Operator's Manual

CRYSTALBLAST™

PIONEER

Vac-110 Dust Collector Not Included

IKONICS IMAGING®

An **IKONICS** Company ISO 9001 Certified NASDAQ Listed: **IKNX**

Made in USA

Engineered, manufactured and supported in the USA by MediaBlast, Inc. and IKONICS Corporation.

PLEASE READ THROUGH THIS MANUAL BEFORE OPERATION

MAXIMUM MACHINE INLET PRESSURE 125 PSI

MINIMUM LINE PRESSURE 90 PSI

For proper machine operation the above air requirements must be met

QUICK OPERATION GUIDE

The information that follows will be used to get your new CrystalBlast Pioneer machine setup and running in the shortest period of time. Use this Guide for the initial machine set-up and operation. You may refer to this Guide at any time, for more detailed operation instructions refer to the Main Operator's Manual starting on page 7.

FIRST

- To remove the machine from the pallet by first removing the screws holding the cardboard box to the wooden pallet. Lift the box off over the top of the machine, if you do not have adequate vertical height, cut the box open at one of the corners and remove.
- Remove the four 3/8" lag-bolts located at the bottom of each leg or on the cross bracing when equipped with machine casters. Some machines are shipped with strapping over the pressure pot flange for stability. This strap is under extreme tension so use caution and wear safety glasses and gloves when removing these shipping straps.

- **THIS MACHINE WEIGHS 210 POUNDS SO USE CAUTION WHEN LIFTING OFF THE PALLET AND MOVING**. MBA RECOMMENDS THE USE OF AT LEAST TWO PEOPLE WHEN REMOVING THIS MACHINE FROM THE PALLET.

- It is easier to keep the machine on the pallet to install the wheels. Move the machine to one side so one leg at a time hangs off of the pallet to allow installation of the wheels. Move machine as needed so you can get to each wheel hole mount on the bottom of each leg. Once all 4 wheels have been installed, gently lift the machine off of the pallet from one side and set two wheels on the ground and then set the other two wheels down and roll the machine into position.
- **THIS MACHINE WEIGHS 210 POUNDS SO USE CAUTION WHEN LIFTING OFF THE PALLET AND MOVING**. After the machine has been placed into position follow the steps listed below:

- Remove all items from inside the cabinet. Install the Foot Pedal Valve using the pneumatic manual diagram to locate the two tubing inlets. One is on the Pneumatic Pinch Valve and the second is on the Main Air Inlet Valve. Push the ¼" tubing into the fitting making sure the tubing is fully seated. Pull back on the tubing to check for proper installation. The Foot Pedal Valve is normally open, compressed air will flow through the valve and close the on-off Pneumatic Pinch Valve when the pot is pressurized. Pressing down on the Foot Pedal Valve will allow the Pneumatic Pinch Valve to open and blasting will occur.
- If the machine has been shipped with the optional armrest located inside the cabinet, you will need to install using the supplied fasteners. Remove the four plastic inserts to allow attachment of the armrest platform. Insert the button head screws from the outside using the washers and nuts inside the cabinet. When the metal frame is securely fastened, press the padded rest into the armrest frame.
- Open a side access door and install the light bulb at this time and make sure the inside slinger washer is installed on the bulb stem prior to installing the bulb.
- Attach the compressor air supply line to the machine at the Main Air Inlet Valve located on the right side of the air regulator-filter-water trap. At this time the Main Air Inlet Valve will be closed. This machine has been shipped without fittings to allow the customer to maintain uniformity by installing matching fittings already in use at their facility. Match the air inlet fitting to the size of the Main Air Inlet Valve or use a plumbing reducer bushing if needed. Using coiled air hoses and or multiple quick-connect fittings is not advised, this may cause compressed air flow problems that may affect proper machine operation.
- Release the power cord, 120 volt molded/grounded, and plug into any standard 120 volt 60Hz service outlet. The running amperage of this machine is 1500 watts or 14-15 amps including the vacuum dust collector assembly. A dust collector service cord has been supplied on the cabinet for connection of the vacuum dust collector. Turn the vacuum toggle on-off switch to the on position and plug the vacuum cord into the service outlet. Turning the machine on-off switch to the on position will also operate the vacuum dust collector assembly. Any dedicated available outlet will operate the machine when properly installed. The use of extension cords is not

recommended however, if you have to use an extension cord make sure the cord amperage is adequate for the machine amperage rating. All extension cords have a printed maximum amperage rating listed on the cord. Never use extension cords rated at an amperage less than 15 amps.

- Use at least a 14 gauge cord for extensions exceeding 10 feet.
- Using the machine on-off switch located on the right side of the light housing, turn the dust collector blower and lighting switch to the on position.

Make sure the air compressor is operating with a minimum line pressure of 90 psi at all times. In order for the air controls to operate correctly, you must supply adequate compressed air **volume** and **pressure**. The CrystalBlast Pioneer machine requires 30-35 psi of airline pressure above the machine blasting pressure at all times. This is required for proper operation of the machine air controls. Always close the Main Air Inlet Valve at the end of the day and drain all compressed air from the pressure pot using the Foot Pedal Valve. Always drain the pressure pot with the machine dust collector running. Running the machine dust collector will prevent abrasive from escaping the cabinet.

- Open the access door and with the vacuum dust collector running, pour 35-40 pounds of abrasive onto the operator work grate and allow the abrasive to transfer into the pressure pot assembly. The vacuum dust collector will prevent dust from exiting the machine during this process. The abrasive will fill the pressure pot because the pot plunger valve is open at this time. Any time the Main Air Inlet Valve is closed and the pot has been drained, the abrasive will drain directly into the pressure pot from the machine hopper and fill the pressure pot assembly.
- Use the front operated Pot Plunger Assembly Handle to close the Pot Plunger. While pulling back on the handle, open the Main Air Inlet Valve located on the air regulator assembly on the right side of the air regulator. Any time the pot is first pressurized, the nozzle will blast until the pot pressure exceeds the blasting pressure, this is normal. Sometimes when filling the pot with abrasive, the Pot Plunger may not seal properly, if this happens, close the Main Air Inlet Valve and push in on the handle of the Pot Plunger Assembly, pull back again on the Pot Plunger Assembly and open the Main Air Inlet Valve. If you are unable to push in on the Pot Plunger Handle the pressure pot has some pressure inside. Make sure the pot has been drained by making sure the Main Air Inlet Valve is closed and the pot is drained by standing on the blast pedal.
- Adjust the air regulator using the adjusting knob located at the top of the regulator. Normal blasting pressures range from 20-40 psi and it may become necessary to set the regulator again during the blasting process. The type and length of the air supply line used to connect the compressed air to the machine often creates a pressure drop during machine operation making a final regulator adjustment necessary. The resting or static pressure, when the blast is off, will be what is required for any blasting pressure based on machine set-up and installation materials.
- Stepping down on the Foot Pedal Valve will activate the blast. Releasing the Foot Pedal Valve will stop the blast.
- Unpack the vacuum dust collector and locate the hose assembly, attach the hose to the cabinet and vacuum dust collector, refer to vacuum manual shipped with vacuum dust collector.

NOTE:

The machine blast can be stopped at any time by releasing the Foot Pedal Valve. Closing the Main Air Inlet Valve will stop the flow of compressed air into the pressure pot assembly, you will need to keep the Foot Pedal Valve in the on position to empty the air from the pot for abrasive loading. Line pressure must be 30 psi higher than the blasting pressure at all times for proper operation of the controls.

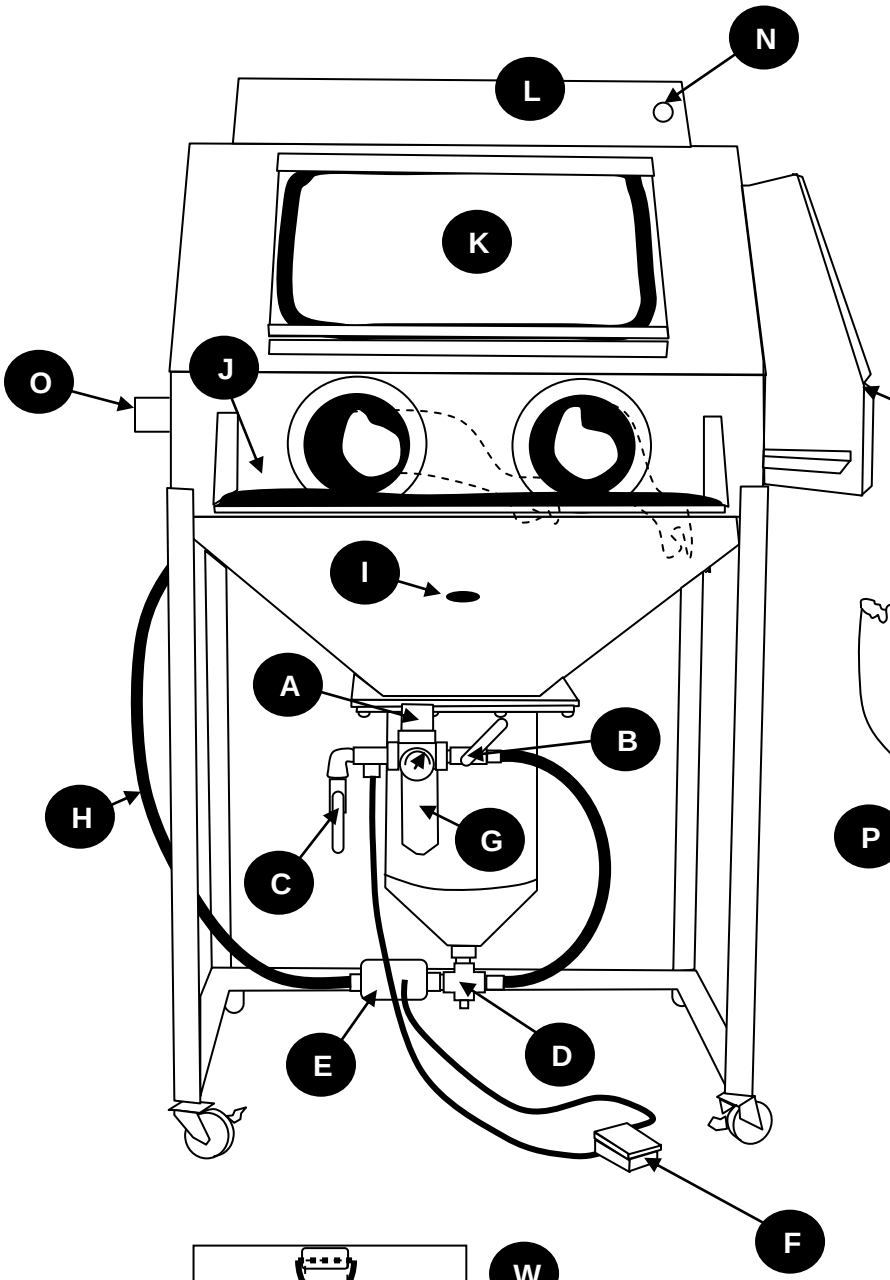
ADJUSTING THE ABRASIVE FLOW

Adjusting the abrasive flow is simple. Locate the Abrasive Choke Valve on the left side of the air regulator opposite the Main Air Inlet Valve on the right of the air regulator. Always start with the valve completely open, you will see very little abrasive exiting the nozzle. Adjust as follows but, never close the valve completely at any time.

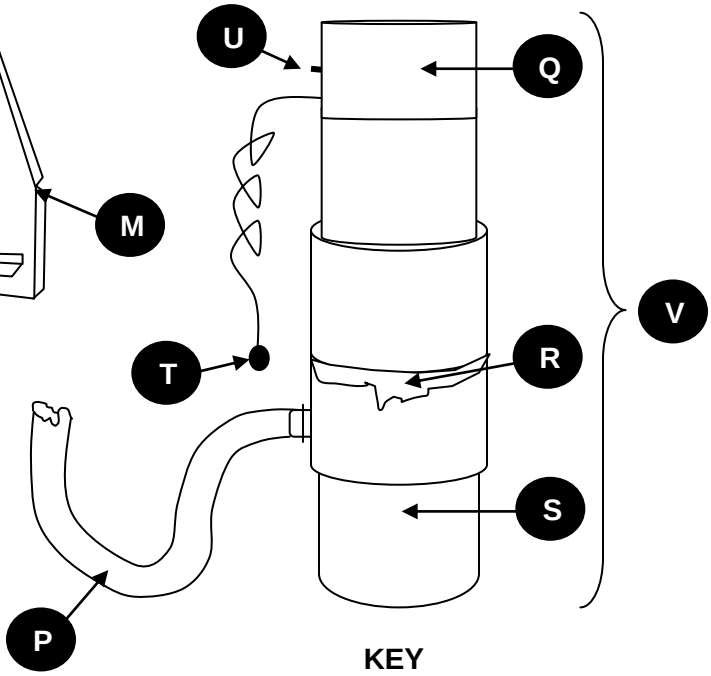
- Set the Abrasive Choke Valve at 45 degrees and test for blast by pressing down on the Foot Pedal Valve. If very little abrasive is exiting the nozzle after 2-3 seconds, close the Abrasive Choke Valve a small amount by moving the handle about 1/4"-3/8" towards closed position. If the abrasive is pulsing and delivery is excessive, open the choke valve assembly in small amounts. Just before the nozzle is delivering the proper amount of abrasive the abrasive flow will pulse slightly. Close the Abrasive Choke Valve a bit more and the pulsing will disappear, the setting is now correct. This setting will remain correct unless you change the blasting pressure or abrasive mesh size.

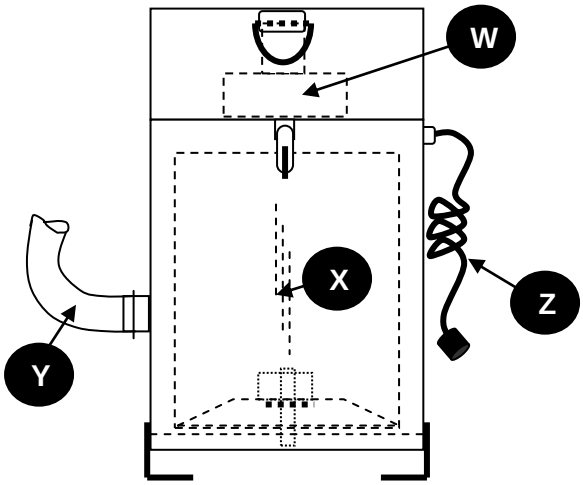
Always shut off the Main Air Inlet Valve at the end of daily operation or when the air compressor will be turned off. Depressurize the pot assembly when the air compressor is going to be turned off for the day by closing the Main Air Inlet Valve and pressing down on the Foot Pedal Valve until the air is emptied from the pot. You will hear a metallic click when the pot valve opens. Always have the machine blower running to prevent abrasive from escaping the cabinet.

OPERATION AND MAINTENANCE DIAGRAM



STANDARD DUST COLLECTOR



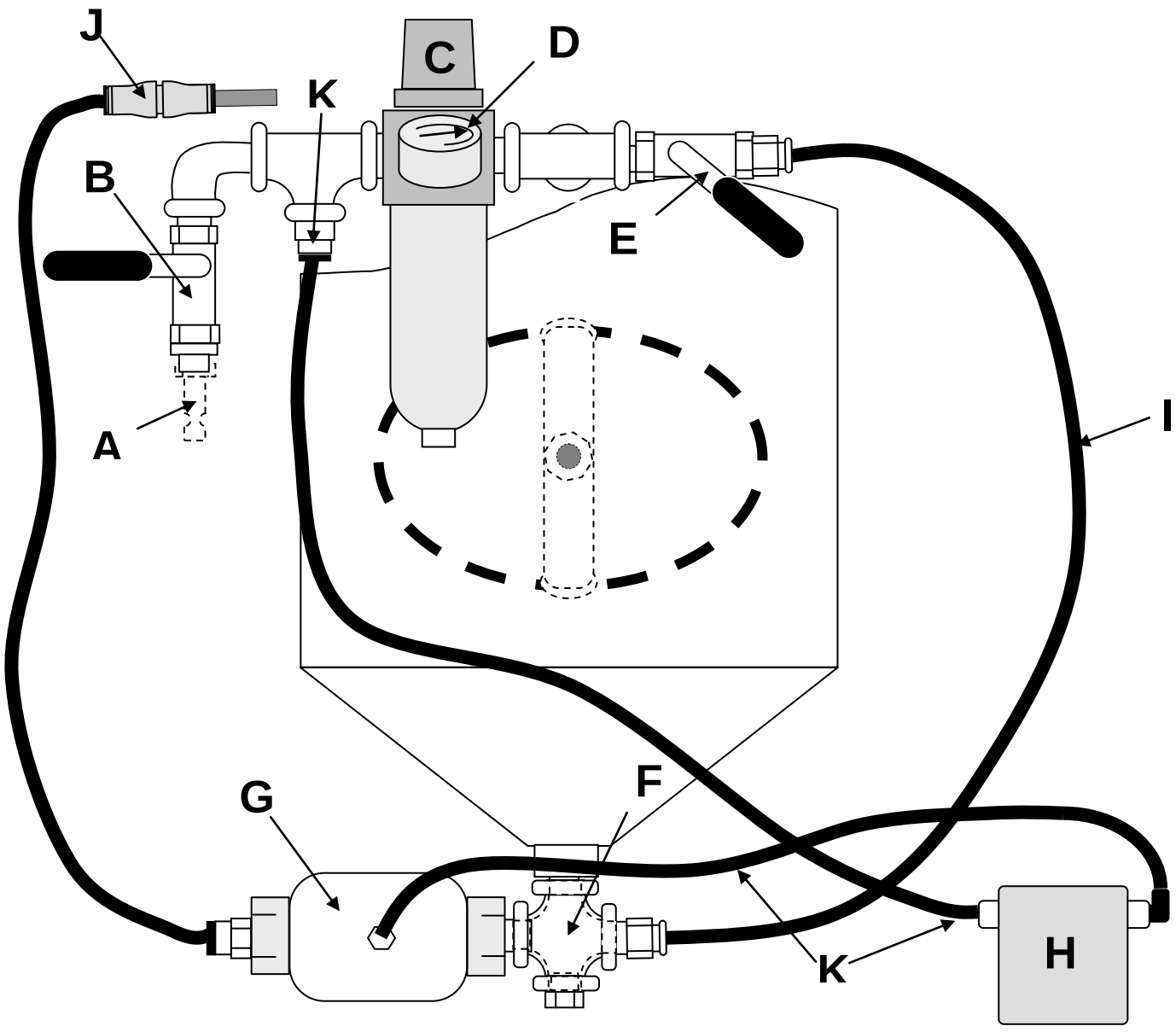


OPTIONAL VAC-110 D.C.

KEY

- **A. Air Regulator Control Knob**
- **B. Abrasive Choke Valve**
- **C. Main Air Inlet Valve**
- **D. Air/Abrasive Mixing Cross**
- **E. Pneumatic Pinch Valve**
- **F. Foot Pedal Valve**
- **G. Air/Filter Water Trap**
- **H. Abrasive Hose**
- **I. Pot Plunger Assembly Handle**
- **J. (Optional) Padded Armrest**
- **K. Full View Safety Window w/ Protector**
- **L. Light Housing**
- **M. Access Door and Handle**
- **N. Electrical On-Off Switch**
- **O. Vacuum Dust Collector Connection**
- **P. Vacuum Hose**
- **Q. Vacuum Blower**
- **R. Dust Bag**
- **S. Dust Storage Chamber**
- **T. 120 Volt Grounded Molded Cord**
- **U. On – Off Selector Switch**
- **V. Vacuum Dust Collector Complete**
- **W. Vacuum Blower**
- **X. Filter Cartridge**
- **Y. 2-1/4" Vacuum Hose**
- **Z. Power Cord**

CrystalBlast Pioneer Pneumatics Reference Diagram



KEY

A. Air Inlet Quick-Disconnect Fitting (not supplied)
B. Main Air Inlet Valve
C. Air-Regulator Control Knob
D. Air Pressure Gauge
E. Abrasive Choke Valve
F. Air/Abrasive Mixing Cross
G. Pneumatic Pinch Valve w/ micro air filter
H. Foot Pedal Valve
I. Abrasive Hose
J. Nozzle and Nozzle Holder
K. Foot Pedal Valve Tubing, ¼”

125 MAXIMUM INLET PRESSURE

IMPORTANT INFORMATION

Welcome to the CrystalBlast Family! You have just purchased the CB Pioneer sandcarving cabinet. This machine is designed, built, manufactured and assembled in the USA by Media Blast & Abrasive Inc. Established in 1977 and building fine abrasive blasting equipment for over 33 years.

This machine is very easy to operate and maintain. However, there are several important issues of which you should be aware:

- **ALWAYS USE CLEAN, DRY COMPRESSED AIR.** Moisture will cause abrasive to stick together preventing flow. Please review the compressed air requirements prior to operating this machine and install an ambient air dryer if hot air or moist air is entering the cabinet. Moisture can also affect the operation of the Vacuum Dust Collector supplied with the Pioneer Sandcarving Machine.

- **FOR PROPER OPERATION, THE STANDARD 3/32" i.d. NOZZLE REQUIRES 5.7 CFM OF COMPRESSED AIR (@ 30 psi).** Make sure that your air compressor exceeds this requirement by at least 75%, otherwise your blast pressure may not maintain the 90 psi minimum required to operate the air contorls. Premature compressor failure can be a secondary result of using a marginally sized air compressor. Operation of the optional 1/8" i.d. nozzle is not advised. The 3/32" nozzle is recommended for operation with a 9-10 cfm compressor volume measured at a tank pressure of 90 psi. Always look at cfm volume at 90-100 psi not displacement at 0 psi, actural machine cfm usage is below 6 cfm with new nozzle.

- **DO NOT BLAST ABOVE 50 PSI.** This machine is designed for operation at low pressures. Blasting at pressures in excess of 50 psi will lead to premature breakdown of the abrasive and premature failure of wear components (blast hose, blast nozzles, window protector etc.). The Pioneer model includes the Industrial Pinch Valve requiring 30 psi more line pressure than the set blasting pressure for operation of the Pneumatic Pinch Valve.

- **ALWAYS DEPRESSURIZE THE POT AT THE END OF THE DAY.** It is necessary to depressurize the pot prior to turning off the air compressor. Otherwise the nozzle will begin blasting once the line pressure drops to regulator blasting pressure plus 30 psi. Also the next time the air compressor is turned on, the system will immediately begin blasting until the air compressor builds up adaquate air pressure for proper air controls operation.

- **REGULARLY CHECK THE BORE OF THE NOZZLE.** It is important to replace the nozzle after it has worn 1/32". Not only will the worn nozzle use more compressed air but the abrasive will impact the part more aggressively and increase the potential for damaging the masking material. As the volume of air and abrasive increases it will create additional wear on the blast hose. Always depressurize the pressure pot during any machine maintenance.

- **A CLEAN DUST COLLECTOR WILL KEEP THE CABINET VISIBILITY CLEAR.** Cleaning the dust collector is key to maintaining optimum cabinet visibility. Follow the Manufacture's recommended practice for cleaning the vacuum dust collector, manual shipped with the dust collector. Empty the dust storage hopper on an established schedule based on machine usage, see instructions included with the vacuum dust collector.

- **USE MBA REPLACEMENT COMPONENTS.** Replacement of worn components with non MBA parts will void the machine warranty. The components used by Media Blast are of the highest quality and will provide the longest serviceable life.

- **REVIEW THE TROUBLESHOOTING GUIDE AND FOLLOW THE INSTRUCTIONS PRIOR TO CALLING MBA FOR TROUBLESHOOTING ASSISTANCE.** Most problems associated with the machine can be identified by simply consulting the Troubleshooting Guide. However, if your problem cannot be found in the Troubleshooting Guide, please give us a call. Nearly all equipment malfunction issues can be resolved over the telephone.

GETTING STARTED

UNIT PLACEMENT: Allow adequate clearance for loading and unloading the blast cabinet. MBA recommends 36" in front of the cabinet for the operator and 36"on the door sides of the cabinet. The Pioneer model includes one side access door. Always leave adequate room for installation and service of the side mounted vacuum dust collector. If more room is required when servicing the dust collector the machine is equipped with casters allowing easy movement for service. Never place the unit where direct light can strike the operator view window. This will cause reflections on the view window and make it uncomfortable and difficult for the operator to view the work in progress.

INSTALLATION OF FOOT PEDAL VALVE: Place the Foot Pedal Valve on the floor in front of the cabinet with the ¼" tubing pointing to rear of the cabinet. Push one ¼" tube into the tube fitting on the Pneumatic Pinch Valve, this valve stops the abrasive flow. (**Item G** - Pneumatics Reference Diagram). The Pneumatic Pinch Valve is equipped with a Micro Filter fitting for the installation of the Foot Pedal Valve 2nd ¼" tubing. The Micro Filter is used to prevent abrasive from flowing back into the Foot Pedal Valve assembly if the Pneumatic Pinch Valve bladder replacement is required. Push the second tube into the tube fitting located between the air regulator and Main Air Inlet Valve (**Item K** - Pneumatics Reference Diagram).

ELECTRICAL REQUIREMENTS AND CONNECTION: All CrystalBlast sandcarving cabinets are wired standard for 120V / single phase service. MBA recommends that this cabinet be installed on a dedicated 20-amp breaker similar to any large single power-consuming appliance. Open the vacuum dust collector shipping box and remove the collector making sure to connect the power cord of the collector to the service outlet of the machine. Turn the vacuum collector switch to the on position. Turning the machine on will turn on the vacuum collector.

125 MAXIMUM INLET PRESSURE

AIR REQUIREMENTS AND CONNECTION: The standard 3/32" i.d. nozzle requires 5.7 cfm @ 30 psi. The optional 1/8" i.d. nozzle is not advised with any vacuum dust collector operated model. Note: cfm – volume of compressed air in cubic feet per minute, psi – pressure of air in pounds per square inch. Stopping the blast during machine operation will save on compressed air (e.g., blasting 50 seconds of every minute will decrease the compressed air requirements by 16%. Make sure that your air compressor exceeds this requirement by at least 75% (9-10 cfm for the 3/32" nozzle. Premature compressor failure can be a secondary result of using a marginally sized air compressor. Note: The system must provide at least 30 psi more line pressure to the cabinet than the actual blasting pressure. MBA recommends a two-stage air compressor but any air compressor capable of 9-10 cfm at 90-100 psi will be adequate for proper machine operation using the 3/32" nozzle. When using a two stage air compressor set the maximum line inlet pressure at no more than 125 psi and no less than 90 psi. This may require installation of a master compressor air regulator, if unclear call factory for more information.

It is very important that the compressed air be clean and dry. Wet compressed air will cause the abrasive to bond together and stop flowing. Under sizing the air compressor, will create a situation that will not allow adequate time for the compressed air to cool in the air receiver tank. This warm compressed air enters the blast cabinet and immediately cools as the pressure drops. The resulting condensation will cause the abrasive to stick together. If wet compressed air is suspected, install an air dryer prior to the air entering the blast cabinet (MBA Ambient Air Dryer, P/N 100-03-173). Note: As the blast nozzle wears, the air requirements for the system will increase. If the air compressor is not capable of handling the higher air volumes, the blast pressure will begin to decrease and loss of line pressure, will lead to poor machine performance.

The minimum air hose size must be at least 3/8" ID. Using smaller ID hose may affect proper machine controls operation. Connect main air in to the machine (**Item B** - Pneumatics Reference Diagram) using quick disconnect sleeve couplers. The Pioneer model includes a Main Air Inlet Valve to control air On/Off. This valve is used to pressurize the pressure pot assembly and depressurize the pot when filling with abrasive.

CONNECT THE VACUUM HOSE TO THE MACHINE: Shipped with the vacuum dust collector is one vacuum collector hose. Normally this hose is packed in the bottom dust collector chamber, see shipping instructions with vacuum collector. Attach one end to the cabinet separator reclaimer fitting located on the left side of the machine. The other end connects to the inlet of the vacuum dust collector. Make sure the vacuum is plugged into the service outlet of the machine and make sure the vacuum switch is in the on position.

SELECTING THE RIGHT ABRASIVE: There are three different basic types of abrasives that can be effectively used for etching and carving on glass; brown aluminum oxide, white aluminum oxide and black silicon carbide. Each type has beneficial qualities:

- ***Brown Aluminum Oxide*** – Some manufacturers recommend and sell this abrasive. This abrasive is more forgiving than silicon carbide because it is not as aggressive. It normally has more dust than silicon carbide and it cuts glass slower than silicon carbide. For industrial applications, it is the most commonly used abrasive for surface preparation for coatings. However, the productivity of aluminum oxide is significantly slower than silicon carbide and as the abrasive is used, the abrasive particles become more rounded which continues to reduce the effectiveness of the etch. Aluminum oxide is a good abrasive to use when sandcarving for the first time.
- ***White Aluminum Oxide*** - White aluminum oxide differs from brown aluminum oxide because it has no iron content. This means that the abrasive will not leave a stain on the part that is blasted. Since the abrasive is screened to tighter specifications, it may be less dusty than brown aluminum oxide. Both white and brown aluminum oxides are more forgiving on the mask material. MBA recommends that aluminum oxide be used by beginners and less experienced operators.
- ***Silicon Carbide*** - This abrasive is not recommended for beginning sandcarvers. Silicon carbide is very aggressive and sharper than aluminum oxide and recommended for skilled sandcarvers. The aggressiveness can be beneficial; carving and etching can be accomplished much faster with the silicon carbide. In addition, the silicon carbide never loses its sharp edge.

Qualities and recommendations aside, the choice for blasting abrasive is personal. Some people will prefer the white aluminum oxide, while others will prefer the brown aluminum oxide or the silicon carbide. The typical size ranges used are 120 and 180 mesh. The finer sizes (150 mesh is larger than 180 mesh) provide a smoother finish on the blasted surfaces. Note: The use of silica sand, garnet, slag, Starblast™ or other non-recyclable abrasives in the system will void the Crystalblast Pioneer equipment warranty. Sand contains free silica known to cause Siliceous. The Pioneer model includes a vacuum abrasive separator reclaimer used to clean the abrasive and prevent the vacuum from transferring the good abrasive into the dust collector.

LOADING THE SYSTEM WITH ABRASIVE: Turn on the power to the machine (**Item N** – Operation & Maintenance Diagram). The abrasive of choice should be loaded through the cabinet door with the dust collector blower running. The Pioneer model requires an initial charge of 30-40 pounds of abrasive. Note: Never add abrasive to the system unless the dust collector is running, this will lesson and control fine dust contained in the abrasive.

There is no need to pre-screen the abrasive. The CrystalBlast Pioneer system includes a perforated scalper screen designed to remove all particles large enough to clog the nozzle. Additional abrasive can be added from time to time to maintain maximum levels in the system. Shorter blast intervals between pot reload is a good indication that more abrasive needs to be added to the system. (EXAMPLE: The 3/32” blast nozzle consumes approximately 1.1 pounds per minute of abrasive for an approximate total blast duration of 25-30 minutes with a full abrasive charge in the blast pot and a new nozzle ID size. If the total blast time to empty the pot falls to 15 minutes, add 10 pounds of abrasive to the system to bring the system up to a full charge.) Note: Some abrasive will remain inside the cabinet and void abrasive use due to ledge stacking. This is normal; the addition of more abrasive will compensate for this stacking but it is not required.

FILLING THE BLAST POT: Loading the system with abrasive will also fill the blast pot at the same time. With the pot de-pressurized the Pot Plunger will be open allowing the abrasive to drain through the perforated screen directly into the pot assembly. This occurs because the Main Air Inlet Valve, (**Item B** - Pneumatics Reference Diagram) is closed. To pressurize the pot for the first time or after filling the pot, pull out on the Pot Plunger Assembly Handle (**Item I** – Operation & Maintenance Diagram) located on the front center of the blast cabinet hopper. This applies pressure on the Pot Plunger against the pot valve rubber seal seat, to seal the pot. While pulling back on the Pot Plunger Assembly Handle, open the Main Air Inlet Valve, (**B** – Pneumatics Reverence Diagram), this will pressurize the pot. If any audible air leakage is noted after 2 seconds, depressurize the pot by closing the Main Air Inlet Valve and pushing down on the Foot Pedal Valve, then pull out again on the Pot Plunger Assembly Handle while opening the Main Air Inlet Valve. Note: The air compressor receiver tank must have a pressure of 80-90 psi prior to pressurizing the blast pot. The nozzle will blast during pot pressurization for 1-2 seconds, this is normal and when the pressure in the Pneumatic Pinch Valve exceeds the blasting pressure, the Pneumatic Pinch Valve will stop the blast nozzle.

ADJUSTING THE BLAST PRESSURE: The blast pressure is adjusted using the pressure regulator (**Item C** – Pneumatics Reference Diagram) located on the front of the pressure pot assembly. Rotating the pressure regulator adjustment knob clockwise will increase the blast pressure. Rotating the pressure regulator adjustment knob counter-

clockwise will reduce the blast pressure. Typical blast pressures for etching and carving on glass are 20 – 40 psi with 30 psi suggested. Note: This machine should not be operated at pressures greater than 50 psi.

ADJUSTING THE ABRASIVE FLOW: The abrasive flow is adjusted using the Abrasive Choke Valve (**Item E** – Pneumatics Reference Diagram). The Abrasive Choke Valve is located on the left side of the air regulator opposite the Main Air Inlet Valve. When the Abrasive Choke Valve is completely open, you will see very little abrasive exiting the nozzle. Adjust as follows but, never close the Abrasive Choke Valve completely:

You can start with the Abrasive Choke Valve completely open or set the Abrasive Choke Valve at 45 degrees and test the blast pattern by pressing on the Foot Pedal Valve assembly. If very little abrasive is exiting the nozzle after 2-3 seconds, close the Abrasive Choke Valve a small amount by moving the handle about 1/4"-3/8" towards closed position. Just before the nozzle is delivering the proper amount of abrasive, the abrasive flow will pulse slightly. Close the Abrasive Choke Valve a bit more and the pulsing will disappear, the setting is now correct. This setting will stay correct unless you change the blasting pressure or abrasive mesh size.

Always shut off the Main Air Inlet Valve at the end of daily operation or when the air compressor will be turned off. Depressurize the pot assembly when the air compressor is going to be turned off for the day by closing the Main Air Inlet Valve and pressing down on the Foot Pedal Valve until the pressure pot is empty. Remember to have the machine blower running to prevent abrasive escape.

WEARING GLOVES: The CrystalBlast Pioneer sandcarving cabinet is equipped with attached gloves. This is required on all models that include a vacuum dust collector assembly. MBA recommends that any machine using a lower cfm vacuum dust collector always be equipped with attached gloves.

READY TO BLAST: The unit is now ready for blasting. Turn on the electrical on-off switch (**Item N**– Operation & Maintenance Diagram). Place a piece of scrap glass in the machine to test the blast. Using a pair of disposable gloves, place both arms in the arm ports and pick up the scrap glass for the test. Rest your elbows on the padded arm rest and hold the nozzle/nozzle holder like a pencil about 3-4 inches from the part surface. Depress the Foot Pedal Valve and begin blasting the scrap part and always remember to start the blasting, off of the part surface. *Note: Never point the nozzle at the window. The abrasive will permanently frost the protector window.*

Note: The MBA CrystalBlast Pioneer system may provide different results than other blast systems. When the unit is first operated, use scrap glass to become familiar with the nozzle pattern and speed. Place masking material on the scrap glass to see how long the mask material will stand up to the blast. The experienced operator may find that the CrystalBlast Pioneer system will be operated at lower blast pressures than previously experienced with other systems.

FINISHING BLAST: At the end of the day, when the blasting is finished or when the air compressor is turned off the blast pot must be depressurized. Close the Main Air Inlet Valve, (Item B Pneumatics Reference Diagram) and use the Foot Pedal Valve to drain the pressure pot. **Make sure the dust collector blower is running**. It is recommended that you clean the vacuum dust collector at the end of each day.

PRESSURE BLAST CFM CONSUMPTION

Nozzle Size		CFM CONSUMPTION AT SPECIFIC PRESSURES								
		20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI
1/16”	0.062	2.00	2.50	3.10	3.70	4.20	4.80	5.40	5.90	6.50
3/32”	0.094	4.40	5.70	7.00	8.20	9.50	10.80	12.10	13.30	14.60
1/8” (#2)	0.125	7.90	8.38	10.29	12.20	14.02	15.93	17.76	19.67	21.80
3/16” (#3)	0.187	15.00	18.92	23.24	27.39	31.54	35.85	40.08	44.15	49.00
1/4" (#4)	0.250	26.00	33.62	41.17	48.64	56.11	63.66	71.13	78.68	85.00
5/16” (#5)	0.312	42.00	54.61	67.06	79.10	91.13	103.63	115.66	127.74	140.00
3/8” (#6)	0.375	58.00	75.61	92.96	109.56	126.16	143.59	160.19	176.79	194.00
7/16” (#7)	0.437	83.00	105.03	128.65	152.31	175.55	199.20	222.44	245.68	268.00
1/2" (#8)	0.500	105.00	143.46	164.34	195.05	224.93	254.81	284.69	314.57	346.00

MAINTENANCE:

GENERAL EQUIPMENT MAINTENANCE (Intervals May Vary Depending on Equipment Usage)	DAILY	Weekly	MONTHLY	SEMI-ANNUALLY	ANNUALLY
DRAIN REGULATOR WATER TRAP	X				
CLEAN THE DUST COLLECTOR FILTER BAG	X				
CLEAN THE ABRASIVE SCALPER SCREEN		X			
REMOVE DUST FROM DUST COLLECTOR	X				
INSPECT THE BLAST NOZZLE	X				
INSPECT THE BLAST HOSE		X			
REPLACE THE AIR INLET FILTERS				X	
REPLACE THE FILTER BAG					X

CLEANING THE ABRASIVE SCALPER SCREEN: Lift up the expanded metal work grate and remove the grate from the cabinet. You can use the vacuum dust collector to clean the debris off the scalper screen by removing the vacuum hose from the cabinet. Replace the operator work grate and the vacuum hose when finished.

CLEANING THE DUST COLLECTOR FILTER: The dust collector filter should be cleaned daily, refer to Manufacture's guidelines that were shipped with vacuum dust collector model. A clean filter means a clean machine and work area so this operation is critical to the operation of any blasting cabinet. The dust bag located inside the unit will move when the machine is turned on and off. This will help to clean the dust bag but it may become necessary to remove the top chamber and shake the bag assembly. This will release collected dust and drop the dust into the lower dust storage chamber. Never remove and wash the dust bag, this will shrink the filter material and change the filter properties.

REMOVING THE DUST FROM THE DUST COLLECTOR: Periodically the dust must be removed from the dust collector lower chamber. MBA recommends you follow the manufacture's guidelines included with the vacuum dust collector. The Pioneer is equipped with a vacuum separator reclaimer and all the material found inside the dust collector will be spent and it should never be placed back inside the cabinet.

CLEANING THE OPTIONAL VAC-110 DUST COLLECTOR CARTRIDGE FILTER: The optional VAC-110 dust collector cartridge filter should be cleaned at least once per week. Note: Cleaning the filter prior to operating the machine at the beginning of the day is advisable but not required. Oftentimes, compressed air has small traces of moisture present (especially if the compressor is operated without an air dryer). Allowing the filter to dry overnight will provide more effective cleaning of the filter. Clean customer supplied shop vacuum dust collectors according to maintenance schedules and procedures recommended by factory. Cleaning the filter is listed in the Removing the Dust for the Dust Collector below.

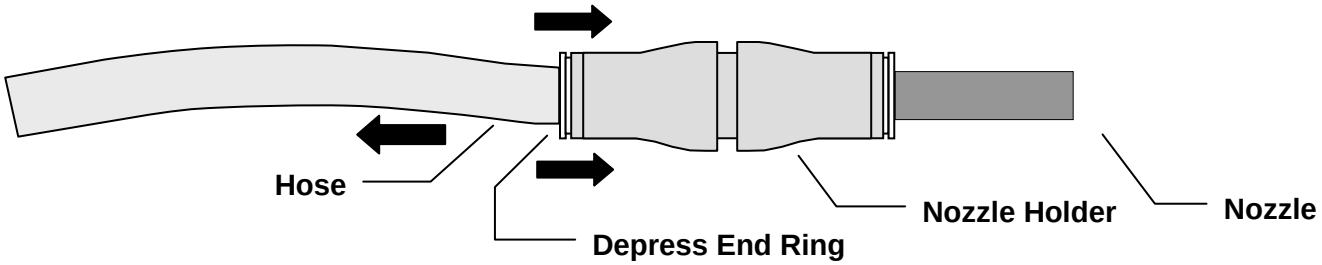
REMOVING THE DUST FROM THE OPTIONAL VAC-110 DUST COLLECTOR: Periodically, the dust must be removed from any dust collector chamber and filter cartridge. MBA recommends removing the filter cartridge at least once per week (more often depending on the type of abrasive used, the blasting pressures and the number of cabinet process hours per week). Prior to removing the filter cartridge, make sure you have a trash bag available.

If equipped with the VAC-110 dust collector, unplug the vacuum collector power cord from the service outlet. Unfasten the two blower housing latches and set housing aside. Reach inside the filter cartridge and unscrew the tightening knob that holds the filter inside the unit. Remove the knob and seal and set aside. Lift the filter cartridge from the housing taking care not to damage the cartridge. Place the cartridge inside a standard trash bag and seal the bag tight. Slap the bottom of the steel cartridge cap to loosen the attached dust. After loosening most of the dust, remove the filter from the bag and install inside the collector housing or further clean using any industrial vacuum. Take care to make sure the tightening seal is installed. Tighten the holding knob taking care not to over tighten

Replace the blower housing and reinstall power service. The filter cartridge can be repaired using 100% silicon sealing calk. Clean the damaged area and seal with silicone. Make sure the seal is allowed to cure for 24 hours or caulk direction for cure.

INSPECTING AND REPLACING THE BLAST NOZZLE: It is important to replace the nozzle after it has worn 1/32". Not only will the worn nozzle use more compressed air, but the abrasive will impact the part more aggressively. As the volume of air and abrasive increases, it will create additional wear on the blast hose too. The easiest way to know if your nozzle requires replacement is to keep a 1/8" drill bit nearby. If the drill bit fits into the blast nozzle, then it is time to replace the nozzle. Replacement is not manditory but, a worn nozzle uses more compressed air and if the air compressor is margional, the machine controls will not operate properly unless 90 psi line pressure is maintained. The Pioneer also includes a vacuum dust collector that has a 100 cfm blower, operation using a 1/8" nozzle is not advised.

Always depressurize the pressure pot during any machine maintenance; To replace the blast nozzle, hold the nozzle and nozzle holder (**Item J** – Pneumatics Reference Diagram) in your right hand and the blast hose (**Item I** – Pneumatics Reference Diagram) in your left hand. With your right thumb and forefinger, press the end ring of the nozzle holder toward the nozzle (see diagram below). As you are pressing, pull the abrasive blast hose the other direction using a twisting motion. The hose should release from the nozzle holder. Note: **Do not try to remove the nozzle from the nozzle holder.** The nozzle holder is designed to be an integral part of the nozzle. Removal and reinstallation of the nozzle in the nozzle holder may cause the nozzle to become a projectile. Injury may occur as a result. Dispose of the nozzle holder with the nozzle when the nozzle has worn out.



REPLACING THE BLAST HOSE: Always depressurize the pressure pot during any machine maintenance; To replace the blast hose, hold the nozzle and nozzle holder in your right hand and the blast hose in your left hand. With your right thumb and forefinger, press the end ring of the nozzle holder toward the nozzle (see diagram). As you are pressing, pull the abrasive blast hose the opposite direction. Remove the other end of the hose from the connector using the same process. Note: All hoses and tubing are removed using this same procedure.

Replace with new abrasive hose in reverse of above procedure.

REPLACING THE LIGHT BULB: Replace the light bulb by opening the cabinet door and unscrewing the spot light making sure the bulb has cooled. Make sure to replace the cabinet heat resistant sealing washer. New washers are available as a spare part. These washers are a special material for usage on halogen spot lighting. Never use standard washers that may pose a possible fire hazard. Never replace a hot bulb and always wear safety gloves for hand protection and glasses for eye protection.

REPLACING THE WINDOW PROTECTOR OR VIEW WINDOW: Remove the screws located on the top window bracket. Next, **only** loosen the bottom screws but do not remove the screws from the cabinet. The bottom bracket will hold the window and window protector during replacement of the protector window. Remove the operator view window, clean and set aside. Next remove the window protector glass. Replace with a clean protector glass and replace the operator view window. Install the top window bracket and hand tighten the fasteners. Tighten the bottom and top fasteners in a circular motion making sure not to over-tighten the fasteners.

REPLACING THE VACUUM DUST COLLECTOR FILTER: Prior to replacing the filter clean the bag using the procedure listed in the vacuum collector operating manual. Make sure the power is turned off. Remove the top chamber first. (Refer to REMOVING THE DUST FROM THE DUST COLLECTOR procedure).

Cover the bottom chamber top with an appropriate plastic waste trash bag. Hold the bag in place and turn the container upside down. Keeping the bag over the outlet will prevent dust from escaping. Allow the dust to settle before removing the bag. Tie up the waste bag and dispose of using standard practice.

Re-assemble the vacuum dust collector according to manufacture's instructions shipped with the machine.

REPLACING THE BLAST SHUT-OFF VALVE SLEEVE:

- Turn Off Machine Air & depressurize pot assembly.
- It is advisable to drain existing abrasive from the blast pot prior to pinch valve removal and/or service. Remove all abrasive using the pressure pot access port described in the machine maintenance manual, "Changing Abrasive".
- Locate the Pinch Valve attached to the bottom of the pressure pot assembly. Detach the abrasive hose from the pinch valve by depressing the white quick release ring and pulling on the abrasive hose. Next, use a crescent and engage the pinch valve bladder end cap closest to the pressure pot. Loosen the pinch from this end cap, be careful not to damage the pinch valve. Removing the Pinch Valve from the machine is recommended for maintenance.

- Remove both end caps with a large set of channel locks or crescent wrench. The caps are plastic and can easily be damaged, take care when removing.
- With end caps removed use a blunt object approximately 1" in diameter i.e. a broomstick or anything that will not damage the plastic valve body. Use this to push the Pinch Valve Bladder through the body and out the other side.
- Remove any debris from the Valve Body and from the new Bladder. Insert the new Pinch Valve Bladder by squeezing one end of the Bladder and working it into the Valve Body. Push the Bladder through until it is seated flush on both ends.
- Replace End caps. Do not over tighten. Plastic threads can be damaged.
- Re-install the Pinch Valve on the machine making sure no abrasive grains exist on the valve or pot nipple assembly.

- Replace the pressure pot access port making sure the pot seal is located properly. You may now charge the machine with abrasive.
- Restore Machine Air

Pinch Valve Part #'s
109-20-200, Standard

Bladder Part #'s
109-20-201, Standard

DRAINING THE BLAST POT AND REPLACING WITH NEW ABRASIVE: In general, as the abrasive breaks down, the dust will be carried to the dust collector. Small particles of abrasive will remain in the recyclable abrasive mix until it is too fine to be retained by the abrasive reclaim separator. This may or may not cause a noticeable difference in the blast productivity or etch finish. Oftentimes, it will not be noticeable because additional abrasive is added from time to time to make up for the abrasive that has been broken down. If a noticeable difference in the blast productivity or etch finish occurs, the abrasive may need to be replaced in the system. MBA recommends the following procedure for changing the abrasive:

1. Make sure that the lights and exhaust blower are running on the machine.
2. Depressurize the blast pot by closing the Main Air Inlet Valve and draining the pressure pot.
3. Push on the Pot Plunger Assembly Handle to make sure there is no pot pressure, if the plunger opens, the pot is empty.
4. Place a pan underneath the blast pot.
5. Remove the drain plug located on the Air/Abrasive Mixing Cross fitting (**Item F** – Pneumatics Reference Diagram) beneath the blast pot. The abrasive will begin draining into the pan.
6. Remove the expanded metal work grate from the cabinet.
7. Using a wide putty knife, move all the abrasive from the hopper corners and the ledges to the perforated scalper screen, the abrasive will drain into the blast pot. Note: To ensure that no residual abrasive is left in the blast pot, the blast pot can be tapped with a rubber mallet to dislodge any trapped abrasive. To ensure nearly complete evacuation of abrasive, remove the pot cleanout port on the rear of the blast pot and use a shop vacuum to clean any residual abrasive out of the blast pot.
8. Removal of the pot may be necessary if the nesting has occurred at the bottom of the pot assembly.
9. Replace and tighten the plug in the Air/Abrasive Mixing Cross fitting.
10. Replace the cleanout port cover, if removed, make sure the gasket is seated correctly.
11. Install the port cover crab bracket and tighten.
12. Replace the expanded metal workgrate.
13. Add 30 pounds of new abrasive to the system. Note: If it is critical to remove all the abrasive, remove the access cover on the rear of the blast pot. To do this, remove the nut that holds the crab bracket in place. Once the nut and crab have been removed, the blast pot access cover can be manipulated out of the blast pot by turning 180 degrees. Use a shop vacuum to clean the rest of the abrasive out of the blast pot. When replacing the blast pot access cover, make sure that the rubber gasket and access cover are uniformly aligned across the access hole.

REPLACING THE POT SEAL OR THE POT PLUNGER: This maintenance procedure will unlikely need to be performed for many years however, eventually the blast pot seal will wear out requiring replacement.

1. Turn the machine on.
2. Turn off the Main Air Inlet Valve and depressurize the blast pot using the Foot Pedal Valve.
3. Place a pan under the blast pot to catch any abrasive that comes out of the blast pot.
4. Remove the expanded metal work grate from the cabinet.
5. Locate the clevis attached to the vertical rod that is attached to the Pot Plunger. Remove the cotter pin from the clevis pin.
6. Pull the clevis pin to disconnect the assembly from the Pot Plunger rod/clevis.
7. Unthread the clevis from the rod; the Pot Plunger should drop down inside the blast pot.
8. Remove the access cover on the rear of the blast pot by removing the nut that holds the crab bracket in place. Once the nut and crab have been removed, the blast pot access cover can be manipulated out of the blast pot.
9. Unthread the pipe riser inside the pot that guides the Pot Plunger up and down, do not over tighten this nipple when replacing.
10. Remove the pipe riser and Pot Plunger at the same time.
11. Locate the donut shaped pot seal on the abrasive inlet to the blast pot.
12. Wedge a small screwdriver between the metal lip of the blast pot and the blast pot seal. Pry the blast pot seal out of the blast pot, note location of the seal bevel.
13. Install the new blast pot seal, make sure the bevel is located at the bottom.
14. Replace the Pot Plunger and pipe riser together as a single assembly. The parts must be assembled together before putting inside the blast pot and the pipe riser threaded into place. Install the Pot Plunger with care; make sure the clevis rod passes through the hole in the scalper screen. Use caution and make sure to install the polyethylene seal washer on the clevis rod.
15. Reinstall the access cover on the rear of the blast pot. When replacing the blast pot access cover, make sure that the rubber gasket and access cover are uniformly aligned across the access hole. Tighten the nut that holds the access cover in place.
16. Thread the clevis back onto the Pot Plunger rod and tighten.
17. Attach the assembly to the clevis with the clevis pin.
18. Reattach the cotter pin to the clevis pin.
19. Check the operation of the Pot Plunger Assembly by pushing and pulling the handle several times.
20. Re-pressurize and depressurize the blast pot several times. Be sure to pull slightly on the handle each time the pot is pressurized and push the handle to drop the Pot Plunger each time the pot is depressurized.
21. Reinstall the expanded metal workgrate.

TROUBLESHOOTING:

WILL NOT BLAST: COMPRESSED AIR (BUT NO ABRASIVE)	**BLAST NOZZLE IS PLUGGED:** *Remove the nozzle/nozzle holder from the blast hose. Use a small, stiff wire to dislodge the obstruction.* **BLAST POT IS EMPTY:** *Depressurize the blast pot using the Main Air Inlet Valve and Pot Plunger Assembly Handle, see procedure* **NO ABRASIVE IN THE CABINET:** *Add 30 pounds of abrasive to the system. Be sure that the dust collector is on when the cabinet is loaded with abrasive.* **ABRASIVE CHOKE VALVE IS NOT ADJUSTED CORRECTLY:** *Rotate Abrasive Choke Valve arm to approximately 45° and test for abrasive flow. Refer to the "Adjusting the Abrasive Flow" section of the manual for adjustment procedures if the flow is not quite correct.* **ABRASIVE IS DAMP***: Wet abrasive sticks together. Clean the abrasive out of the machine and replace with fresh abrasive. Determine cause of moisture and repair problem to prevent reoccurrence. Check the filter trap on the air regulator; drain if there is water in it. Install MBA Inline Ambient Air Dryer (P/N 100-03-173) to prevent reoccurrence.*
WILL NOT BLAST: NO COMPRESSED AIR OR ABRASIVE	**CHECK REGULATOR:** *Is it turned off?* **COMPRESSED AIR IS TURNED OFF OR DISCONNECTED FROM BLAST CABINET:** *Make certain that the compressed air is connected to the blast cabinet and turned on.* **BLAST POT IS DEPRESSURIZED:** *Pressurize blast pot by pulling back on the pot loading handle and rotating the Main Air Inlet Valve handle (Located on the right side of the air regulator) to the horizontal position.* **BLAST NOZZLE IS PLUGGED:** *Remove nozzle and use a small, stiff wire to dislodge the obstruction.* **ABRASIVE CHOKE VALVE COMPLETELY CLOSED:** *If the Abrasive Choke Valve is completely closed (Abrasive Choke Valve arm in the vertical position), then the abrasive hose is probably plugged with abrasive. Refer to abrasive hose unplugging procedure in the "Adjusting the Abrasive Flow" section of the manual.*
"V" BLAST PATTERN FROM NOZZLE	**SMALL PIECE OF DEBRIS LODGED IN NOZZLE:** *Remove the nozzle/nozzle holder from the blast hose. Use a small, stiff wire to dislodge the obstruction.*

BLAST WILL NOT STOP	**PNEUMATIC PINCH VALVE SLEEVE HAS A HOLE:** *Immediately decompress the blast pot. Turn off main supply of air to the blast cabinet. Refer to the "Replacement of the Pneumatic Pinch Valve Sleeve" section in the manual for repair procedure.* **BLAST NOZZLE IS WORN OUT:** *Air compressor cannot keep up with the air volume necessary to operate the larger blast orifice, so the compressor line pressure drops below 80 psi. Immediately decompress the blast pot. Replace nozzle.* **DEBRIS IN THE PNEUMATIC PINCH VALVE:** *Immediately decompress the blast pot. Remove the Pneumatic Pinch Valve from the machine. Remove both hex nut covers. Clean out the valve. Inspect the sleeve for holes. Reassemble and reinstall.* **BLAST POT WAS NOT DEPRESSURIZED AND COMPRESSOR WAS TURNED OFF:** *Depressurize blast pot.* **AIR COMPRESSOR DOES NOT CYCLE ON UNTIL PRESSURE DROPS BELOW 80 PSI:** *Replace air compressor or change control on compressor.* **AIR COMPRESSOR IS TOO SMALL:** *Air compressor does not generate enough volume of air to maintain a line pressure of 80 psi or more.*
ERRATIC ABRASIVE DELIVERY FROM NOZZLE	**NOZZLE IS WORN OUT:** *Replace nozzle.* **ABRASIVE FLOW VALVE IS NOT ADJUSTED CORRECTLY:** *Erratic abrasive delivery is usually caused by too rich abrasive flow. Rotate Abrasive Choke Valve arm in small increments towards a horizontal position. Refer to the "Adjusting the Abrasive Flow" section of the manual for adjustment procedures if the flow is not quite correct.* **ABRASIVE IS DAMP***: Wet abrasive sticks together. Clean the abrasive out of the machine and replace with fresh abrasive. Determine cause of moisture and repair problem to prevent reoccurrence. Install MBA Inline Ambient Air Dryer (P/N 100-03-173) to prevent reoccurrence.* **ABRASIVE IS WORN OUT:** *Replace the abrasive. Refer to the "Draining the Blast Pot and Replacing with New Abrasive" section of the manual for procedures in replacing the abrasive.*

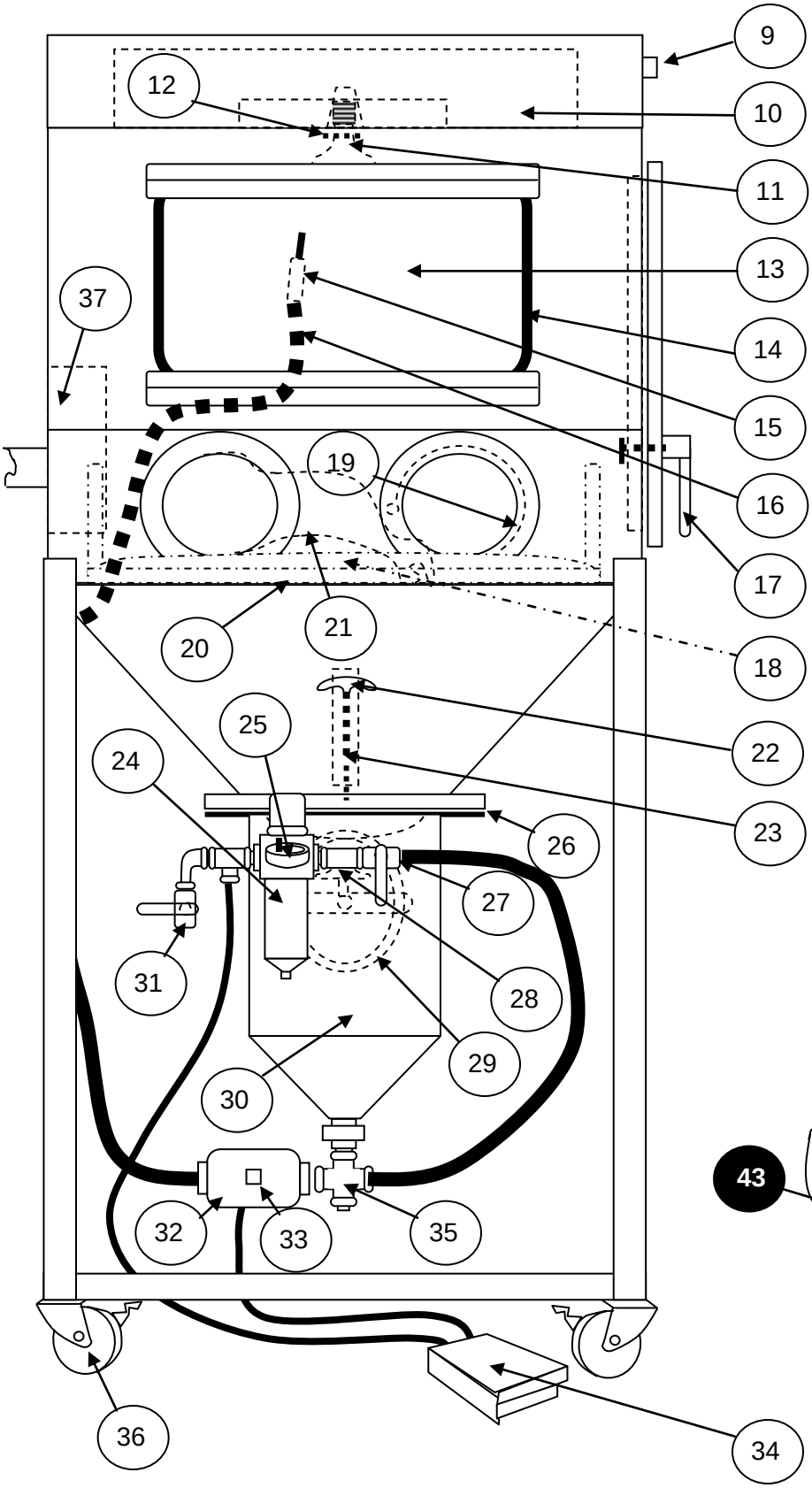
LARGE SURGE OF ABRASIVE AT THE BEGINNING OF THE BLAST	**ABRASIVE FLOW ASSEMBLY IS WORN OUT:** *Replace the Air/Abrasive Mixing Cross located beneath the blast pot.*
AIR LEAK HEARD AFTER REFILLING THE BLAST POT WITH ABRASIVE	**POT PLUNGER DID NOT SEAT PROPERLY WHEN BLAST POT WAS PRESSURIZED:** *Depressurize blast pot, push in and pull back on the Pot Plunger Assembly Handle with a slight pressure and simultaneously pressurize the blast pot by opening the Main Air Inlet Valve.* **POT SEAL IS WORN OUT:** *Refer to "Replacing the Pot Seal or Pot Plunger" section of the manual.*
BLAST POT WILL NOT SEAL	**COMPRESSED AIR IS TURNED OFF:** *Make certain that the compressed air to the blast cabinet is turned on.* **POT SEAL IS WORN OUT:** *Refer to "Replacing the Pot Seal or Pot Plunger" section of the manual.* **BLAST REGULATOR IS SET TOO LOW:** *Increase pressure 10 psi; try again.* **TOO MUCH ABRASIVE IN SYSTEM:** *Abrasive is resting on the Pot Plunger, keeping it from getting a good seal.*
SYSTEM WON'T MAINTAIN DESIRED BLAST PRESSURE	**NOZZLE IS WORN OUT:** *Compressor is not large enough to handle the additional air volume necessary to run a larger bore nozzle. Replace blast nozzle.*
OPERATOR IS GETTING SHOCKED BY THE MACHINE	**PART IS BEING HELD IN OPERATOR'S HAND:** *Place part on the work surface while blasting or purchase MBA's Static Electricity Discharge Cuff (P/N 100-22-021) to ground the operator to the blast cabinet.* **PART IS BEING PLACED ON A RUBBER MAT OR OTHER NON-METALLIC SURFACE:** *Place part on the work surface while blasting or purchase MBA's Static Electricity Discharge Cuff (P/N 100-22-021) to ground the operator to the blast cabinet.* **HUMIDITY IS LOW:** *Purchase MBA's Static Electricity Discharge Cuff (P/N 100-22-021) to ground the operator to the blast cabinet.*
ABRASIVE AND/OR DUST IS COMING OUT OF THE VACUUM DUST COLLECTOR EXHAUST BLOWER	**BAG FILTER HAVE A HOLE OR HAS COME LOOSE:** *The dust filter bag has a hole in it or may have come loose from the bag housing on the top. Make sure the bag housing is tight on the bag. If there is a hole in the bag it will show dirt on the outside of the bag. This is an indication that the bag should be replaced unless the bag is new and is defective from the factory.*

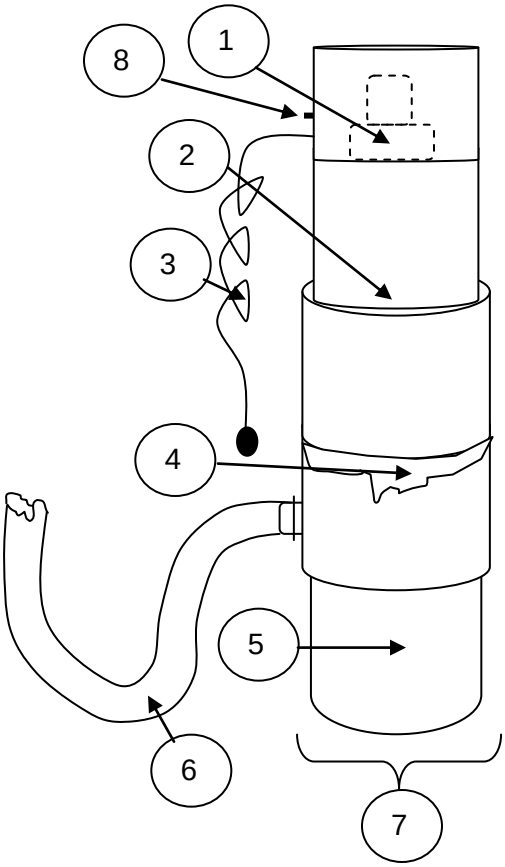
CRYSTALBLAST Pioneer SYSTEMS DIAGRAMS AND PARTS LIST

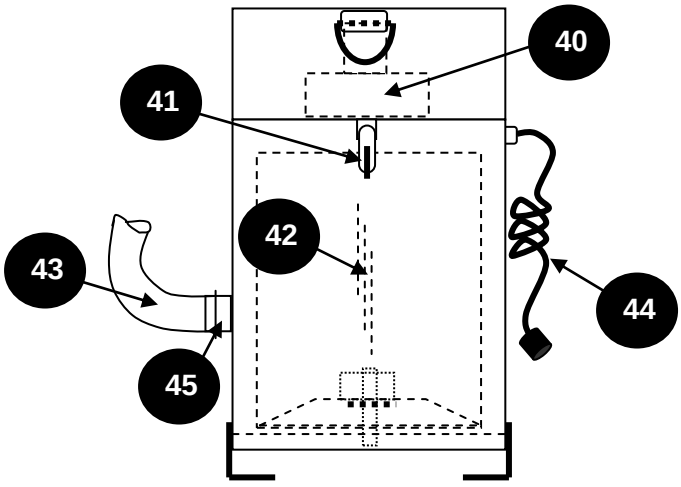
TO FIND THE PART AND PART NUMBER FOR YOUR MACHINE:

1. Refer to the appropriate diagram.
2. Find the location of the part and note the corresponding bubble number.
3. Refer to the corresponding system section of the parts list and locate the corresponding bubble number.
4. If there are multiple listings for the bubble number, the correct part and part number can be determined from the bubble number descriptions.

Crystal Blast Pioneer 2424 Parts Diagram







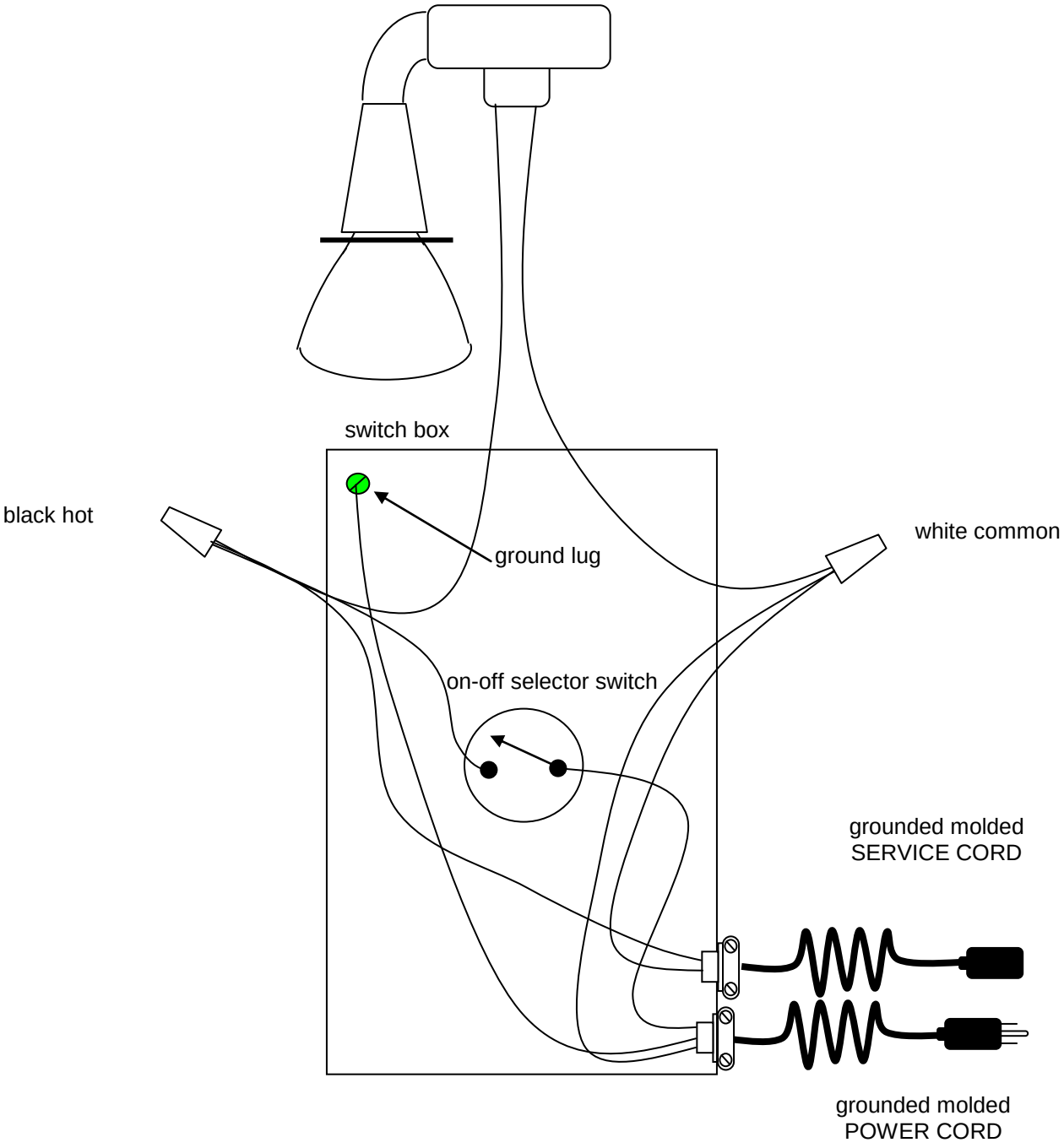
OPTIONAL VAC-110 D.C.

Crystal Blast Pioneer

Bubble #	Part #	Description	Qt.
1.	……	Vacuum Blower Motor	1
2.	……	Top Chamber	1
3.	……	Cord	1
4.	……..	Dust Bag	1
5.	……	Bottom Chamber	1
6.	……	6’ Vacuum Hose	1
7.	……	Vacuum Dust Collector Complete	1
8.	……	Vacuum On-Off Switch	1
9.	100-09-610	On-Off Selector Switch Complete	1
10.	100-06-605	Air Inlet Filter Blue/White Material	1
10.		Air Inlet Gray Material	1
11.	100-09-052	Spot Light, 90 watt	1
12.	100-11-120	Sealing Washer, heat shield	2
13.	101-06-146	Window, Safety Glass	1
13.	100-06-024	Window Protector Glass	1
14.	101-11-147	Window Seal	6 Ft.
15.	109-19-093	3/32” Tungsten Nozzle with Holder for 1/2 hose	1
15.	109-19-594	3/32” Boron Carbide Nozzle with Holder 1/2 hose (optional)	
16.	109-15-600	1/2” OD Micro Blast Hose	10 Ft.
16.	109-15-601	3/8” OD Whip Hose (optional)	
16.	109-19-600	3/8” to 1/2" Adaptor	1
17.	109-06-603	Door Handle Right	1
18.	100-07-102	Optional Armrest Pad	1
19.	102-12-038	Glove Clamp	2
20.	109-25-602	Work Grate (expanded)	1
21.	100-12-136	Gloves 6” COMBO	1Pr.
22.	109-21-014	Pot Plunger Assembly Handle	1
23.	109-21-013	Pot Plunger Assembly Complete	1
24.	100-03-080	Air Regulator/Filter	1
25.	100-13-077	Air Filter Gauge 0-60 PSI	1
26.	109-25-602	Pot Screen (perforated)	1
27.	100-26-098	Abrasive Choke Valve	1
28.	109-21-201	Pot Plunger	1
28.	104-21-176	Pot Seal	1
29.	104-21-171	Cleanout Port Gasket	1
30.	109-21-604	Pressure Pot, (50 pound capacity)	1
31.	100-26-098	Main Air Inlet Valve	1
32.	109-20-200	Pneumatic Pinch Valve	1
32.	109-20-201	Pinch Valve Bladder	1
33.	109-20-105	Inline Micro Filter Complete	1
33.	109-20-106	Inline Micro Filter Element	1
34.	101-06-009	Foot Pedal Valve Complete	1
35.	109-21-300	Air/Abrasive Mixing Cross	1
36.	109-18-604	Wheels (front locking) Swivel	2
36.	109-18-606	Wheels (rear non-locking) Swivel	2
37.	109-01-100	Vacuum Separator	1
40.	100-05-010	Vacuum Blower	1
41.	100-18-600	Latch	1
42.	100-08-005	Filter Cartridge	1
43.	110-14-600	2-1/4” Vacuum Hose	1
44.	100-09-040	Power Cord VAC-110	1
45.	100-08-603	Vacuum Hose End Connector	2

CRYSTALBLAST PIONEER

1 each 90 watt quartz spot light



120VAC

WARRANTY

Media Blast & Abrasives, Inc., hereinafter known as "Seller" warrants the equipment and products sold hereunder against defects in material and workmanship under normal use and service excluding abrasion, erosion and corrosion for a period of one (1) year from date of shipment to Buyer. Equipment, products or parts manufactured by others but furnished by Seller will be repaired or replaced only to the extent of the original manufacturer's warranty (except motors). Buyer shall promptly report all asserted defects in the equipment, products or parts to Seller and shall afford Seller a reasonable opportunity to inspect all asserted defects. Seller's entire liability, whether under warranty, contract, negligence, or otherwise, shall be limited to repair or replacement, F.O.B. Seller's place of business, of the original equipment found to be defective within the warranty period. Seller may void warranty if replacement parts installed in the machine are not genuine Media Blast & Abrasives, Inc. parts. Buyer shall be liable for and indemnify Seller against any and all claims, losses, or causes of action or judgments of any kind arising from or on account of personal injuries or death or damages to property resulting from or caused by Buyer's negligence or improper installation, operation or maintenance of the equipment.

The foregoing obligations are in lieu of all other obligations and liabilities including negligence and all warranties of merchantability or otherwise, expressed or implied in fact or by law, and state our entire and exclusive liability and buyer's exclusive liability for any claim of damages in connection with the sale or furnishing of goods or parts, their design, suitability for use, installation or operation of the equipment covered by this agreement. Seller will in no event be liable for any special or consequential damages whatsoever, and our liability under no circumstances will exceed the contract price for the goods for which liability is claimed.

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