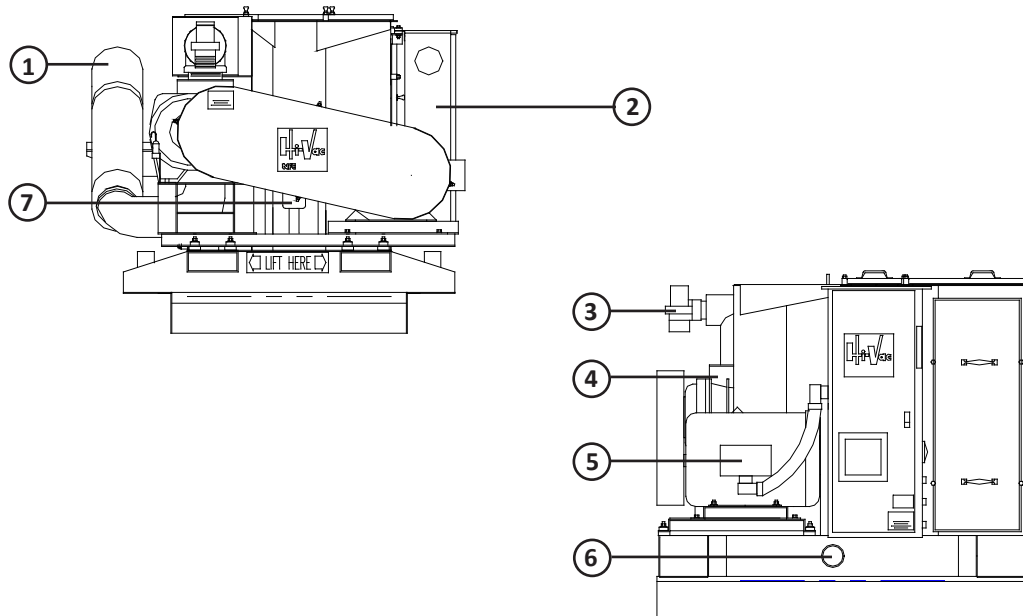
The heart of the system is a positive displacement lobe vacuum pump (blower). It is driven by a coupler or a set of v-belts and sheaves connected to a drive element, which could be an electric motor or a fuel fed engine. The blower contains impeller lobes spinning in opposite directions and always in contact of each other and the blower housing. While spinning, the lobes are capturing small volumes of air and pushing them out of the blower discharge and through an exhaust silencer back into the atmosphere.

In order to prevent the material (and the dust generated by this conveying procedure) from being discharged into the atmosphere as well, a set of filter cartridges or bags are installed. Before the air and material go into the blower they must first pass through these filters which remove nearly 100% of the dust from the air. As well as protecting the atmosphere from dust, this also stops any dust from entering the blower and causing serious damage.

There is one stage of separation of the material and dust from the air before they get to the filters. As the material enters the **Hi-Vac**® from the pickup hose and piping system it goes through a centrifugal separator which spins the material out of the air stream and into the collection bin below the Powerhead. Any material left in the air is then carried to the filters.

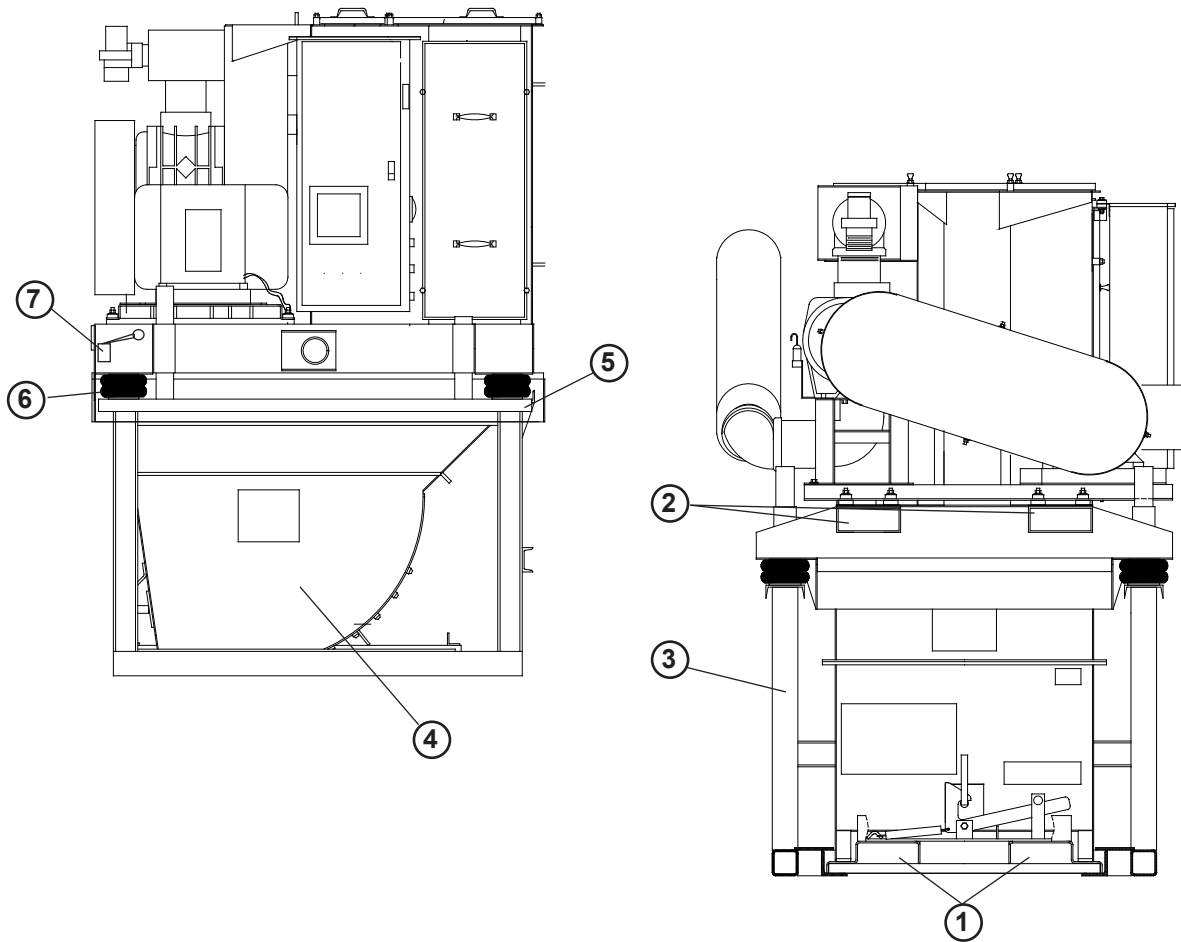
As the air passes through the filters, the dust is trapped on the outside of the filters. Every 10 to 15 seconds, compressed air is blasted into the inside of the filters. This pulse of air keeps the outside of the filters clean.

There are several different types of material bins, all of which will eventually fill with material. When this occurs, the unit will shut down and cannot be restarted until this condition is corrected. In some cases, as with end dump and rear dump hoppers, the Powerhead will be lifted off of the hopper with an airlift. The hopper will then be taken by a fork lift to a location to be emptied then replaced below the Powerhead. In this case the Powerhead must be restarted manually. In other cases, as with bottom dump hoppers, it may have a self dumping discharge gate. In this situation, the unit will shut down momentarily, discharge the material, the gate will close, and the unit will restart automatically (there is a switch in the panel to override this auto-restart). This self dumping gate may be replaced with any one of several optional discharges. Any thing from rotary feeders and pinch valves (for continuous discharge) to knife gates and fluid powered swing gates (for regulated and/or remote applications).



POWERHEAD

ITEM	PART #	DESCRIPTION	QTY
1	09-0002-MFD	SILENCER,5",STANDARD HI-VAC	1
2	13-9030	PANEL,30HP,200/400,460/3/60,N4/N12,STD	1
3	16-0034	VALVE,RELIEF,3",(18" HG)	1
4	03-0023-R	BLOWER,ROOTS 409-RAMJH,RH-CW (BD),5"NPT	1
5	04-0004	MOTOR,30HP,230/460/3/60,286T,TEFC	1
6	01-2224-MFD	INLET PIPE,200 SERIES	1
7	27-0181	DREXELBROOK POINT-LINE LEVEL PROBE SYSTEM	1

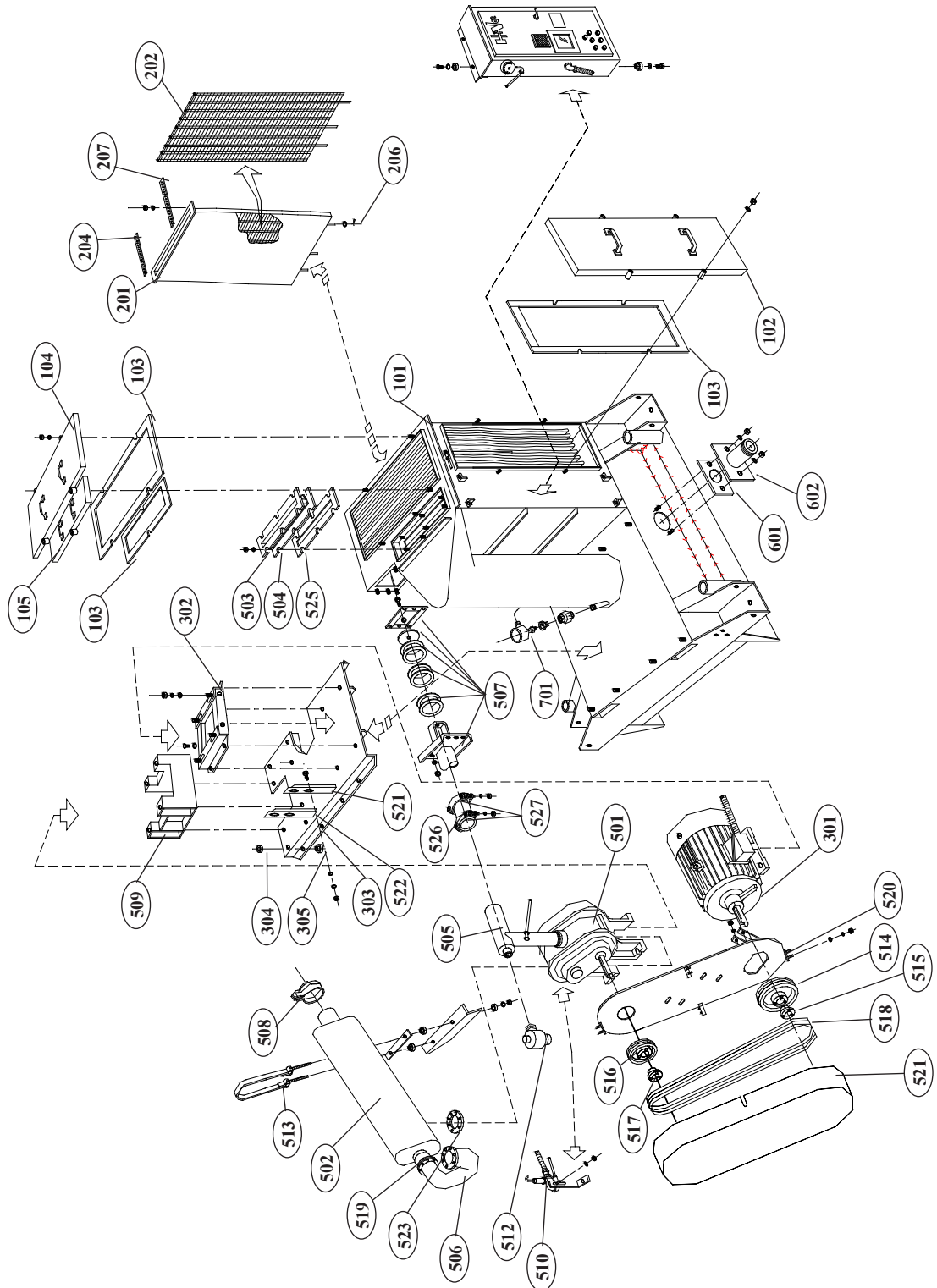


HOPPER, STAND, and AIRLIFT

ITEM	PART #	DESCRIPTION	QTY
1	N/A	HOPPER FORK TRUCK LIFTING AREA	1
2	N/A	POWERHEAD FORK TRUCK LIFTING AREA	1
3	31-2003-MFD	OBS,STAND,A/L,1.5CU.YD,200/400/800 SER**	1
4	01-0101-MFD	HOPPER,END,1.5YD	1
5	15-0052-MFD	AIR LIFT ASSY,2XX SERIES	1
6	15-0066	BAG,AIR LIFT,DOUBLE CONVOLUTE	4
7	15-0001	VALVE,4-WAY,1/4NPT,MANUAL,AIR LIFT	1

MACHINE COMPONENTS

(page 1 of 3)



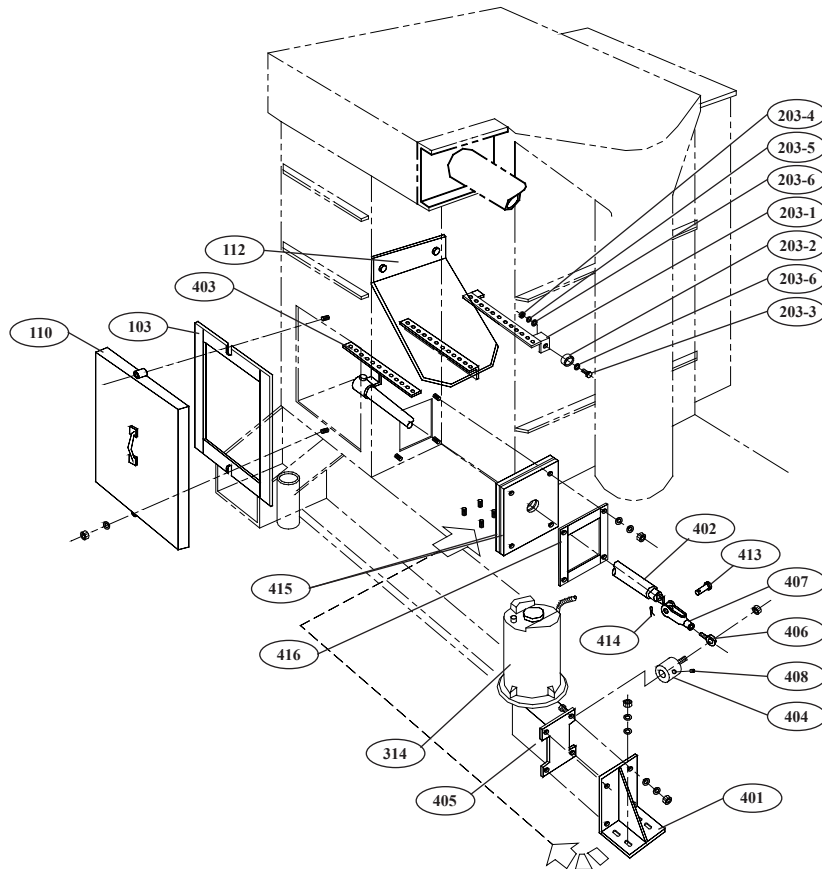
MACHINE COMPONENTS (page 2 of 3)

ITEM	PART #	DESCRIPTION	QTY
101	01-2203-MFD	SHELL WELDMENT,200 SERIES HIGH CLEARANCE	1
102	01-2209-MFD	DOOR,SIDE BAGHOUSE,200 SERIES	1
103	18-0188	GASKET,RUBBER UTILITY,1/4" X 3/4" X 50'	1
104	01-2208-MFD	DOOR,TOP BAGHOUSE,200 SERIES	1
105	01-2212-MFD	DOOR,LINEAR SEPARATOR,200/400 SERIES	1
201	20-0096	FILTER BAG,LC,ACRYLIC COATED POLYESTER	12
202	19-0009	CAGE,FILTER BAG,LOW CLEARANCE UNITS	12
204	01-1386-MFD	BAR,RETAINER,END,HI-VAC BAGS,200 SERIES	2
206	08-0007	PIN,COTTER,1/8" X 1",PLTD,HAMMERLOCK	4
207	01-1387-MFD	BAR,RETAINER,MIDDLE,HI-VAC BAGS,200 SERIES	7
301	04-0004	MOTOR,30HP,230/460/3/60,286T,TEFC	1
302	04-0066	MOTOR MTG. BASE,ADJUSTABLE,286T FRAME	1
303	01-2927-MFD	ISOLATOR BASE,200/400 SERIES	1
304	18-0260	ISOLATOR,SMALL	8
305	18-0209	ISOLATOR,MEDIUM	8
501	03-0023-R	BLOWER,ROOTS,409-RAMJH,HORIZ,RHCW,5"NPT	1
502	09-0002-MFD	SILENCER,5",STANDARD HI-VAC	1
503	11-0183-MFD	NOZZLE,LINEAR SEPARATOR,30HP	1
504	11-0187-MFD	ORIFICE PLATE,30HP	1
505	02-1930-MFD	INLET PIPING,8H,200 SERIES	1
506	02-0106-MFD	DISCHARGE PIPING,7H/8H,200 SERIES	1
508	09-0007	RAINCAP,5.25",ALUM,#18	1
509	01-1325-MFD	BLOWER MOUNT,8H,200 SERIES	1

MACHINE COMPONENTS (page 3 of 3)

ITEM	PART #	DESCRIPTION	QTY
510	27-0022	LUBE LEVEL SWITCH ASSY,6-7-8HF BLOWER	2
512	16-0034	VALVE,RELIEF,3",(18"HG)	1
513	09-0054-MFD	MUFFLER ISOLATION BRACKET,200HC/400HC	1
514	06-0187	SHEAVE,3V10.6 X 3-SK	1
515	06-0127	BUSHING,SK X 1.875	1
516	06-0188	SHEAVE,3V14.0 X 3-SK	1
517	06-0172	BUSHING,SK X 1.75	1
518	07-0003	BELT,5VX950	3
519	02-0344-MFD	FLANGE,MUFFLER,5",8H,200 SERIES	1
521	01-1455-MFD	MOUNT,BELTGUARD,MOTOR SIDE,200/400 SERIES	1
522	01-1456-MFD	MOUNT,BELTGUARD,BLOWER SIDE,200/400 SERIES	1
523	18-0264	GASKET,FLANGE	2
525	18-0003	GASKET,1/4" X 2" X 50' ROLL	.0700
526	18-0423	SLEEVE,FLEXIBLE,6"ID X 4-PLY X 6" LONG	2
527	10-0575	CLAMP,T-BOLT,6-1/4" - 6-9/16",HEADR SLVE	2
601	18-0042	GASKET,INLET	1
602	01-2224-MFD	INLET PIPE,200 SERIES	1
701	27-0181	DREXELBROOK POINT-LINE LEVEL PROBE SYSTM	1
702-1	16-0011	GAUGE,VACUUM,0-30",5 1/4 DIA FACE	1
702-2	02-0256	ELBOW,PIPE,90D,1/4"FNPT,150#,MI	1
702-3	02-0048	ADAPTER,STR,1/4"MNPT X 1/4" HOSE BARB	2
702-4	10-0041	HOSE,FUEL LINE,PUSH-LOC,1/4"	8
704	12-0046	INSTALLATION,MAGNEHELIC(PRESS.DIFF)GAUGE	1

SHAKER ASSEMBLY (page 1 of 2)

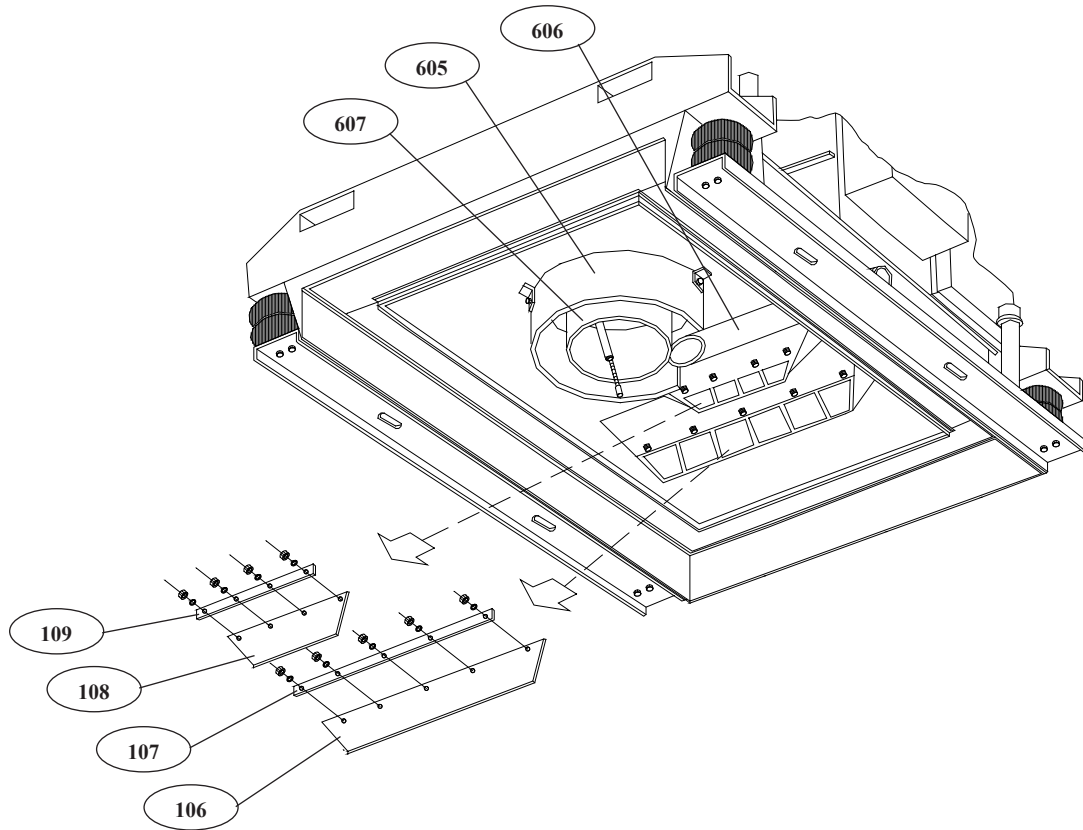


ITEM	PART #	DESCRIPTION	QTY
103	18-0188	GASKET,RUBBER UTILITY,1/4" X 3/4" X 50'	1
110	01-2211-MFD	DOOR,SHAKER COVER,200 SERIES	1
112	01-2525-MFD	RAINSHIELD,SHAKER MOTOR,200/300/400	1
203-1	01-1923-MFD	BAR,TIE,200 SERIES	1
203-2	18-0292	BUMPER,RECESS	1
203-3	A107216	SCREW,CAP,5/16-18 X 1",HH,PLT,GR8	1
203-4	A107062	NUT,HEX,5/16"-18,GR8,PLATED	1
203-5	21-0905	LOCK WASHER,RCS BUMPER*NO LONGER USED	2
203-6	A107214	WASHER,FLAT,5/16" SAE,PLATED,GR8	1
314	04-0102	MOTOR,.75HP,230/460/3/60,56C,TEFC	1

SHAKER ASSEMBLY (page 2 of 2)

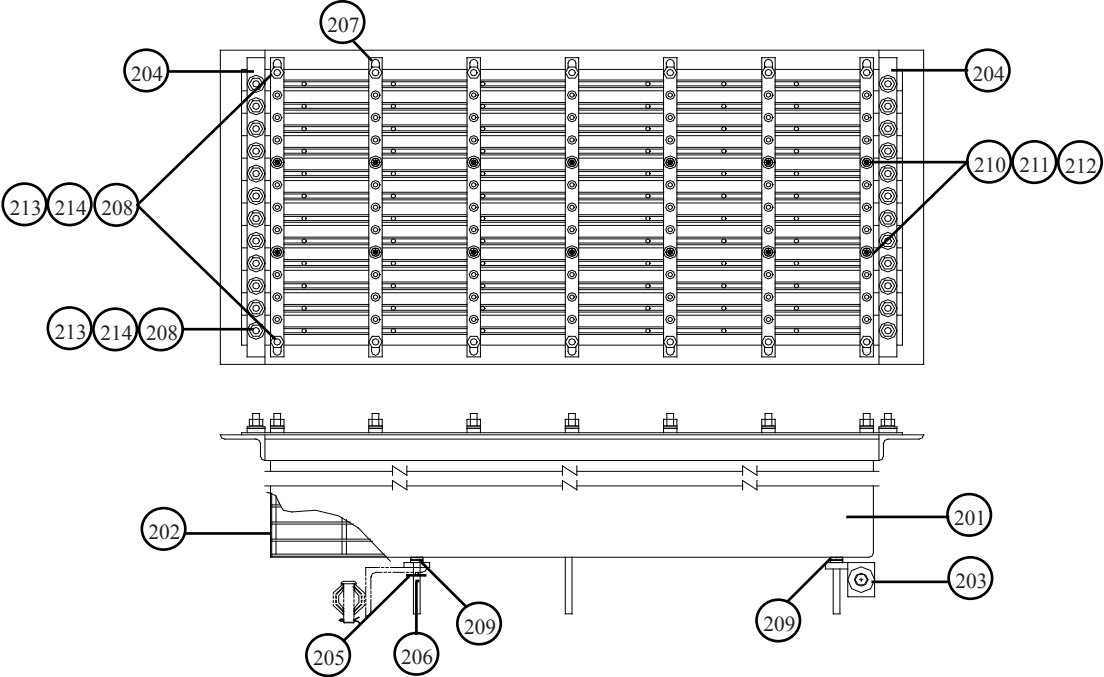
ITEM	PART #	DESCRIPTION	QTY
401	01-1168-MFD	MOUNT,SHAKER GEAR,200/300/400 SERIES	1
402	01-2514-MFD	SHAKER SHAFT,200 SERIES	1
403	01-2515-MFD	DRIVE BAR,SHAKER,200 SERIES	1
404	24-0059	BAG SHAKER,ECCENTRIC	1
405	25-0013	GEAR REDUCER,SHAKER	1
406	17-0010	BEARING,3/8" ROD END	1
407	08-0009	YOKE END,3/8"-24,W/CLEVIS PIN & COTTER	1
408	21-2405	SCREW,SET,5/16"-18 X 3/4",SOCKET	2
413	08-0068	PIN,CLEVIS,1/2" DIA. X 2" LONG	1
414	08-0136	PIN,COTTER,1/8" X 2"	1
415	18-0056	GASKET,RUBBER DIAPHRAGM	1

SEAL ASSEMBLY



ITEM	PART #	DESCRIPTION	QTY
106	18-0041	SEAL,FLAP,BAGHOUSE	1
107	01-0873-MFD	BAR,RETAINER,BAGHOUSE FLAPSEAL	1
108	18-0040	SEAL,FLAP,LINEAR SEPARATOR	1
109	01-0869-MFD	BAR,RETAINER,LINEAR SEPERATOR FLAPSEAL	1
605	01-2223-MFD	CENTRIFUGAL RING,200 SERIES,STD	1
606	01-2224-MFD	INLET PIPE,200 SERIES	1
607	01-2225-MFD	STACK EXTENSION,200 SERIES	1

FILTER BAG ASSEMBLY



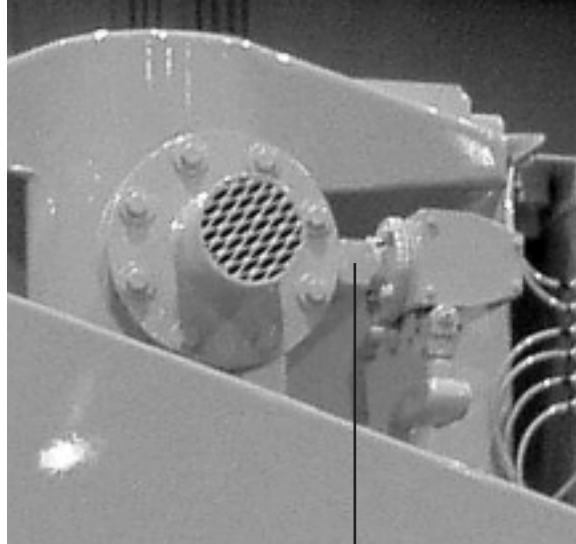
ITEM	PART #	DESCRIPTION	QTY
201	20-0096	FILTER BAG,LC,ACRYLIC COATED POLYESTER	12
202	19-0009	CAGE,FILTER BAG,LOW CLEARANCE UNITS	12
203	20-0076-MFD	KNOCKER BAR ASSY,200HC,12 BAG	1
204	01-1386-MFD	BAR,RETAINER,END,HI-VAC BAGS,200 SERIES	2
205	21-1106	WASHER,FLAT,3/8" NOM,GR5,PLATED	4
206	08-0007	PIN,COTTER,1/8" X 1",PLTD,HAMMERLOCK	4
207	01-1387-MFD	BAR,RETAINER,MIDDLE,HI-VAC BAGS,200 SERIES	7
208	21-1406	BOLT,3/8"-16 HEX x 2-1/2"LG, GR 5, PLATE	38
209	18-0126	GROMMET,5/16" I.D.	36
210	21-1404	BOLT,1/4"-20 HEX	14
211	A107214	WASHER,FLAT,5/16" SAE,PLATED,GR8	14
212	21-0904	WASHER,LOCK,1/4" NOM,GR8,PLATED	14
213	21-1106	WASHER,FLAT,3/8" NOM,GR5,PLATED	38
214	A107294	WASHER,LOCK,3/8",PLT,GR8	38

RECOMMENDED SPARE PARTS LIST

ITEM	PART #	DESCRIPTION	QTY
1	20-0096	FILTER BAG,LC,ACRYLIC COATED POLYESTER	12
2	19-0009	CAGE,FILTER BAG,LOW CLEARANCE UNITS	12
3	18-0040	SEAL,FLAP,LINEAR SEPARATOR	1
4	18-0041	SEAL,FLAP,BAGHOUSE	1
5	16-0011	GAUGE,VACUUM,0-30",5 1/4 DIA FACE	1
6	16-0012	GAUGE,DIFF PRESSURE,0-20",4 3/4 DIA FACE	1
7	13-0001	SWITCH,PRESS. DIFF,SPDT,3-22"WC	1
8	13-0979	SWITCH,LOW AIR PRESSURE, ELECTRIC	1
9	13-0098	SWITCH,VACUUM ELECTRIC, 0-18"HG	1
10	20-0069	FILTER TUBE,PRESSURE DIFFERENTIAL	4
11	18-0188	GASKET,RUBBER UTILITY,1/4" X 3/4" X 50'	1
12	20-0073	FILTER ELEMENT,FOR BROKEN BAG DETECTOR	3
13	17-0010	BEARING,3/8" ROD END	1
14	24-0059	BAG SHAKER,ECCENTRIC	1
15	08-0009	YOKE END,3/8"-24,W/CLEVIS PIN & COTTER	1

OPTIONS

VACUUM BREAKER OPTION



①

LOW BLOWER OIL OPTION



②

ITEM	PART #	DESCRIPTION	QTY
1	16-0331	VALVE,BUTTERFLY,4",LUG,250PSI,120VAC,N4	1
2	27-0012	SWITCH,OIL LEVEL,SPST N/O	1

INSTALLATION

SET-UP PROCEDURES



After you have done all the inspection procedures as recommended in the beginning of this manual, you are now ready to install your **Hi-Vac®** unit. Please follow the procedures listed in this section. If you have any questions, please feel free to call **Hi-Vac®** at 1.800.752.2400 or in OHIO call 1.740.374.2306.

Your **Hi-Vac®** unit is broken down into 4 sections. Hopper, Stand, Airlift, and Powerhead. Once together, you can move the unit throughout the plant using the fork openings. Be sure that the Airlift is bolted to the stand before operation begins.

Note: When moving the Powerhead and/or Hopper, always lift from the fork openings.

Note: Refer to your electrical schematic for proper voltage specification.

Note: Use National or Local electrical codes to install incoming power to your Hi-Vac® unit.

1. Connect customer supplied power cord as shown in item **A**. This must be done by a certified electrician.
2. Connect Airline to unit as shown in item **B**. The minimum required air pressure is **1 CFM at 90 PSI**.

Caution: Maximum air pressure should not exceed 120psi.

3. Remove the three (3) spacers on powerhead guides. Be sure to replace caps on guides and tighten down firmly. See item **C**.
4. You are now ready for the Pre-start procedures for your new **Hi-Vac®** unit.

OPERATIONS

PRESTART PROCEDURES

Caution! As with any type of heavy duty equipment, caution must be exercised in its proper use. A thorough understanding of the use and functions of this equipment should be attained before an attempt is made to use it.

1. Connect or disconnect vacuum conveying hoses and fittings to the machine inlet pipe or manifold system only when the powerhead is off.

Caution! FAILURE TO DO SO COULD RESULT IN INJURY TO OPERATING PERSONNEL.

2. Before starting the machine, check all fluid levels. This includes the vacuum pump oil levels (Rear on all units and shaft end if so equipped). Level should be midway on site glass.



TYPES OF OIL SITE GLASSES

3. Before starting the machine, check all wiring for abrasions, cuts, cracks, etc. If any, repair or replace.

Caution! BE SURE TO DISCONNECT ALL POWER WHEN REPAIRING ELECTRICAL LINES. FAILURE TO DO SO COULD RESULT IN INJURY.

4. Before starting the machine, check all conduit runs and fittings for defects.

PRESTART PROCEDURES

5. Check electric blower motor for proper rotation as follows:

- A. While observing the silencer exhaust flap, “bump” electric motor by pushing the Blower “Start” button and immediately pushing the Blower “Stop/Reset” button.
 - I. If flap rises and air is exhausted from silencer, the rotation is correct.
 - II. If the silencer flap does not move, (air is being sucked in), the rotation is wrong.
 - a. Correct this by first insuring that incoming power is disconnected, then rewire incoming service wire at the top of the circuit breaker.

Note: This will correct both the blower motor as well as the bag shaker motor.

Caution! DO NOT REVERSE ANY WIRES BELOW THE CIRCUIT BREAKER.

6. Check bag shaker timer setting as follows:

- A. Initiate a bag shaking cycle by “bumping” the blower motor as stated for the motor rotation.
- B. Verify that the shaker motor runs for at least 30 seconds. If not, adjust timer located inside main electrical control panel.

Note: Additional shaking time is required to higher dust loads. Maximum shaking time is 60 seconds.

START-UP PROCEDURE

A. Electric Motor Drive

1. Perform pre-start procedures.
2. Confirm that vacuum conveying hoses and fittings are connected and pick up nozzle is out of material so that the vacuum pump may “breathe freely” during startup.

Note: Always connect or disconnect vacuum conveying hoses and nozzles to your **Hi-Vac®** inlet or manifold before turning on the powerhead.

FAILURE TO DO SO COULD RESULT IN INJURY TO OPERATING PERSONNEL.

3. Control panel door must be closed and locked.
4. Circuit breaker turned on.
5. Assure “E-Stop” button has been pulled out.
6. Push Blower “Stop/Reset” button.
7. Push Blower “Start” button.

Note: The blower is turning in the correct rotation if the silencer exhaust cover lifts open and air is discharging from the silencer.

8. Your **Hi-Vac®** is now operating and ready to use. Check your gauges to make sure that the unit is running correctly.
9. Slowly introduce the pickup nozzle into the material to be conveyed.

SHUTDOWN PROCEDURES

A. Manual Stopping

1. Remove vacuum hose intake nozzle from material and allow sufficient time for vacuum hose to clear itself.
2. When time permits, allow vacuum pump to continue to run with no load “free breathing” a couple of minutes so that the vacuum has sufficient time to cool down.
3. Push Blower “Stop/Reset” button.

Note: When vacuum pump stops spinning and there is zero air flow, the bags will automatically be shaken. Wait for the bag shaking system to complete its cycle before either restarting the blower, or turning off the control panel power.

4. Push in “E-Stop” button.

Note: Never stop powerhead with “E-Stop” button unless it is an emergency. Always go through the above described stopping sequence.

5. An LED on the Programmable Logic Controller (located in the control panel), will light if any of the Safety Faults shut down the unit. Please refer to the electrical schematic located within the “ELECTRICAL” section of this manual to find out why the unit has shutdown.

SHUTDOWN PROCEDURES

B. Emergency Automatic Stopping

An LED on the Programmable Logic Controller (located in the control panel), will light if any of the Safety Faults shut down the unit. Please refer to the following LED's to find out why the unit has shut down.

1. INPUTS

The control panel is now ready, for any control signals that it receives. Input "I/1" and "I/2" are prewired from the two timers that are located just beside the controller. These two timers adjust the bag shake time and the automatic restart time if a self dumping hopper is used.

a. The following inputs are "Blower Shutdown" signals:

I / 4 Broken Filter

Material has passed through the filters and the broken bag detector has sensed it. Check filters immediately. Replace any filters that are torn. Make sure that all filters are being held tightly in place and that the dust cannot be allowed to pass around the filters.

I / 7 Blower Stop/Reset button

This button stops the blower. It is also used to reset a fault.

I / 8 End Dump Hopper Full

The end dump hopper is full. Empty hopper.

I / 9 Low Blower Oil

The level of the oil in the blower is too low. Check the level of the oil in the blower. Fill with oil per the instructions in the blower manual.

I / 10 High Blower Temperature

The temperature of the air leaving the blower is above 350 deg. F. Press the blower "Stop/Reset" button. Allow the unit to cool. Check for plugged lines. Allow the unit to pull in only air until the temperature has been reduced.

I / 12 Dirty Filter Bags

The filter differential is measured in inches of water column. When the differential reaches 20" of water, the unit will shut down. The unit will then shake the bags.

b. The following inputs are:

I / 5 Start Button

This button starts the blower.

I / 11 No Air Flow Shaker Start

Allowing shaker to start.

I / 13 Self Dump Hopper Auto Restart

Permissive for bottom dump hopper.

SHUTDOWN PROCEDURES

2. OUTPUTS

- O / 1 Broken Filter**
Amber pilot light on door.
- O / 3 Blower Running**
Energizes M1, Blower and green pilot light on door.
- O / 4 End Dump Hopper Full**
Red pilot light on door.
- O / 7 Shaker Running**
Energizes M2, Shaker motor
- O / 8 Dirty Bags Too Frequent**
Indicates that the blower has automatically shutdown four (4) times within 10 minutes because of dirty bags. Shut the power off and check for mechanical problems.
- O / 9 Bottom Dump Restart Timer**

3. There are two other LED's on the PLC which are for information purposes only.

- O / 5 Low Blower Oil**
No light on the front of the panel.
- O / 6 High Blower Temperature**
No light on the front of the panel.

4. Thermal Protector

On large primary electric motor units there is a thermal protector. This will reset automatically as electric motor cools.

AUTOMATIC PROTECTION SYSTEMS

LISTED HERE ARE EVENTS THAT CAN CAUSE SERIOUS DAMAGE TO THE Hi-Vac® UNIT. THE Hi-Vac® IS DESIGNED TO PROTECT THE UNIT FROM EACH OF THESE LISTED POTENTIAL HAZARDS BY THE FOLLOWING MEANS:

1. VACUUM PUMP PROTECTION SYSTEMS

A. LOW OIL LEVEL IN THE GEAR CASE(S) OF THE VACUUM PUMP.

1. In the event a loss of oil occurs during operation, low oil level float switch(s), installed near the vacuum pump, will shut off the **Hi-Vac®** automatically. To restart the system, press the “Blower Stop/Reset” button and then press the “ Blower Start” button.
2. The level switch(s) must be in a vertical position with the glass (plastic) end up and copper breather tube above the glass.
3. Daily checks of the oil level, by visually inspecting the oil level sight glass(s) on the vacuum pump, will prevent a low oil condition. Do not use level switches to check oil level.

B. EXCESSIVELY HIGH VACUUM.

1. Maximum allowable vacuum is 18 inches of mercury (hg) at sea level.
 - a. When the vacuum reaches this level a spring loaded mechanical vacuum relief valve located on the inlet pipe of the vacuum pump opens and allows air to enter the vacuum pump directly, thus relieving the high vacuum condition.
 - b. When the vacuum has gone down sufficiently, the valve automatically closes.

C. HIGH TEMPERATURE OF DISCHARGED AIR.

1. High vacuum will cause the temperature of the air being discharged from the vacuum pump to increase.
 - a. This is because the air moving through the blower is used to cool it as well as convey material into the **Hi-Vac®**.
2. Heat buildup in the vacuum will cause the lobes to expand and eventually cause them to rub the vacuum pump case.
3. The heat rise could attain temperatures which would damage the gear case oil and seals.
4. To prevent this, the **Hi-Vac®** has been provided with a high temperature sensing thermal switch and gauge located on the side of the control panel.
 - a. The thermal switch sensor is located in the discharge pipe of the vacuum pump.
 1. When the discharge air temperature reaches 350° F, the **Hi-Vac®** will shut down automatically. To restart the system, press the “Blower Stop/Reset” button and then press the “ Blower Start” button.

AUTOMATIC PROTECTION SYSTEMS

2. CLOTH DUST COLLECTOR PROTECTION SYSTEMS

A. DIFFERENTIAL PRESSURE SWITCH AND GAUGE. DURING OPERATION, THE CLOTH MATERIAL OF THE FILTER BAGS COLLECTS THE DUST GENERATED DURING THE OPERATION OF THE Hi-Vac®.

1. As the dust buildup increases on the dirty air side of the bags, so does resistance to air flow through the bags.
2. This resistance will cause a higher static vacuum on the clean side (the inner side) and a lower static vacuum on the dirty side of the bag.
 - a. This difference is the “differential pressure”.
3. To prevent overloading the filter bags with dust the Hi-Vac® is equipped with a differential pressure switch and gauge to measure and limit the pressure drop across the bags.
 - a. Both the switch and gauge are located on the control panel.
 - b. Any dust buildup on the bags which causes 20 inches of water differential pressure is excessive.
 1. The pressure differential switch is set so that at 20 inches of water, the Hi-Vac® will shut itself off, shake the filter bags, and automatically restart.

B. ZERO AIR FLOW SWITCH FOR DUST COLLECTOR. PRIOR TO THE START OF THE BAG SHAKING OPERATION, THERE MUST NOT BE ANY AIR FLOW THROUGH THE BAGS.

1. To prevent the shaking of the bags before there is a no air flow condition, the Hi-Vac® is equipped with another pressure differential switch.
 - a. When the Hi-Vac® is running, this switch senses the pressure difference between the clean air side of the filter bags and atmospheric pressure.
 1. In effect, it is sensing the air flow across the bags because if there is no pressure difference, there is no air movement.
 - b. This switch is set at “0” inches of water pressure difference and is electrically interlocked with the bag shaker system to prevent shaking until there is no air movement across the filter bags.

AUTOMATIC PROTECTION SYSTEMS

C. BROKEN FILTER (IF ONE OR MORE OF THE CLOTH FILTER BAGS START TO LEAK DUST TO THE VACUUM PUMP).

1. A set of dust passage filters are installed between the clean side of the filter bags and the vacuum pump inlet to collect the dust passing through the leaking bags.
2. When a sufficient amount of dust is collected on the dust passage filters it will cause an increased resistance to air flow.
3. This resistance to air flow is detected by a pressure differential switch.
 - a. At 20 inches of water pressure difference across the dust passage filters the **Hi-Vac®** will automatically shut off.
4. When this condition occurs:
 - a. All filters should be checked for leaks and replaced if necessary.
 - b. The dust detection filters must be cleaned and re-oiled. Refer to the “servicing instruction for **Hi-Vac®** type “c” cylindrical impingement filters” located in the maintenance section.
5. To restart the system:
 - a. Pull out on the “Emergency Stop” button to turn unit control power on.
 - b. Press the “Blower Stop/Reset” button.
 - c. Press the “Blower Start” button.

Note: If the blower has automatically shutdown four (4) times within 10 minutes because of dirty bags, the unit will initiate a “Lock Out Mode” and the blower will be prevented from starting. Turn the Main Power Disconnect to the “Off” position and check for mechanical problems.

To restart the system:

- a. Turn the Main Power Disconnect to the “On” position.
- b. Proceed through the “Start-Up Procedures” located on page 3 in the “Operations” section of this manual.

MATERIAL CONVEYING TIPS

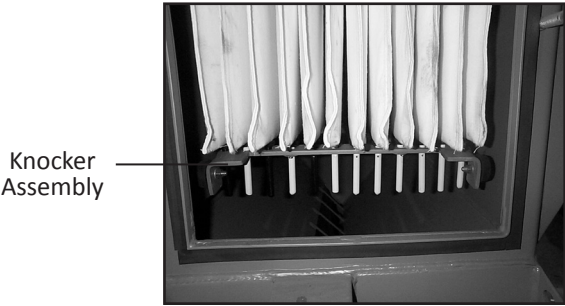
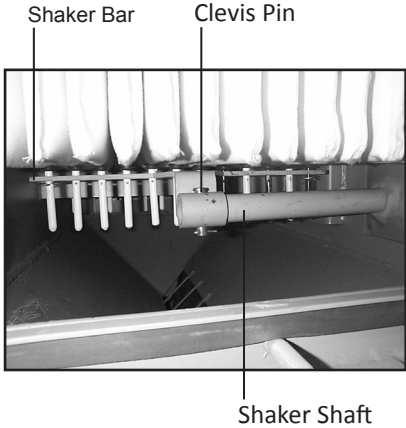
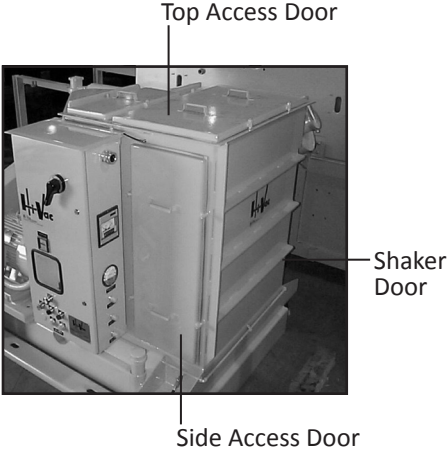
1. The **Hi-Vac®** should always be operated with one of the nozzles furnished. For heavy bulk material pick up, air must always be bled in with material for conveying through hose. Hose “dead head”, pick up of material piles without our nozzle, should be avoided because hose overloading will occur causing the conveying hose and/or pipe to become plugged.
2. For maximum bulk pick up rate bury the end of the bulk nozzle into the material pile. Material an conveying air will automatically be drawn into the nozzle. For peak capacity the **Hi-Vac®** vacuum pump should operate between 13" Hg. and 15" Hg. as shown on the vacuum gauge located on the control panel. Any extra vacuum capability should be reserved to take care of sudden material surges into the nozzle. The vacuum is adjustable by means of the air bleed-in sleeve on the nozzle. Keep in mind the following:
 - A. **Lots of air + little material = low vacuum**
 - B. **Little air + lots of material = high vacuum**
 - C. **No air + no material conveyed = plugged conveying line**
3. Additional nozzle movement in material will be necessary for maximum capacity on materials that are not free-flowing.
4. Eliminate as many air leaks as possible in conveying hoses. For instance, replace hoses that are worn through, tighten compression type hose couplings for minimum air leakage.
5. Keep conveying hoses as straight as possible. Eliminate sudden kinks or sharp bends whenever possible. The best way to avoid unnecessary bends in the hose is to carry the nozzle end past the work area until the hose is straight, then go back to work area.
6. Do not convey hot and moist material. Steaming may cause moisture to condense on the filter cartridges causing a non-releasing “cake” on the filter cartridges. This cake must then be manually removed from the filter cartridges.
7. Use the correct nozzle for the work
 - A. **Bulk nozzle:** To be used when vacuuming measurable depths of liquids and large piles of material.
 - B. **Round lance nozzle:** For general clean-up and reaching in corners.
 - C. **Flat lance nozzle:** For vacuuming between and under equipment and into tight places.
 - D. **Flared nozzle:** For cleaning large areas where materials do not exceed 6" depth. Serrated edge for caked materials.
 - E. **Hand brushes:** For removal of accumulated dust on flat and/or irregular surfaces.

MAINTENANCE

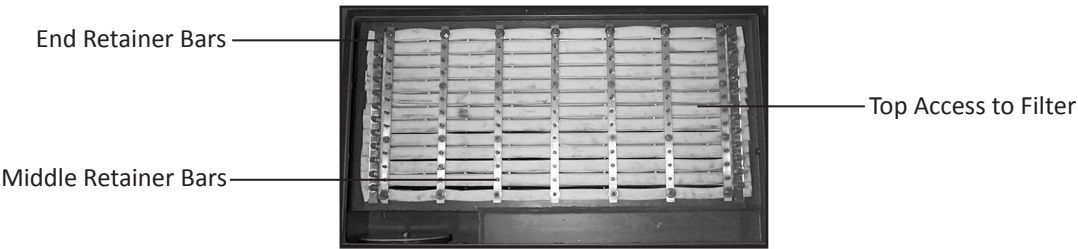
BAG CHANGE PROCEDURES

1. Bag Removal

- A. Remove side access door and shaker door.
- B. Remove top access door. (This door may be moved forward and left on top of unit.)
- C. Remove cotter pin and clevis pin holding shaker shaft and drive bar together and separate them. (Located at the bottom of the filter bags, inside dirty air plenum, inside shaker access door.)



- D. Remove the cotter pins located on the first and last bag cages under the shaker bar. Completely remove the shaker bar from the bottom of bags. This is done through the shaker access door.
- E. Remove the cotter pins located on the first and last bag cages under the rubber ended knocker bar assembly. Completely remove the rubber ended knocker bar assembly from the bottom of the bags. This is done through the large side access door.
- F. On the top of the machine, remove the end and middle bag retainer bars and hardware on top of the filter bags.



BAG CHANGE PROCEDURES

- G. Lift the first filter bag cloth flange up over the 3/8" studs and 1/4" pins.

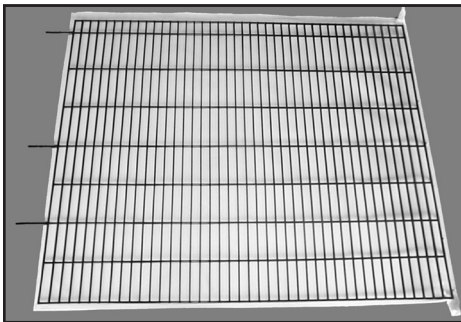
Note: The first filter bag to be removed is either the one nearest or farthest from the vacuum pump. It is the only one that has the cloth flange on top of the adjacent filter bag and over the outside row of 3/8" studs.

- H. Lift the complete bag/cage up and out of the machine. Repeat this for all of the remaining bag/cages.

- I. Remove the filter bags from the cages.

Note: Check the pins at the bottom of the cages. They should all have small holes through them. If only some have holes, mark or set aside two cages with holes drilled in the pins for installing as the first and last bag/cage to be installed below.

- J. Check each bag cage for damage, broken bars, bent rods, etc. replace any cage found damaged.



- K. Repair or replace any broken or missing 3/8" studs and 1/4" pins on the filter bag mullion frame at this time.

- L. Remove and service the dust passage filters at this time. See "DUST PASSAGE FILTER CHANGING PROCEDURE" for details.

- M. Completely and thoroughly clean the filter bag mullion frame and dust passage filter area on top of the machine. This will prevent dust from reaching the vacuum pump and causing serious damage.

BAG CHANGE PROCEDURES

2. Filter Bag Installation

- A. Make sure that all of the cages are clean (to prevent damage to the vacuum pump)
- B. Install all of the filter bags onto the cages.

Note: The pins on the bottom of the cages are offset as are the holes in the bottom of the filter bags. Match the holes in the bottom of the filter bags with the pins on the bottom of the cages.

IMPORTANT: If a filter bag is damaged do not attempt to use it. It will leak and allow material to go to the vacuum pump. Serious damage to the vacuum pump can result from dust leaking through the filter bags.

- C. Install the black rubber grommets (supplied with every set of filter bags) over all of the pins of the cages and push them firmly against the filter bag and the bottom of the cage.

Note: Installing the rubber grommets is required to prevent small amounts of dust from leaking between the filter bag and the cage. Serious damage to the vacuum pump can result from dust leaking through the filter bags.

- D. Replace the first bag/cage in the filter bag mounting frame by bringing the bag down through the first slot (nearest the vacuum pump) and inserting the center pin on the bottom of the cage through the first hole (nearest the vacuum pump) in the angle iron pivot bar inside the machine.

Note: The pins on the bottom of the cages are offset. Make sure that the bag/cage is inserted with the outside pin closest to the center on the same side as the bag shaker motor (inside the shaker access door.)

Note: Make sure that the first bag/cage installed has holes in the pins for installing the cotter pins.

IMPORTANT: If a filter bag is damaged do not attempt to use it. It will leak and allow material to go to the vacuum pump. Serious damage to the vacuum pump can result from dust leaking through the filter bags.

BAG CHANGE PROCEDURES

- E. Push the filter bag cloth flange down over the threaded 3/8" studs and 1/4" pins.

Note: Each filter bag cloth flange should have 1/8" steel wires in the filter bag cloth flange. Make sure that the 1/8" steel wires in the filter bag cloth flange are outside the threaded 3/8" studs and 1/4" pins before pushing the filter bag cloth flange over the threaded 3/8" studs and 1/4" pins. If this is not done correctly, dust will leak around the filter bags. Serious damage to the vacuum pump can result from dust leaking around the filter bags.

Note: Make sure that the filter bag cloth flange is pushed down flat against the filter bag mounting frame. If this is not done correctly, dust will leak around the filter bags. Serious damage to the vacuum pump can result from dust leaking around the filter bags.

- F. Repeat steps (D) and (E) with the remaining bag/cages.

Note: Install each bag/cage in the next adjacent slot in the filter bag mounting frame. Make sure that the filter bag cloth flange of the bag/cage being installed is on top of the filter bag cloth flange of the previously installed bag/cage.

Note: Make sure that the first and last bag/cage has holes in the pins for installing the cotter pins.

- G. Replace the bag retainer bars on the threaded 3/8" studs and 1/4" pins. Use flat washers, lock washers, and nuts to secure the bag retainer bars.

Note: Be careful not to drop any foreign objects such as nuts or washers into the bag/cage. If you do, they must be removed or they will cause damage to the vacuum pump.



BAG CHANGE PROCEDURES

H. Install the dust passage filters at this time. See “Dust Passage Filter Changing Procedures” for details.

I. Replace the large top access door.

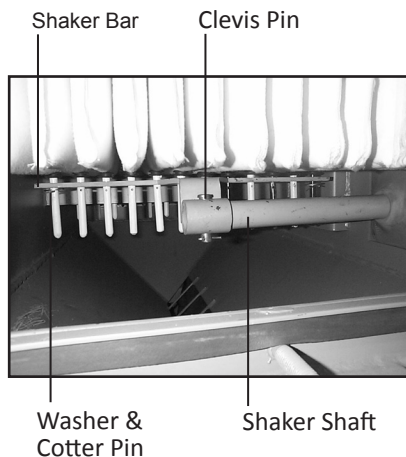
Note: Repair or replace any damaged gaskets before installing the top access door. Damaged gaskets can allow dust to leak into the clean side of the filter bags. This can cause serious damage to the vacuum pump.

J. Replace the shaker bar on the bag/cage pins inside the shaker assembly access door.

Note: Make sure that shaker bar mounting pipe lines up with the shaker shaft.

K. Secure the shaker bar to the cage pins by putting a flat washer over the cage pin and inserting a cotter pin through the hole in the cage pin and below the flat washer. This should be done on the first and last bag cages.

L. Insert the shaker shaft into the shaker bar mounting pipe and insert the clevis pin through the holes in both.

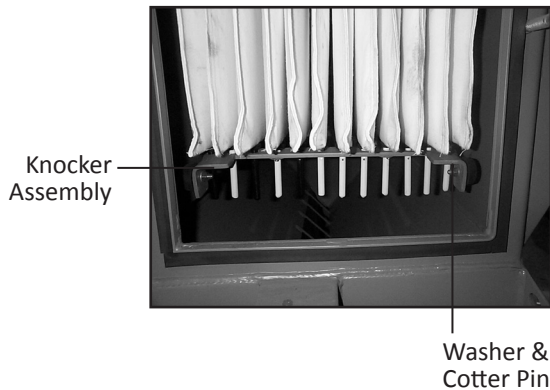


Note: To line up the clevis pin holes on the shaker shaft and the shaker bar mounting pipe, turn the eccentric bearing on the bag shaker gear box by hand until the clevis pin drops through the holes.

M. Secure the clevis pin through the shaker shaft and the shaker bar mounting pipe with a cotter pin.

N. Check all cotter pins, washers, and grommets and then install shaker assembly access door.

BAG CHANGE PROCEDURES



- O. Replace the rubber ended knocker bar assembly on the bag cage pins inside the side access door.
- P. Secure the rubber ended knocker bar assembly to the cage pins by putting a flat washer over the cage pin and then inserting a cotter pin through the hole in the cage pin and below the flat washer. This should be done on the first

- Q. Replace the side access door.

Note: Repair or replace any damaged gaskets before installing the top access door. Damaged gaskets can allow dust to leak into the clean side of the filter bags. This can cause serious damage to the vacuum pump.

DUST PASSAGE FILTER CHANGING PROCEDURES

1. Removal

- A. Disconnect all power from unit.
- B. Remove the Top Access Cover.
- C. With a 9/16" wrench, remove the bolt that holds the end plate on the filter assembly.

Note: Be careful not to drop any foreign objects such as nuts or washers into the bag/cage. If you do, they must be removed or they will cause damage to the vacuum pump.

- D. Carefully lay the end plate to the side and remove the three filters.
- E. Inspect filters for holes or damaged seals. If any, replace with new filters.

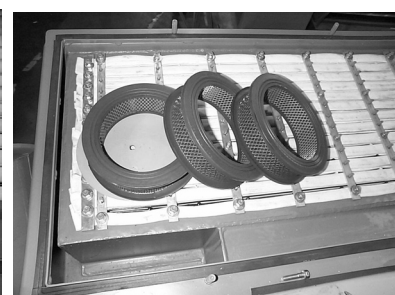
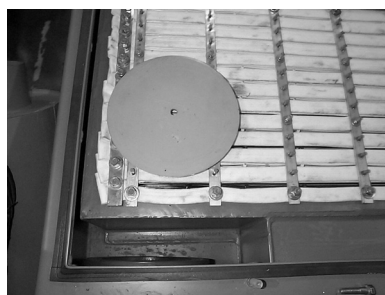
2. Filter Preparation

- A. Wash with commercial detergent in warm water and rinse clean.
- B. Lay filter on it's side, so water will drain from end caps.
- C. Allow filter to dry completely
- D. Spray filter on inside and outside with "FILM-COR" adhesive or other suitable oil, making sure all media has been coated or submerge filter in "FILM-COR" adhesive or other suitable oil.
- E. Remove immediately, lay filter on it's side and Allow to drain thoroughly.
- F. Wipe free any excess adhesive lodged in mesh or blow excess adhesive from filter.
- G. Filter is then ready to reuse.

DUST PASSAGE FILTER BOLT



END PLATE



DUST PASSAGE FILTER CHANGING PROCEDURES

3. Installation

A. Before installing filters, be sure that the area is wiped clean of all dirt and dust.

Note: Be sure to get all dirt and foreign particles wiped up and clean. Failure to do so may cause serious damage to the vacuum pump.

B. Place the three filters back on the filter guide, making sure they are all lined up correctly.

C. Reinstall the endplate and bolt and secure tightly.

D. Check all gaskets and replace if damaged.

Note: Repair or replace any damaged gaskets before installing the top access door. Damaged gaskets can allow dust to leak into the clean side of the filter bags. This can cause serious damage to the vacuum pump.

E. Install Top Access Cover and tighten down.

F. Reconnect power supply.

G. You are now ready to use your **Hi-Vac®**.

DUST PASSAGE FILTER BOLT



END PLATE



TENSIONING V-BELT DRIVES

Without exception, the most important factor in the successful operation of a V-belt drive is proper belt tensioning. To achieve the long, trouble-free service associated with V-belt drives, belt tension must be sufficient to overcome slipping under maximum peak load. This could be either at start or during the work cycle. The amount of peak load will vary depending upon the character of the driven machine or drive system. To increase total tension, merely increase the center distance. Before attempting to tension any drive, it is imperative that the sheaves be properly installed and aligned. If a V-belt slips, it is too loose. Add to the tension by increasing the center distance. Never apply belt dressing as this will damage the belt and cause early failure.

A. Step 1

Reduce the center distance so that the belts may be placed over the sheaves and in the grooves without forcing them over the sides of the grooves. Arrange the belts so that the top and bottom spans have about the same sag. Apply tension to the belts by increasing the center distance until the belts are snug.

B. Step 2

Operate the drive a few minutes to seat the belts in the sheave grooves. Observe the operation of the drive under its highest load condition (usually starting). A slight bow of the slack side of the drive indicates proper tension. If the slack side remains taut during the peak load, the drive is too tight. Excessive bowing or slippage indicates insufficient tension. If the belts squeal as the motor comes on or at some subsequent peak load, they are not tight enough to deliver the torque demanded by the drive machine. The drive should be stopped and the belts tightened.

C. Step 3

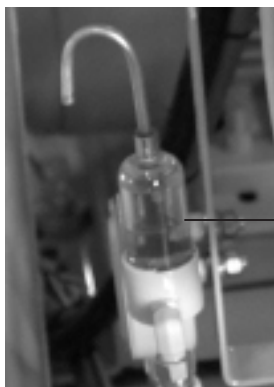
Check the tension on a new drive frequently during the first day by observing the slack side span. After a few days of operation, the belts will seat themselves in the sheave grooves and it may become necessary to readjust so that the drive again shows a light bow in the slack side.



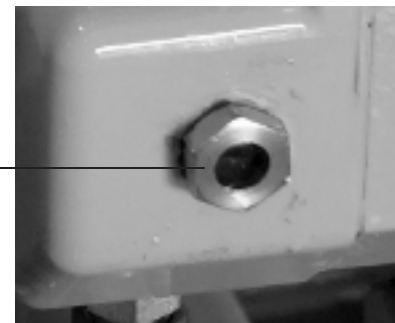
ADJUSTING OIL LEVEL SWITCH



Before adjusting oil level switch, assure the “blower” (vacuum pump) has the correct amount of oil as per the blower manual located in the manufactures bulletins section of this manual. You should see the oil level in the middle of the site glass.



OIL LEVEL



1. Check the Oil Level Switch. The oil should be filled to 1/4” from the top.
2. Loosen the Oil Level Switch bracket and Slide up or down to adjust to the level of the site glass on the vacuum pump (blower).
3. The oil line in the Oil Level Switch should be on the same level as the site gauge for the switch to function properly.
4. Tighten down Oil Level Switch bracket when site gauge and Oil Level Switch is set.

ADJUSTING THE SENSITIVITY OF THE LEVEL PROBE



Every standard **Hi-Vac®** comes with a Drexelbrook Level Probe. This probe is used for wet or dry applications. The sensitivity of the probe may need to be adjusted according to the material that is filling the hopper or if the probe is replaced.

The Drexelbrook Level Probe used on the **Hi-Vac®** units has a level detection range from approximately 6 inches from the probe tip to a level that applies pressure on the probe tip.

The level probe sensitivity may need to be adjusted to get the desired level of your particular material in the hopper .

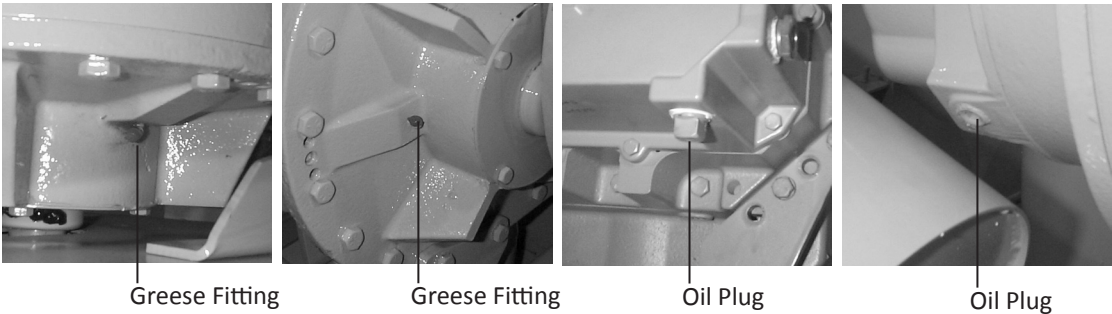
To adjust the sensitivity, refer to the manufacturer's manual.

MAINTENANCE INSTRUCTIONS

1. LUBRICATION INTERVALS

A. Positive Displacement Vacuum Pumps (Blowers)

1. Drain oil reservoir and replace with new oil every 500 hours of operation. **Depending on the model of blower, Oil plug may vary in location. Check your blower manual for exact location.**
2. Grease lubricated bearing should have the grease replenished every 500 hours of operation, but it should be noted that excessive grease will cause overheating. The escape vent must not be allowed to become blocked by solidified grease. **Depending on the model of blower, Grease fittings may vary in location. Check blower manual for exact location.**

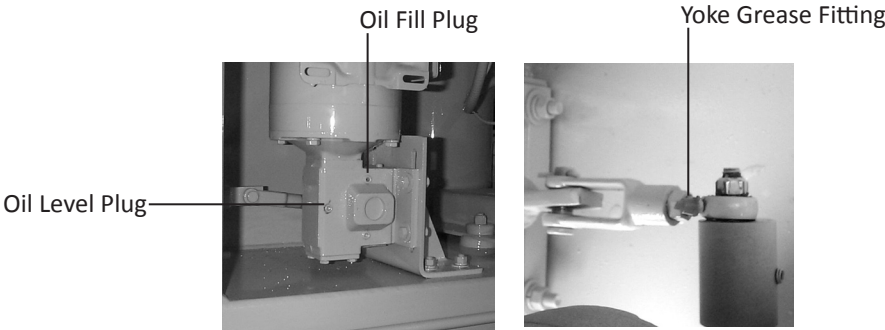


B. Bag Shaker Gearbox

1. Drain oil and replace every 1000 hours of operation.

C. Bag Shaker Yoke and Rod End Bearing

1. Grease every 500 hours of operation.



D. Electric Motor

1. Follow the recommendations of the motor manufacturer’s manual located in the component manual section.

Note: Record the performed maintenance on “Lubrication Maintenance Record Form”.

RECOMMENDED LUBRICANTS**1. Positive Displacement Vacuum Pump (Blowers)**

- A. Follow the recommendations of the blower manufacturer's manual located in the "Manufactures Manuals" section.
- B. Bearings shall use a No. 2 bearing grease.

2. Bag Shaker Gearbox

- A. Follow the recommendations of the gearbox manufacturer's manual located in the "Manufactures Manuals" section.
- B. Shaker Rod End shall use a No. 2 bearing grease.

3. Electric Motor

Follow the recommendations of the motor manufacturers manual located in the "Manufactures Manuals" section.

Lubrication Maintenance Record

Owner: _____

Hi-Vac® Serial # HV- _____ Model: _____

Maintenance Performed By: _____ Date: _____

Hi-Vac® Hour Meter Reading: _____ Hours

Lubrication Performed	Oil Drained & Changed	Oil Added	Greased
Vacuum Pump			
Bag Shaker Gearbox			N/A
Bag Shaker Drive Yoke	N/A	N/A	
Bag Shaker Rod Bearing	N/A	N/A	
Electric Motor	N/A	N/A	



PREVENTIVE MAINTENANCE

PREVENTIVE MAINTENANCE



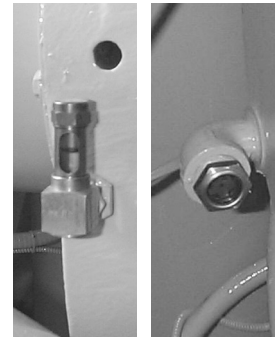
DAILY CHECKS

Perform the daily maintenance checks listed below and record on record sheet 1.

A. Vacuum Pump Oil Level (with machine NOT running):

Checking the vacuum pump oil level is critical and should be done frequently. Some vacuum pumps have oil level sight gauges, and others have oil level plugs. Refer to the vacuum pump's maintenance manual located in the manufactures bulletins section, to determine proper oil level requirements. If oil is needed, see "Recommended Lubricants" in the "Maintenance" section.

Note: Powerhead must be on level surface to get an accurate oil level reading.



Oil Site Plugs

B. Dust Discharge (with machine running)

Inspect the silencer for visible dust in the air stream.

Note: Shut the unit off immediately if dust is present. Any dust discharge should be corrected immediately to protect the vacuum pump.

1. Check filter bags for rupture or leaks by removing the top access door and looking for any signs of dust on top of the filter bags or under the inside of the top access door.
2. Check broken bag detector filters in top access door for rupture or leaks.



Silencer

C. Mechanical Vacuum Relief Valve (with machine running)

Check vacuum relief valve for proper operation. With the machine running in a "no load" condition, slowly block off power head inlet until 17" of mercury (at sea level) is indicated on the vacuum gauge. Relief valve should remain closed. Continue to block off powerhead inlet while watching vacuum gauge. Relief valve should open at 18" of mercury (at sea level) +/- 1/2 inch. Record where valve opens in inches of Hg.

Note: Do not check relief valve with hand! You will hear the in rush of air when the valve opens.

Note: Under no circumstances should the powerhead be used with a valve that opens higher than 18" of mercury.



Relief Valve

D. Bag Shaker Operation (with machine running)

Turn off machine by pressing the "Blower Stop" push button. The bag shaker should shake the bags each time your Hi-Vac® is turned off.

PREVENTIVE MAINTENANCE



WEEKLY CHECKS

Perform the weekly maintenance checks listed below and record on Record Form 2.

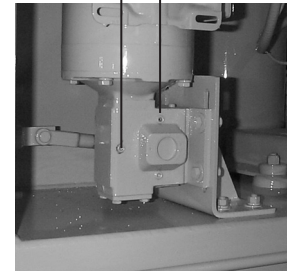
A. Belt Tension

Remove belt guard and check tension per “Tensioning V-belt Drives” in the maintenance section.

B. Bag Shaker Gearbox Oil Level

Turn control power “off”. Remove oil level plug and inspect level. Add as required per the instructions located in the gearbox manual in the manufacture’s bulletins section of this manual.

Oil Level Plug Oil Fill Plug



C. Shaker Diaphragm Gasket

Where the shaker drive shaft goes through the powerhead shell there is a rubber diaphragm. Visually inspect this area for signs of aging or possible ruptures. Replace if worn or torn!

Diaphragm



D. Electric Cable

Visually inspect all electrical conduit, cables, and connections for signs of abrasions or breaks.

E. Rubber Flap Seals

At the bottom of the linear separator and the bag house are rubber flap seals. Visually inspect the rubber flap seals by removing the appropriate access doors and/or removing the end dump hopper. Visually inspect to insure that they have not been pulled in or damaged.

Flap Seals



F. Level Probe

Check level probe for operation by touching the probe. Control panel must be on with the blower OFF. The “Hopper Full” light will turn “on” on the control panel.



Level Probe

G. Vacuum Leaks

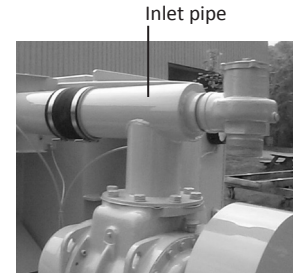
Inspect all openings for possible damage to gaskets. With machine running, listen for audible leaks around doors, hose connections, flanges, etc., and repair as required.

MONTHLY CHECKS

Perform the monthly maintenance checks listed below and record on Record Form 3.

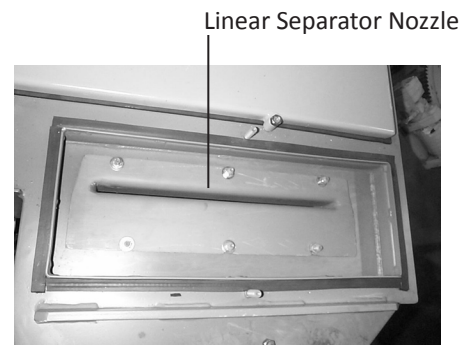
A. Vacuum Pump Lobe Wear

Remove the vacuum pump inlet pipe and inspect blower lobes for wear.



B. Linear Separator Nozzle

Remove Linear Separator Access Door and inspect the nozzle for wear. Replace when worn through.

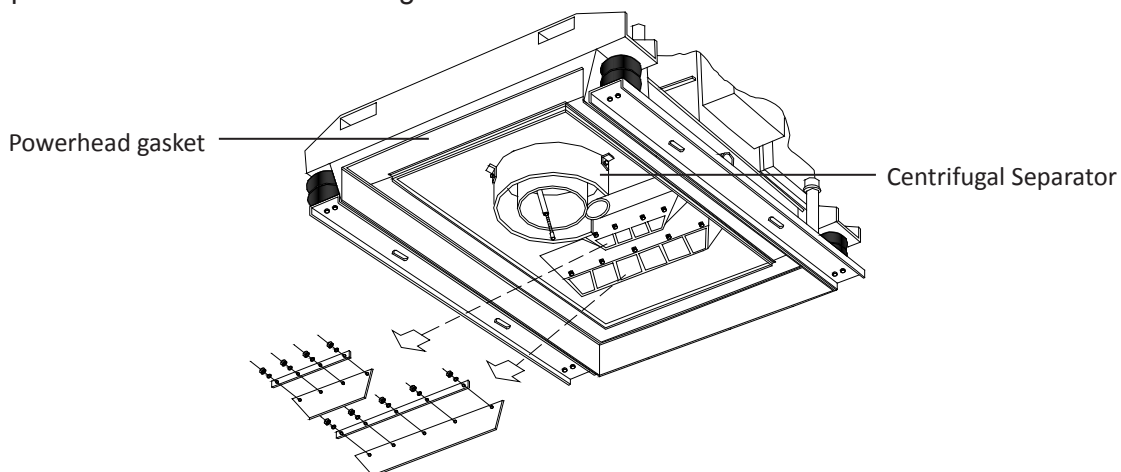


C. Centrifugal Separator

Remove end dump hopper or remove side access door (fixed hopper) and inspect separator ring on bottom of your Hi-Vac® powerhead for signs of wear. Replace Before it is worn through.

D. Powerhead Gasket

Remove end dump hopper or remove hopper side access door (fixed hopper). Inspect gasket at bottom of your Hi-Vac® powerhead for positive seal against the hopper and for possible wear due to air leakage.



PREVENTIVE MAINTENANCE



Lubrication / Maintenance Record Record Form 1 - Daily

Owner: _____

Hi-Vac® Serial # HV- _____ Model: _____

Maintenance Performed By: _____ Date: _____

Hi-Vac® Hour Meter Reading: _____ Hours

Checks Performed	Needs No Maintenance	Maintenance Needed	Maintenance Performed
(A) Vacuum Pump Oil			
(B) Dust Discharge			
(C) Mechanical Relief Valve(s) at "Hg"			
(D) Bag Shaker			



PREVENTIVE MAINTENANCE

Lubrication / Maintenance Record Record Form 2 - Weekly

Owner: _____

Hi-Vac® Serial # HV- _____ Model: _____

Maintenance Performed By: _____ Date: _____

Hi-Vac® Hour Meter Reading: _____ Hours

Checks Performed	Needs No Maintenance	Maintenance Needed	Maintenance Performed
(A) Belt Tension			
(B) Bag Shaker Gearbox Oil Level			
(C) Shaker Diaphragm Gasket			
(D) Electric Cable			
(E) Rubber Flap Seals			
(F) Level Probe			
(G) Vacuum Leaks			



**Lubrication / Maintenance Record
Record Form 3 - Monthly**

Owner: _____

Hi-Vac® Serial # HV- _____ **Model:** _____

Maintenance Performed By: _____ **Date:** _____

Hi-Vac® Hour Meter Reading: _____ **Hours**

Checks Performed	Needs No Maintenance	Maintenance Needed	Maintenance Performed
(A) Vacuum Pump Lobe Wear			
(B) Linear Seperator Nozzle			
(B) Centrifugal Separator			
(C) Powerhead Gasket			

The following are some problems which may arise and ways to correct them.

- 1 = Bag shaker, drive motor overloads tripped
- 2 = Bag shaker, excessive dirty bag shut down cycles
- 3 = Bag shaker, not cycling when differential above 20" H₂O
- 4 = Bag shaker, not starting
- 5 = Blower, "Blower Oil Level Low" LED is lit **
- 6 = Blower, drive motor overloads tripped
- 7 = Blower, not starting
- 8 = Blower, "Temperature High Limit" LED is lit **
- 9 = Filter bags, dirty
- 10 = Filter bags, "Bag House Fault" LED is blinking **
- 11 = Filter bags, holes in
- 12 = Filter bags, "Dust Passage" LED is lit **
- 13 = Hopper, "Bottom Dump" LED is lit **
- 14 = Hopper, "End Dump" LED is lit **
- 15 = Rotary airlock, drive motor overloads tripped
- 16 = Screw conveyor, drive motor overloads tripped
- 17 = Vacuum, continuous high
- 18 = Vacuum, sudden loss of
- 19 = **Hi-Vac®** will not stop when hopper is full
- 20 = Control panel circuit breaker blows immediately when blower start button is pressed.

** "LED" refers to solid state module (SSM) or programmable logic controller (PLC), if your equipment does not have a "SSM" or "PLC", these LED's are replaced with indicator lights and/or reset buttons.

Note: Some problems listed above may not apply to your equipment.

PREVENTIVE MAINTENANCE



<u>PROBLEMS</u>	<u>POSSIBLE CAUSES</u>	<u>CHECK FOR</u>	
1,4,7	<p>Bag Shaker Motor Overloads tripped</p> <p>Excessive current draw in shaker motors due to malfunction in system</p>	<p>A.</p> <p>B.</p> <p>C.</p>	<p>Drive Mechanism - binding or misalignment.</p> <p>Gearbox lubrication</p> <p>Rod end bearing lubrication</p>
<p>NOTE: If tripped, they must be reset inside the control panel. Remember, the bags should shake each time the HiVAC is shut down, either manually or automatically.</p>			
2,3,4	<p>Broken Differential Pressure Line (the black plastic tubing)</p> <p>If the black plastic tubing is damaged in any way, i.e. cracked, crimped, melted and collapsed or torn out of a connector, false readings generally are as follows:</p>	<p>A.</p> <p>B.</p>	<p>If the high pressure (dirty side of the filter bags) is broken, you will have excessive shutdown bag shake cycles. If these lines are crimped (no air passage), you may never shut down on dirty bags.</p> <p>If the low pressure (clean side of the filter bags) is broken, the pressure differential gauge will read "0" and a bag shaking cycle will not be initiated when the pressure difference across the bags reaches 20" H₂O</p>
5,7	<p>Blower Oil Level Low</p> <p>If the oil level in the blower drops to a critical level.....</p>	<p>A.</p> <p>B.</p> <p>C.</p> <p>D.</p>	<p>Oil level is at proper level in sight glass of blower</p> <p>Oil level switch is at proper adjustment (the oil level in the switch should be approximately 1/4" below the top inside of the switch itself and even with the sight glasses of the blower if filled to proper level</p> <p>Pool of oil below blower indicates external leakage. Repair as required.</p> <p>No sign of external leak. A certain amount of oil will be lost naturally and if left unattended will eventually cause the switch to trip. If the unit shuts down frequently because of this, it is possible that there is an internal leak in the blower. Refer to the blower manual for proper corrective action.</p>
7		A.	Check for "Blower Oil Level" indication.
7		A.	Check for "Blower Temperature high" indication.
7		A.	Check for one of the high material level indicators.
7		A.	Check for "Dust Passage" indication.
7,8,10,17,18	<p>Dirty Filter Bags</p> <p>During operation, whenever pressure differential across bags reaches 20" water column, the HiVAC will shut down and shake bags, then restart. This is a normal operation. If this occurs too frequently.....</p>	<p>A.</p> <p>B.</p> <p>C.</p>	<p>"Cake" on filter bags (caused by conveying hot moist material). Do not convey Hot, Moist material. Replacement of bags is necessary. (see bag change procedures.)</p> <p>Impregnation of material is common after prolonged use of the HiVAC. This is material absorbed into the fabric which will not shake out. Replacement of bags is necessary. (see bag change procedures.)</p> <p>Hole or broken line in the differential tubing on the dirty side.</p>

Note: Some problems listed above may not apply to your equipment.



PREVENTIVE MAINTENANCE

<u>PROBLEMS</u>	<u>POSSIBLE CAUSES</u>	<u>CHECK FOR</u>
7,12	Broken bag Detector (dust passage) Indicating filter bag starting to leak	<p>A. Small amount of leakage. May be stopped by retightening the hold down retainers on top of bags. Broken bag detector filter must be serviced. See "servicing instructions" for broken bag detector filters.</p> <p>B. No amount of leakage observed. There will always be a certain amount of leakage regardless of bag condition. After a time, this will collect on broken bag detector filters requiring them to be serviced. See "servicing instructions" for broken bag detector filters.</p> <p>C. Large amounts. Usually indicate worn or torn filter bags. It is recommended, at this time, to replace all filter bags reducing bag maintenance time.</p>
8,17,18	Vacuum Relief Valve Jammed In Closed Position	Inspect and correct malfunction. Possibly there is something lodged in the valve.
8,17,18	Obstruction in the conveying hose	Inspect hose and free obstruction from hose by raising and impacting heavy part of hose (where plugging is probably located) on floor while unit is running. On more severe cases, turn plugged hose section end for end for a reverse air purge through hose. Material with clay or other bonding material which has consistency of mud may build up inside the conveying hose adding more moisture for slurry handling. Impact hose on floor as above.
8,17,18	Obstruction in linear separator	With HiVAC turned off, remove the linear separator door located on top of the powerhead. Inspect for and remove any obstruction.
8,18	Blower Temperature High The air discharged by the blower gets above 350 degrees F.	<p>A. Low blower speed which reduces the amount of cooling air through blower. Usually caused by loose belts. (Refer to "tensioning V-belts" section in this manual.</p> <p>B. High vacuum caused by operating for long periods of time at vacuums in excess of 16" Hg.</p>
8,18	Slipping of V-belts.	Check the belt tension and tighten if necessary. Should the belt be worn, replace all belts with a matched set. (Refer to "tensioning V-belts" section in this manual.
8,18	Worn Vacuum Pump Lobes or Housing	The greater the wear, the less vacuum achieved and the hotter a vacuum pump will run.
<p>NOTE: IMPORTANT!!!! Vacuum Pump Wear. Continual visible dust passage through vacuum pump due to a filter bag rupture or leak will cause premature vacuum pump failure. At the first sign of dust being discharged from the HiVAC, prompt elimination of the dust passage is necessary.</p> <p>EXAMPLE: If the HiVAC has been used extensively and a bag rupture is found, we recommend changing all filter bags to reduce bag maintenance time.</p>		
9,11	Leakage past flap seal	At the bottom of the bag house compartment is a rubber flap seal. Visually inspect the rubber flap seal for signs of air leakage, wear, tears, or if it has been pulled in.
13,14	Material collecting hopper is full	Empty hopper and reset controls by pressing "Stop/Reset" push button.

Note: Some problems listed above may not apply to your equipment.

PREVENTIVE MAINTENANCE



<u>PROBLEMS</u>	<u>POSSIBLE CAUSES</u>	<u>CHECK FOR</u>
13,14	Instrument indicates alarm at all times	<ul style="list-style-type: none"> A. Coating build-up on sensing element (HLFS) - needs longer coat shield. Consult factory. B. Sensing element not "seeing" material (LLFS) C. Short in coax cable (HLFS). See section 10-DP.2.5 D. Open in the coax cable (LLFS). See section 10-DP.2.5 E. Defect in sensing element - See section 10-DP.2.5 F. Loss of power (HLFS) See electrical schematic. G. Improper wiring - See electrical schematic. H. Improper Calibration - See section 10-DP.1.3 I. Electronic Malfunction - See section 10-DP.2.2 J. Moisture in Condulet - See section 10-DP.2.1 K. Moisture in Cable Conduit - section 10-DP.2.4
13,14,15	Instrument In Calibration Is Not Stable	<ul style="list-style-type: none"> A. Open in Coax Cable - See section 10-DP.2.5 B. Improper Wiring - See Electrical Schematic C. Insufficient signal from sensing element - need longer insertion. D. Set-point is beyond the tuning - Consult factory E. Electronic Malfunction - See section 10-DP.2.2 F. Moisture in Condulet - See section 10-DP.2.4 G. Moisture in Conduit Cable - section 10-DP.2.5
13,14,19	Instrument Gives False Alarm	<ul style="list-style-type: none"> A. Improper Calibration - See section 10-DP.1.3 B. Loose wiring - See electrical schematic C. Electronic Malfunction - See section 10-DP.2.2 D. Static sparks causing electronic damage - Need spark protection circuit - consult factory.
13,14,19	Instrument Operates Intermittently	<ul style="list-style-type: none"> A. Improper Calibration - See section 10-DP.1.3 B. Loose wiring - See electrical schematic C. Electronic Malfunction - See section 10-DP.2.2 D. Static sparks causing electronic damage - Need spark protection circuit - consult factory.
18	Conveying Hose Worn Through	Bleeding in excessive amounts of air somewhere between pickup nozzle and vacuum pump.
18	Poor Sealing	Between powerhead, hopper, and doors due to improper seating on damaged gasket.

Note: Some problems listed above may not apply to your equipment.

ELECTRICAL

ACCESSORIES

MANUFACTURER'S MANUALS

