

# **BLAST CLEANING EQUIPMENT**

**OPERATING AND MAINTENANCE MANUAL**

**TITAN VACUUM BLAST SYSTEM**

## **MODELS COVERED**

**VB MINI**

## **CAUTION**

**IMPROPER USE OF PRESSURE BLAST CLEANING EQUIPMENT CAN BE EXTREMELY HAZARDOUS. THIS MANUAL IS PROVIDED TO ASSURE THE SAFE OPERATION OF THE TITAN VACUUM BLAST SERIES OF ABRASIVE BLAST CLEANING MACHINES. PLEASE READ CAREFULLY BEFORE PROCEEDING.**

**TITAN ABRASIVE SYSTEMS, INC  
308 VALLEY ROAD - PITMAN, PA 17964  
PHONE 570-648-4774 – FAX 570-648-8371  
<http://www.titanabrasive.com>**

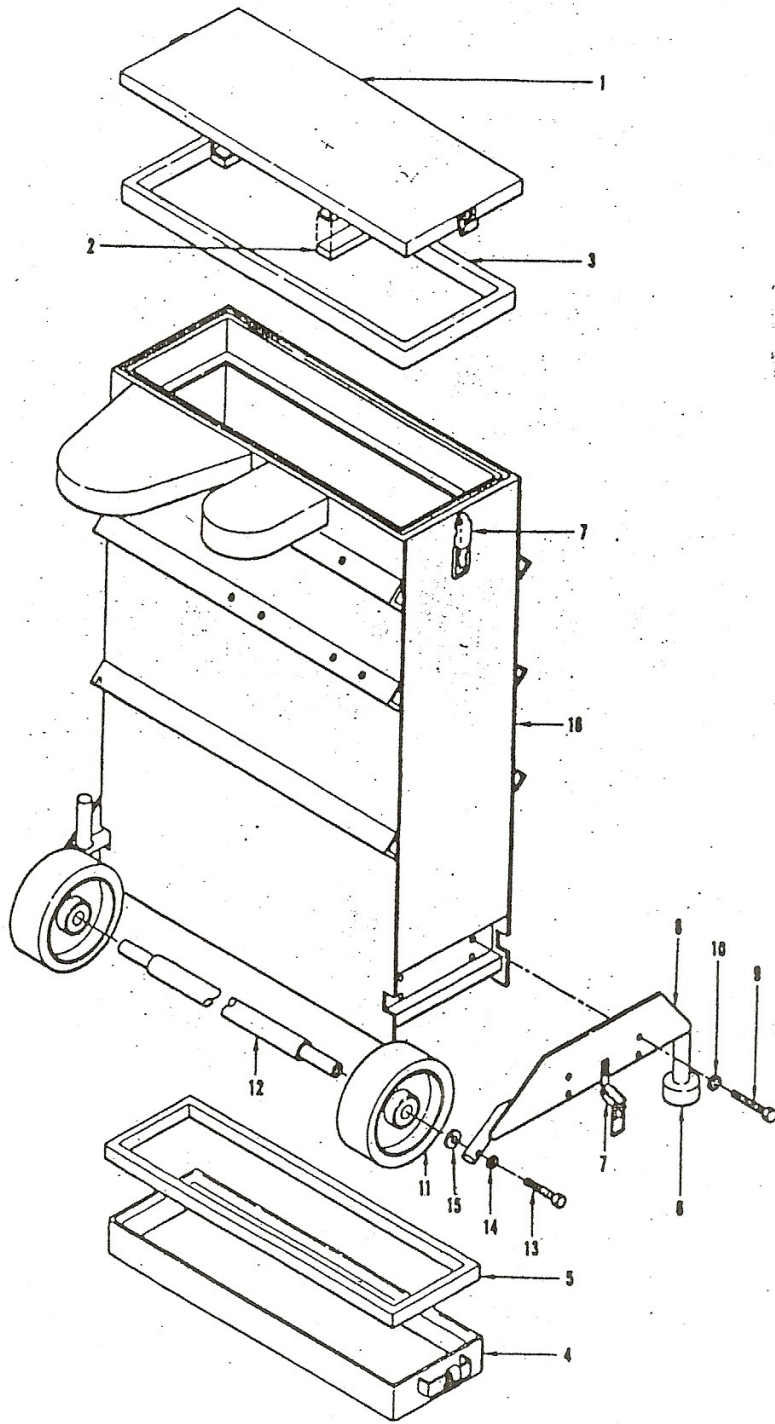


FIGURE 2 - CABINET ASSEMBLY

GROUP ASSEMBLY PARTS LIST (continued)

FIG & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY.
2	178023	CABINET ASSEMBLY (see Fig. 1-100)	REF
-1	178040	COVER: Top	1
-2	178041	PAD: Sponge Rubber	2
-3	911299	GASKET: Cover, Top	1
-4	178042	COVER: Bottom	1
-5	911298	GASKET: Cover, Bottom	1
-6	925003	PAD: Rubber	2
-7	929500	LATCH (attaching Parts)	4
		SCREW: Machine, self-tapping, steel cad-plated, 8/32 x 1/2" lg.	8
8-	178043	BRACKET: Wheel mounting (Attaching Parts)	2
-9		SCREW: Machine, cap hex-head, steel, cad-plated, 1/4-20x 1-1/2" lg.	8
-10		WASHER: Lock, split, steel, cad-plated, 1/4" ID	8
-11	940202	WHEEL: Rubber-tire, roller bearing, 5/8" bore	2
-12	178044	AXLE: (Attaching Parts)	1
-13		SCREW: Machine, hex head, steel, cad-plated, 3/8-16x2" lg.	2
-14		WASHER: Lock, split, steel, cad-plated 3/8" ID	2
-15		WASHER: Flat, steel, cad-plated, 3/8" ID	2
-16	178045	DUSTBOX	1

## TABLE OF CONTENTS

INTRODUCTION	5
GENERAL DESCRIPTION	7
DRY HONING	7
VB MINI	7
FUNCTIONAL DESCRIPTION	8
EXTERNAL GUN	8
RECLAIMER	8
DUST COLLECTOR	10
EXHAUSTER	10
INSTALLATION	11
OPERATION	12
SELECTION OF ABRASIVES	12
ABRASIVE LOADING	12
ROUTINE OPERATION	13
ROUTINE SHUTDOWN	13
STORAGE OR TEMPORARY NON-USE	14
PERIODIC MAINTENANCE	15
DAILY	15
WEEKLY	15
TROUBLESHOOTING	17
PARTS ORDERING INFORMATION	19
EXTERNAL GUN ASSEMBLY	20
MODEL "SE" EXHAUSTER INSTALLATION	21
MODEL "SX" EXHAUSTER INSTALLATION	22
MODEL "S" GENERAL ARRANGEMENT	23

## INTRODUCTION

This manual provides operation and maintenance instructions for the Cyclo-Blast Junior.

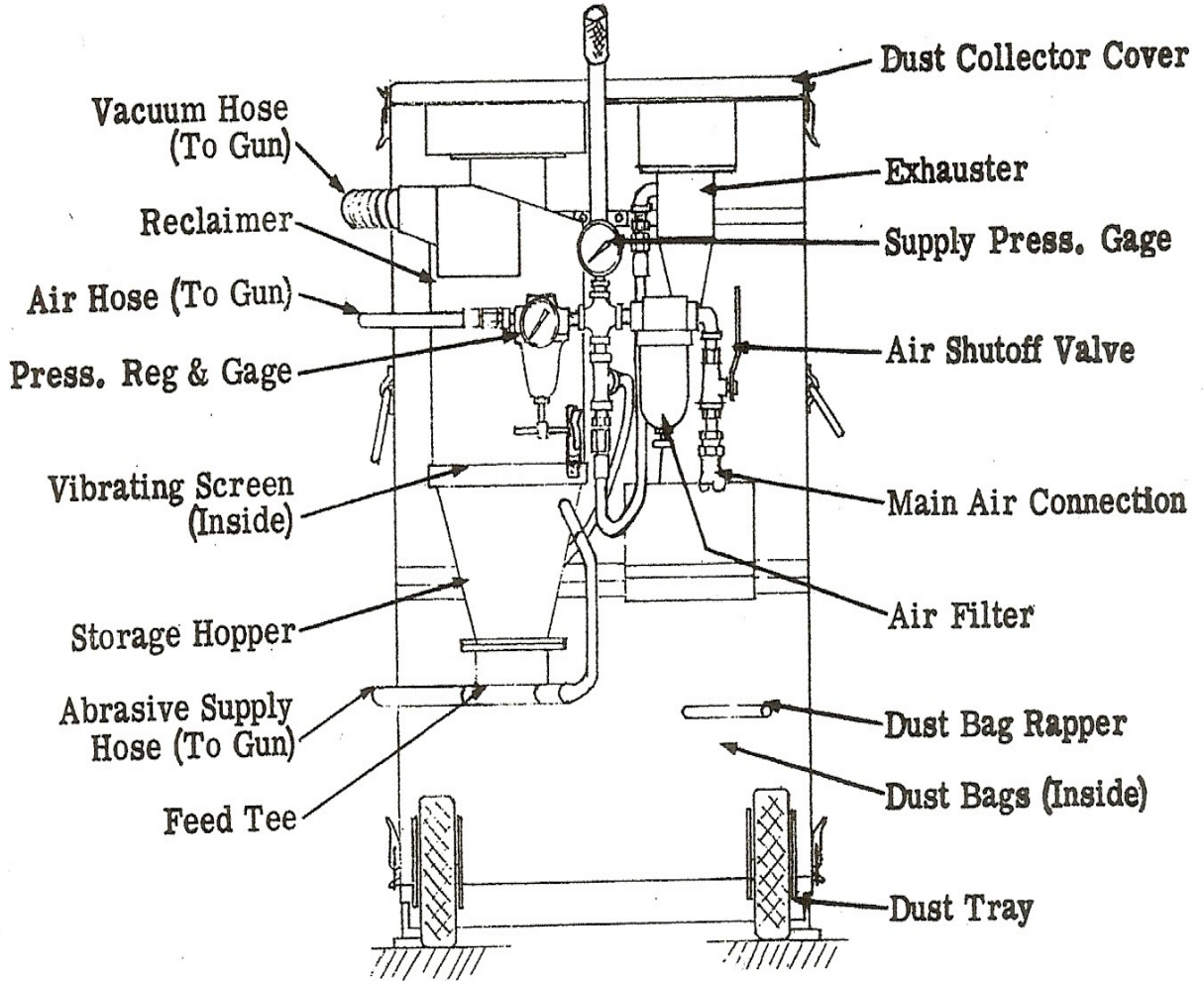
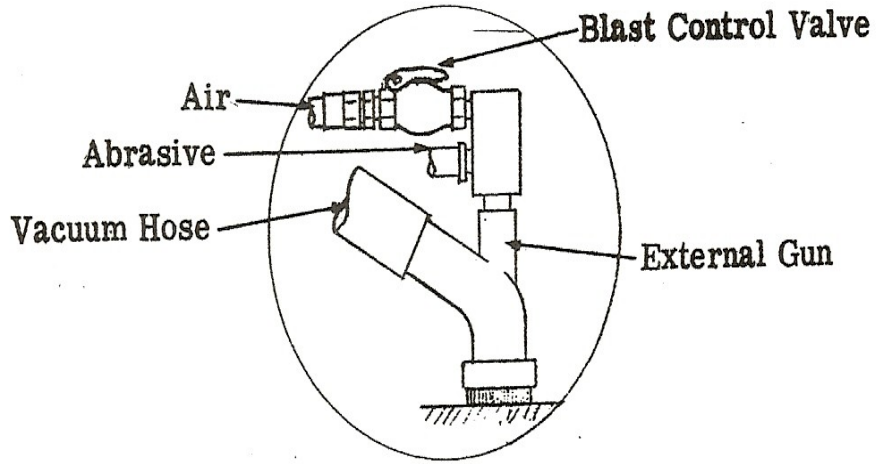
The VB Mini's are compact, portable dry honing machines available in three different models, as follows:

Model "S" = Standard VB Mini. Requires only compressed air supply of 80-90 cfm at 80-100 psi to operate.

Model "SE" = VB Mini with electric exhauster in place of the standard air-operated, ejector-type vacuum jet pump. Requires electrical supply of 115/1/60 in addition to reduced compressed air supply of 50 cfm at 80-100 psi to operate.

Model "SX" = VB Mini with explosion-proof electricals. Electrical and compressed air requirements the same as Model "SE".

All VB Mini's are factory tested and adjusted with a 3/16-inch air jet and 3/8-inch blast nozzle combination, 60-psi blasting pressure and 140-mesh glass beads.



## GENERAL DESCRIPTION

### DRY HONING

Dry honing is a process using dry fine abrasive particles to clean and provide a uniform finish. The abrasive particles are introduced into a high velocity air stream and propelled toward the surface (work piece) to be cleaned. The abrasive strikes the work piece at a high velocity and abrades away any rust, scale, carbon deposits, corrosion, paint or surface irregularities.

### JUNIOR DRY HONER

The VB Mini is a suction-type dry honer for continuous operation. It uses an external blast gun that covers the area being blasted and continuously removes the spent abrasive, dust and debris from the blast area.

The VB Mini is basically composed of several major components. These are the external blast gun, reclaimer, dust collector and exhauster. A more detailed description of these items is in the FUNCTIONAL DESCRIPTION Section.

The VB Mini's specifications are as follows:

Typical Cleaning Rate	2/3 square foot per minute
Abrasive Types:	Glass beads, 80 to 400 mesh Garnet, 80 to 300 mesh Aluminum oxide, 80 to 400 mesh
Abrasive Charge:	Five pounds
Air Consumption:	Model "S", 80-90 cfm at 80-100 psi Model "SE" & "SX", 50 cfm at 80-100 psi
Electrical Requirements:	Model "SE" & "SX" only, 115/1/60, 10 amps
Blasting Pressure:	40 to 100 psi adjustable
Hose Length:	20 feet

## FUNCTIONAL DESCRIPTION

### EXTERNAL GUN (See Abrasive Flow Block Diagram)

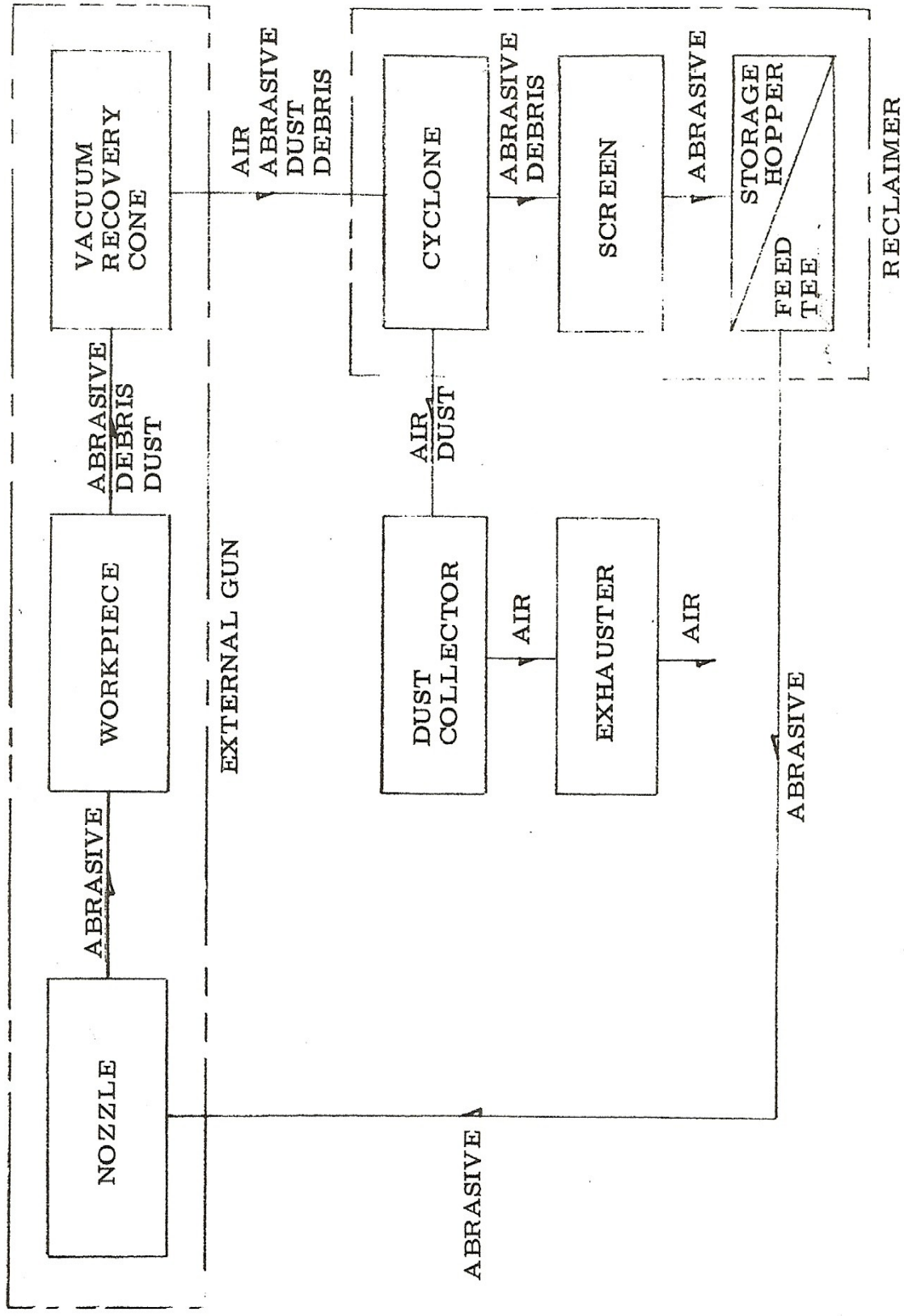
When the normally closed remote control blast valve is depressed, compressed air is routed to the venturi-shaped air jet in the gun. The air flows through the air jet at high velocity creating a suction at the point where the abrasive hose is connected to the gun. This suction draws abrasive from the feed tee, it mixes with the high velocity air and is propelled out the blast nozzle and strikes the work piece. The spent abrasive in addition to any dust and debris created is drawn out through the gun body and conveyed to the reclaimer by the exhauster. Note that the blasting is accomplished and contained within the gun body.

### RECLAIMER

The conveying air carrying the abrasive, dust and debris is drawn into the reclaimer cyclone tangentially and a spiraling motion is induced into the air stream. As the area of the cyclone is much greater than the conveying hose the velocity of the conveying air is reduced and the heavier particles fall out of suspension. The conveying air and dust are drawn out the top of the cyclone and routed to the dust collector by the exhauster. The remaining heavier particles fall onto the vibrating screen trapping the oversize particles. The re-usable abrasive falls through the screen into the storage hopper for immediate re-delivery through the feed tee to the gun.

The feed tee is fitted to the bottom of the storage hopper and it contains a porous disc. As the system is brought under a vacuum by the exhauster, a controlled quantity of air is drawn upward through the disc and it diffuses through the abrasive to prevent bridging. A metering orifice draws abrasive from a point above the surface of the disc, thus preventing circulating of any debris particles. When blasting, the abrasive flows freely through the feed tee into the conveying hose connected to the gun.

A suction by-pass line is connected between the feed tee and the storage hopper. When blasting ceases, the system is still under a vacuum and air is drawn backwards through the gun, abrasive hose, feed tee, by-pass line and into the storage hopper. This backward airflow clears the abrasive hose and prevents surging when blasting is started again. Airflow is reversed when blasting starts again and the by-pass line insures a balanced pressure between the storage hopper and feed tee. Balanced pressure allows the abrasive to fall freely through the feed tee and into the abrasive hose.



ABRASIVE FLOW BLOCK DIAGRAM

## DUST COLLECTOR

In the dust collector the dust-laden air from the reclaimer is drawn through the cloth filter bags, depositing the dust on the filter surface. The cleaned air passes through the exhauster and is discharged. Dust particles trapped by the cloth filter elements are periodically removed by use of a mechanical bag-shaking mechanism. When the shaker is operated, dust falls to the bottom of the housing and collects in a dust tray for disposal.

## EXHAUSTER

The exhauster creates the necessary vacuum to return the spent abrasive, dust and debris from the external gun through the vacuum hose and into the reclaimer. It carries the dust further into the dust collector before exhausting the conveying air to atmosphere.

The Model "S" exhauster is an air-operated, ejector-type, vacuum jet pump. Model "SE" exhauster is a hi-static electric blower. Model "SX" exhauster is an explosion-proof hi-static electric blower.

## INSTALLATION

As the VB Mini is a portable dry honer, the only installation required is hook-up which follows:

1. Connect compressed air supply hose to inlet valve at VB Mini. It is most important that the air supply hose is large enough to maintain proper pressure. For the Model "S" a supply of 80-90 cfm at 80-100 psi is required. For Models "SE" and "SX" a supply of 50 cfm at 80-100 psi is required.

**CAUTION:** The compressed air supply to the VB Mini must be as free of moisture as possible. Moisture entrained in the air stream will collect on the abrasive during blasting and eventually will clog the abrasive in the VB Mini. Normal line condensation is removed by the filter trap supplied; but if excessive moisture or oil is present in the air supply, install separator or preferably an after cooler at the compressor.

2. For models "SE" and "SX" only, connect the 25-foot electrical supply cord to 115/1/60, 10 amp source.

**NOTE:** The Model "SE" is furnished with a standard twist-lock plug. The Model "SX" is furnished without a plug due to the variable applications.

## OPERATION

### SELECTION OF ABRASIVES

Any standard commercial abrasives, within the sizes specified in the GENERAL DESCRIPTION may be used in the Titan VB Mini.

Spherical abrasives, such as glass beads, are used for general purpose cleaning and metal finishing where a comparatively bright sheen is desired.

Angular abrasive, such as aluminum oxide or garnet, generally clean or etch a surface faster than glass beads and produce a dull matte appearance. The choice between aluminum oxide, garnet or other angular abrasives is determined by the requirements of the particular application. Garnet is lower in cost than aluminum oxide, but has a faster rate of breakdown and this breakdown is more pronounced with blasting pressure settings over 30 psi. As pressure settings in the 40 to 50 psi range are commonly used for general purpose finishing, this breakdown rate becomes a significant factor. As a general guide, aluminum oxide is the most satisfactory choice unless contamination by dirty work pieces, oil or water becomes a problem which will result in requirement to change abrasive charge more often.

NOTE: In changing from one type of abrasive to another, always blow out the abrasive supply hose to the gun with compressed air.

### ABRASIVE LOADING

The abrasive capacity of the VB Mini is five pounds. This quantity should not be exceeded as plugging of the feed system will result. The VB Mini will perform with a lesser charge, though the supply will have to be replenished comparatively often. To load abrasive, proceed as follows:

1. Turn on air supply at VB Mini, pour five pounds of abrasive on flat clean surface (floor) and pick up by manipulating external gun over the abrasive.

Or,

Turn off air supply at VB Mini, remove storage hopper, pour five pounds of abrasive into hopper and reinstall hopper.

### ROUTINE OPERATION

1. Turn on air supply at VB Mini. For models “SE” & “SX” also turn on Electric exhauster.
2. Set pressure regulator to desired blast pressure (recommend 40 psi to start).
3. Firmly press the external gun to the surface to be blasted and press the control valve at the gun. Move the gun smoothly over the surface in a uniform pattern until the desired appearance is achieved. After releasing the control valve, hold gun in position for a few seconds to catch any spillage.

NOTE: Specially-shaped brushes are available for other than flat surfaces. See PARTS ORDERING INFORMATION.

### ROUTINE SHUTDOWN

1. Turn off air supply at VB Mini. For Models “SE” & “SX” also turn off electric exhauster.

## STORAGE OR TEMPORARY NON-USE

If VB Mini is not to be used for a period of more than three days or if it is to be put in storage, accomplish the following steps:

1. Disconnect source of compressed air and electric power, as applicable
2. Empty abrasive from storage hopper. Store abrasive in clean, dry place.
3. Using compressed air, blow out feed tee and abrasive supply hose.
4. Shake dust bags and empty dust tray.
5. Open drain valve and allow filter trap to drain completely. Close drain valve.
6. If VB Mini is to be put in storage, cover and store in clean, dry place.

## PERIODIC MAINTENANCE

### DAILY

1. Load VB Mini with fresh abrasive as previously described and discard used abrasive twice a day with constant use or once a day with intermittent use.
2. Shake dust bags clean every two hours. The exhauster, air or electric, must be shut off before shaking bags. Shake bags 20 quick strokes by swinging lever and sharply returning it to the normal position so bags are allowed to snap clean. After shaking bags, always empty dust tray under dust collector.

NOTE: The dust collector requires a break-in period to impregnate the bags with a layer of dust and achieve maximum efficiency. During break-in, reclaimer airflow is increased and some good abrasive is carried over to the dust collector. For the first 30 to 50 operating hours, if an excessive amount of good abrasive is noted in the dust tray before shaking bags, reload dust tray contents into VB Mini and then shake bags and empty dust tray. A second passage through the reclaimer should separate the abrasive from the dust.

3. Inspect screen for accumulated debris by unlatching the storage hopper, lifting out the screen and back-blowing or back-brushing until clean.
4. Drain filter trap.

### WEEKLY

1. Inspect abrasive supply and vacuum hoses for wear by feeling along the length of the hose for soft spots. Soft spots are indications of excessive wear and when found the hose should be replaced. As hoses will wear more rapidly at sharp bends, future wear will be minimized if hoses are arranged so bends are as gentle as possible. If worn spots are near either end of the hose, the hose may possibly be salvaged by removing any fittings, cutting off the defective section and replacing the remaining length.
2. Inspect external gun for wear. When blast nozzle is worn 1/16-inch oversize, replace. See PARTS ORDERING INFORMATION.

3. While cleaning screen, inspect screen gasket for damage and proper fit. Air leaks at this point, as from a damaged gasket, will impair the reclaimer efficiency and cause good abrasive to be carried over to the dust collector.

At the same time inspect feed tee porous stone visible at the bottom of the storage hopper. If caked abrasive is noted clinging to the stone, the stone is clogged with oil or water and must be replaced. To replace, unbolt feed tee from storage hopper, remove sealing compound from around the stone and remove the stone. Be sure to reseal the circumference of the stone when replaced, or air will be drawn up and around the stone instead of diffusing through the stone.

4. On the Model "S" only, disassemble the jet pump using spanner wrench provided and clean with a soft cloth. When reassembling, be sure to replace the shims as they are used to calibrate the pump.

## TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Screen vibrator not vibrating	No air flow	Clean or replace orifice
	Defective vibrator	Replace
Good abrasive in dust tray	Leaky screen gasket	Replace gasket
	Debris in cyclone	Remove debris
Abrasive escaping into work area	Defective dust bag	Replace
	Defective vacuum hose	Replace
	Worn brush on gun	Replace
No air or abrasive flow	Leaky gaskets	Locate and repair
	Main air valve closed	Open valve
	Gun clogged	Disassembly and clean, replace parts as necessary
Air flow, but intermittent or no abrasive blast	Oily lumps or debris in storage hopper	Dump abrasive and recharge
	Clogged screen	Remove screen and back-blow or back-brush clean
	Feed tee porous disc clogged	Replace
	Feed tee metering orifice clogged	Blow clear with compressed air
	Abrasive hose clogged from oily abrasive	Remove, clean with detergent and water, rinse and thoroughly dry
	Plant air pressure less than 40 psi	Increase air pressure; 80-100 psi recommended
	Plant air pressure more than 110 psi	Reduce air pressure; 80-100 psi recommended
	No abrasive in machine	Recharge
	Overfilled hopper	Dump abrasive and recharge to proper level

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Abrasive becomes wet or oily rapidly	Work pieces wet or oily	Pre-clean work pieces
	Water or oil entering through air supply	Drain filter
	Abrasive too fine	Use coarser abrasive and/or lower blast air pressure

Abrasive/vacuum hose wears rapidly	Hose kinked or bent	Straighten as much as possible
	Blast nozzle worn 1/16-inch oversize	Replace

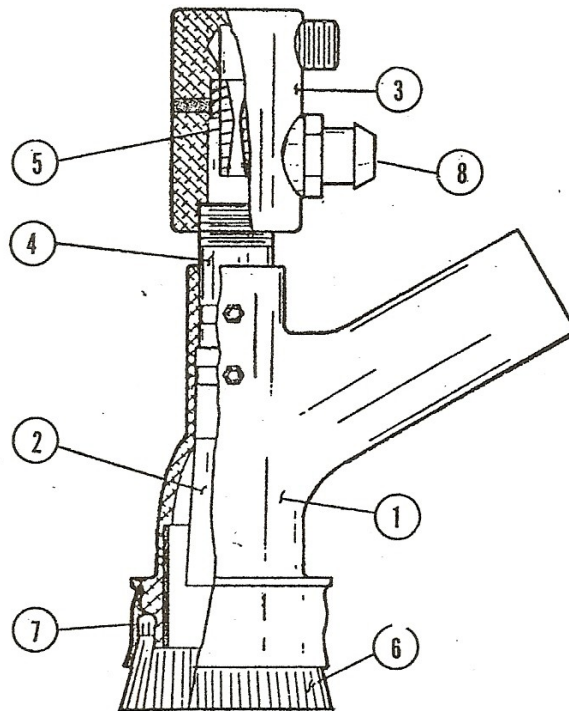
#### PARTS ORDERING INFORMATION

The parts listed below will wear or could become damaged and should be kept in stock to minimize downtime. The number listed under SPARES column is the quantity recommended for 1000 hours of operation.

To order other parts refer to the illustrations and drawings in the rear of the manual. When ordering from illustrations, use number listed under PART NO. column. When ordering from drawings, use stock number listed under STK. NO. column of BILL OF MATERIAL.

When ordering any parts always give Model No. and Serial No. of unit.

<u>SPARES</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	943702	Individual dust bag
1	173021	Vibrating screen
1	911257	Vibrating screen gasket
1	937500	Screen vibrator
2	943500	Porous stone
1	224216	5/8"x20'-6" Abrasive hose
1	908200	1-1/2"x20'-0" Vacuum hose
1	247010	3/16" Air jet
3	244261	3/8" Nozzle
1	248000	Inner cone
5	912000	Straight brush
2	934500	Straight brush retainer

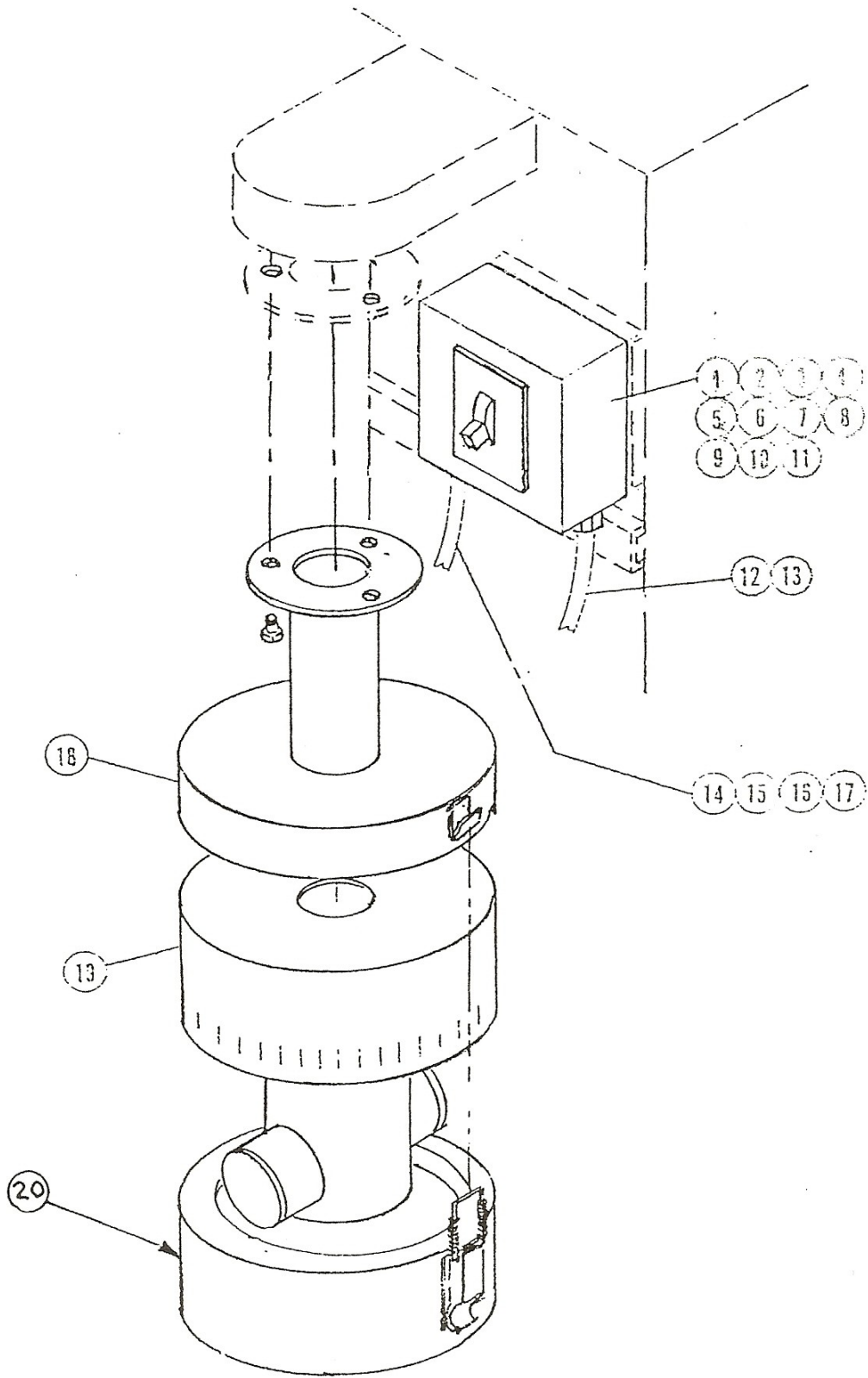


<u>Item No.</u>	<u>Part No.</u>	<u>Description</u>
-	243053	External Gun Assy, Complete
1	248200	Gun Body with Rubber Liner
2	248000	Inner Cone
3	243051	Suction Gun (includes Items 4 & 5)
4	244261	3/8" Nozzle
5	247010	3/16" Air Jet
6	912000	Straight Brush
7	934500	Straight Brush Retainer
8	248756	Adapter

The following are alternatives to Item Nos. 6 & 7:

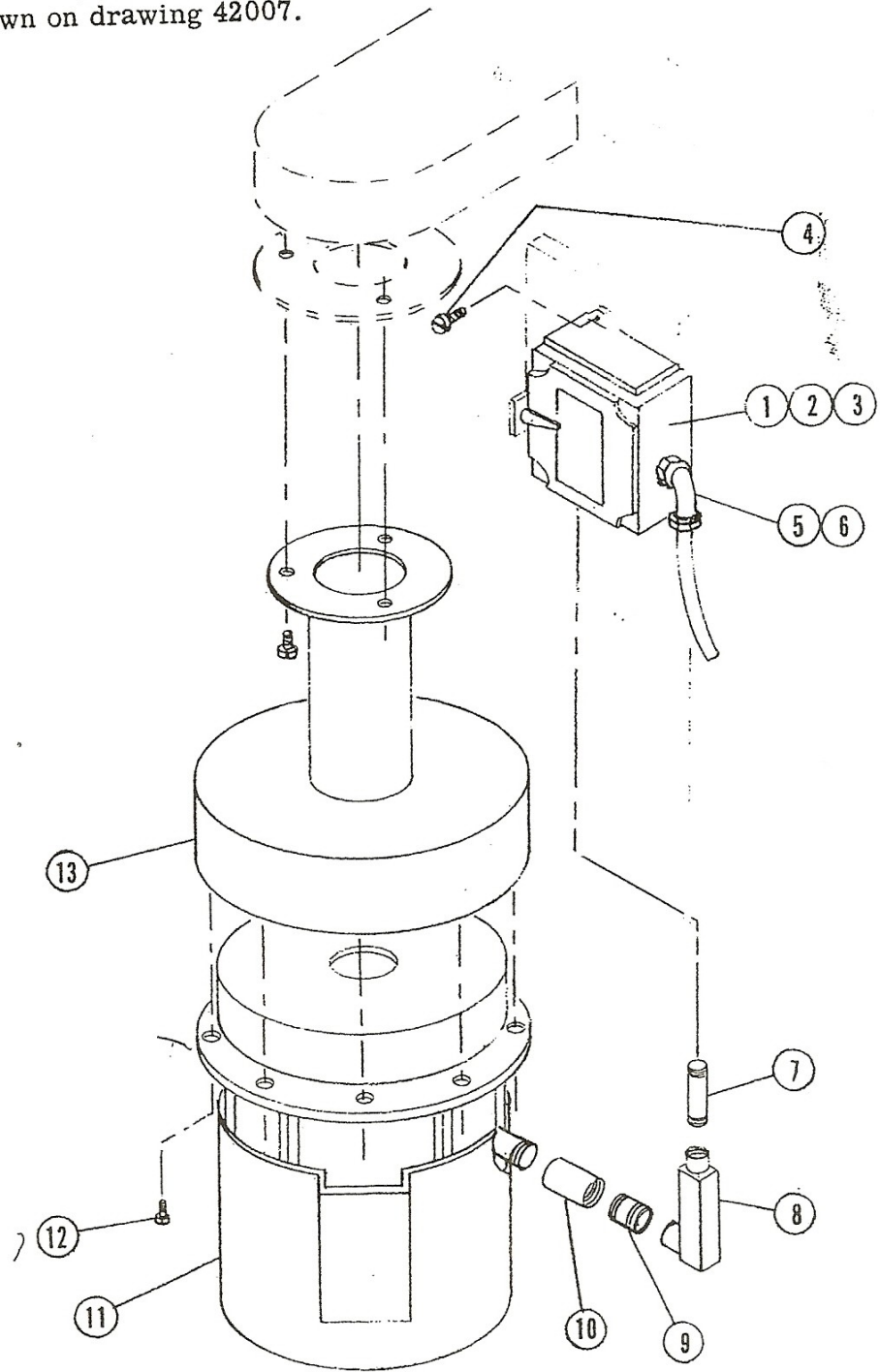
-	912002	Outside Corner Brush
-	912200	Inside Corner Brush
-	934503	Outside & Inside Brush Retainer
-	248802	Uneven Surface Blaster Assy

### External Gun Assembly



Model "SE" Exhauster Installation

NOTE: These parts are peculiar to Model SE only. All other parts are shown on drawing 42007.



Model "SX" Exhauster Installation



<u>Item No.</u>	<u>Part No.</u>	<u>Description</u>
1	42014-74	4"x4" Switch Box
2	42014-75	4"x4" Switch Box Cover (4T Weigmann)
3	903860	Capacitor
4	900605	Switch
5	900606	Heater
7	42014-80	B14-8FL Spade
8	42014-81	RB14 Splice Cap
9	42014-82	B14-10 Eyelet
10	42014-83	Cable Connector
11	42014-84	Strain Relief Conn. (2524 T & B)
12	42014-85	25', 14/3 So Rubber Cord
13	900020	Wire Twist Male Plug
14	42014-87	15" x 5/8" Sleeving
15	42014-88	16", #16 AWG Red Wire
16	42014-89	2 RB-14 Two Way Connector
17	42014-90	10", #14 AWG Black Wire
18	178164	Blower Housing (Upper)
19	918702	Elect. Hi-Static Blower
20	178165	Blower Housing (Lower)

---

Model "SE" Exhauster Installation Parts List

---

1	25300	Explosion-Proof Box & Cover
2	42015-75	B14-8 Eyelet
3	42015-83	B14-10 Eyelet
4	42015-76	1/4" x 3/4" Lg Bolt & L. W.
5	42015-77	25', 14/3 So Rubber Cord
6	42015-82	Strain Relief Conn. 90° (2270 T & B)
7	42015-80	1/2" Conduit Nipple 3" Lg
8	42015-81	Explosion-Proof LB (#XLL-1 Killark)
9	42015-78	1/2" Close Conduit Nipple
10	42015-79	1/2" Galvanized Pipe Coupling
11	918404	Explosion-Proof Motor
12	42015-87	10-24NC RD HD Screw x 5/8" Lg
13	178097	Explosion-Proof Blower Housing

Model "SX" Exhauster Installation Parts List

NOTE: All other parts for model "SE" and "SX" can be found on Deg. No. 42007