CrystalBlast™

Sandcarving Equipment

Operator's Manual

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IMPORTANT INFORMATION

Congratulations on your purchase of the CrystalBlast 3624! You have just received the finest sandcarving cabinet available on the market today. Manufactured by Media Blast & Abrasives, Inc., the CrystalBlast 3624 was designed with the combined experience of over 75 years in the abrasive blasting industry. You have purchased a machine with many of the same features that are normally found on expensive industrial blast machines. Many of the features are so unique that they are patented.

The CrystalBlast 3624 is very easy to operate and maintain. However, there are several important factors of which you should be aware:

- **ALWAYS USE CLEAN, DRY COMPRESSED AIR.** Moisture will cause abrasive to stick together preventing flow. Your CrystalBlast model is equipped with a cartridge filter, so excessive moisture will cause the dust to stick to the filter. The dust will not be released when the filter is pulsed via the manual pulse filter clean and the filter will prematurely plug with dust. Please review the following compressed air requirements prior to operating the 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 25%, otherwise your blast pressure may not reach 30 psi. Premature compressor failure can be a secondary result of using a marginally sized air compressor. The optional 1/8" i.d. nozzle requires 10.1 cfm @ 30 psi.

- **DO NOT BLAST ABOVE 60 PSI.** This machine is designed for operation at low pressures. Blasting at pressures in excess of 40 psi will lead to premature failure of the abrasive and premature failure of wear components (blast hose, blast nozzles, etc.). The machine is governed to stop blasting at pressures above 60 psi.

- **ALWAYS DEPRESSURIZE THE POT WHEN YOU ARE DONE BLASTING.** 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 below 70-80 psi. Furthermore, the next time that the air compressor is turned on, the system will immediately begin blasting until the air compressor builds up air pressure to 80 psi.

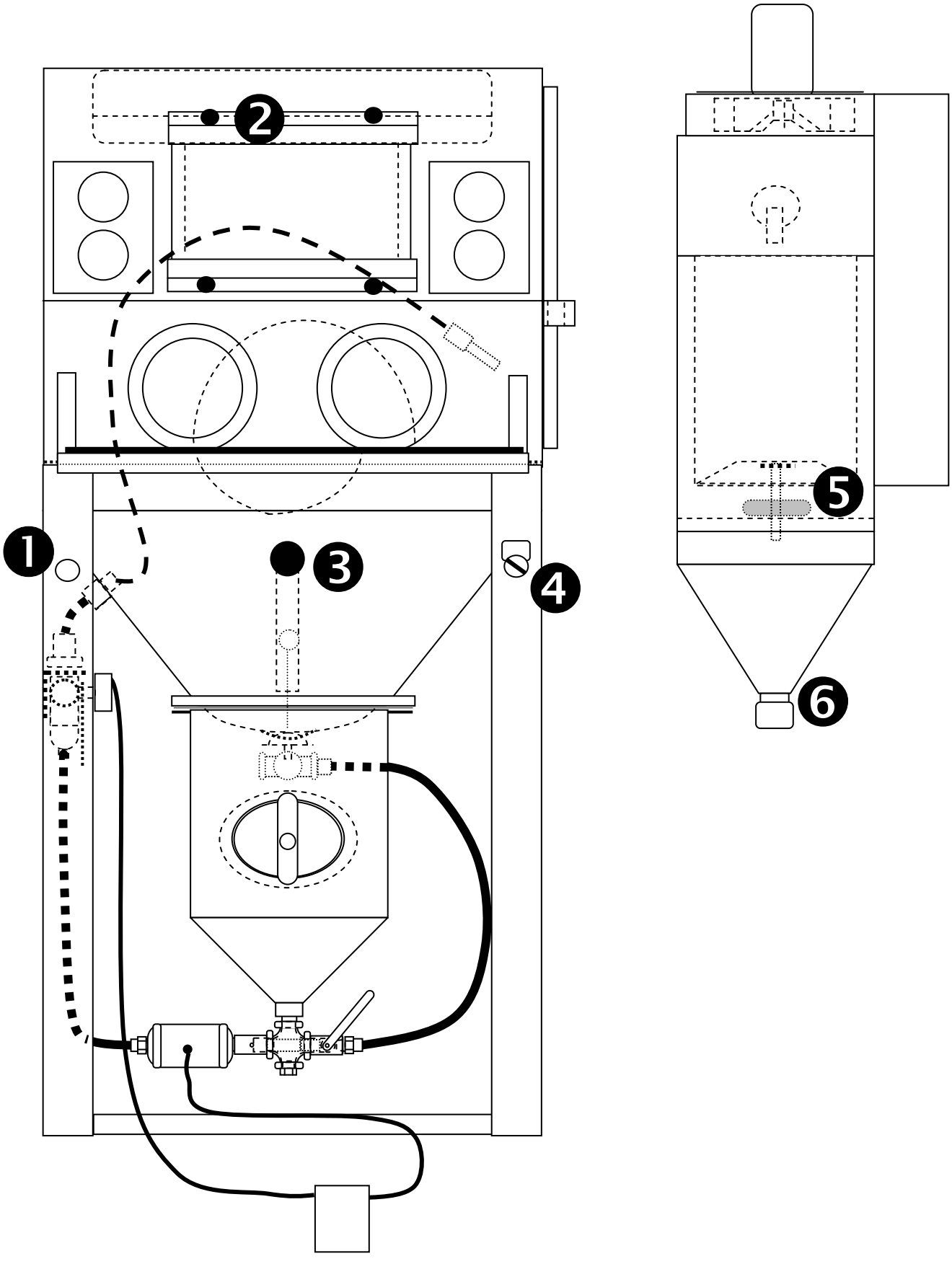
- **REGULARLY CHECK THE BORE OF THE NOZZLE.** It is important to replace the nozzle after it has worn 1/32". Not only will the worn nozzle consume more compressed air, but the abrasive will impact the part more aggressively and increase the potential for damaging the mask. As the volume of air and abrasive increases, it can also create additional wear on the blast hose.

- **USE MBA REPLACEMENT COMPONENTS.** Replacement of worn components with parts not purchased from PhotoBrasive Systems will void the warranty. The components used by PhotoBrasive Systems are of the highest quality and will provide the longest serviceable life.

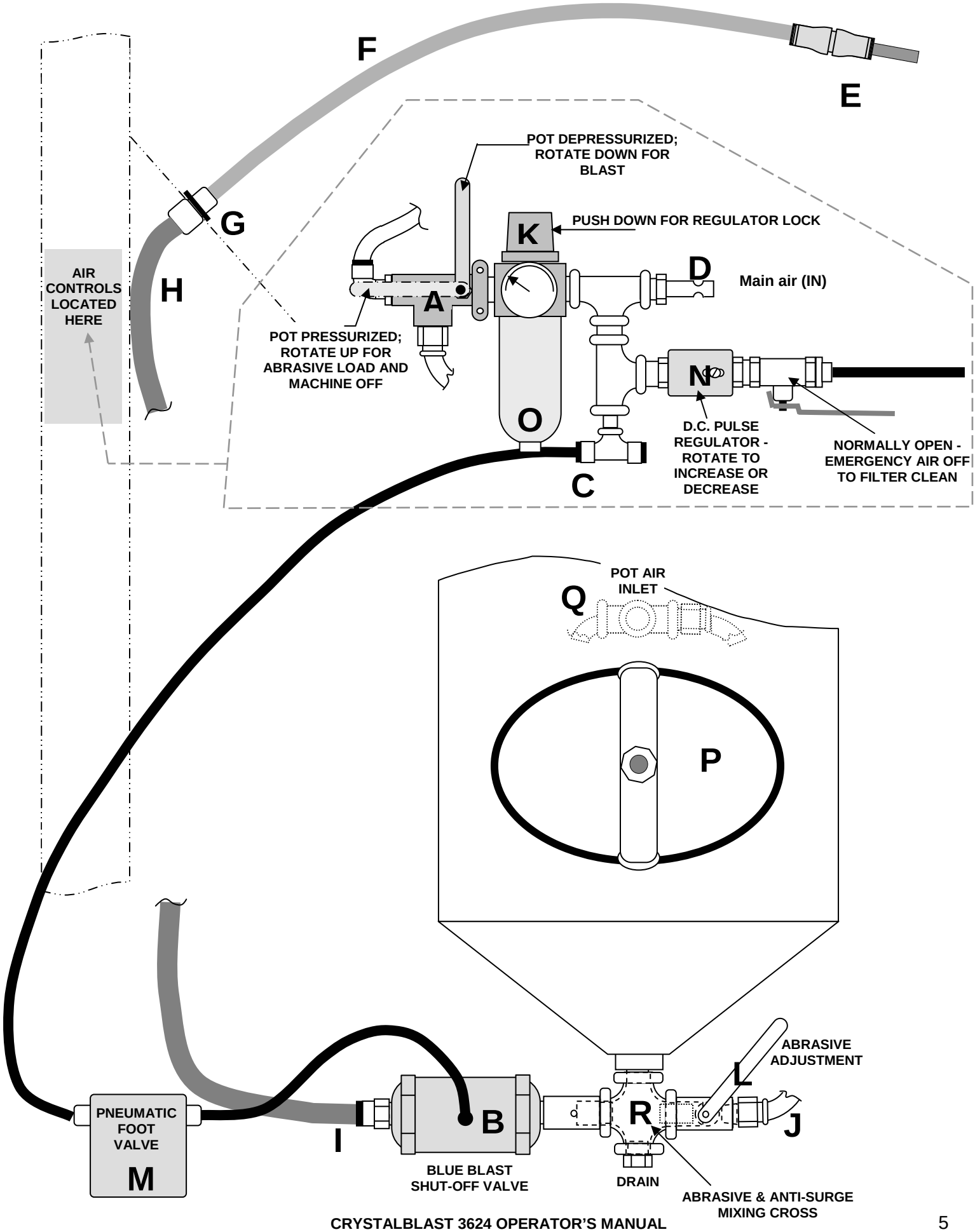
- **REVIEW THE TROUBLESHOOTING GUIDE AND FOLLOW THE INSTRUCTIONS PRIOR TO CALLING PHOTOBRASIVE FOR TROUBLESHOOTING ASSISTANCE.** Most problems associated with the machine can be identified by simply consulting the Troubleshooting Guide. However, if your problem cannot be found in the Troubleshooting Guide, please give us a call. Nearly all equipment malfunction issues can be resolved over the telephone. Many times, it does not even require the purchase of new components!

Best wishes for a profitable return from your new machine!
PhotoBrasive Systems & Media Blast & Abrasives, Inc.

CrystalBlast Operation & Maintenance Diagram



CrystalBlast Pneumatics Reference Diagram



GETTING STARTED

Inlet Pressure
125 psi maximum

INSTALLING THE MACHINE: If your machine will not fit through your doorway, please follow these directions for dismantling the machine:

1. Remove the two ¼" black tubes located on the side of the dust collector. These tubes are used in the operation of the manual reverse pulse filter cleaning system. Mark one of the tubes so that the tubes are not transposed when replaced on the dust collector. The tubes are easily removed by pressing in on the end ring of the tube fitting while pulling on the tube.
2. Remove the hopper from the dust collector. This is easily accomplished by unlatching the four clasps that hold the hopper to the body of the dust collector. Place the hopper aside.
3. Disconnect wiring from exhaust blower motor. This is accomplished by removing the plate located on the top of the blower motor. Disconnect the three wires (write down or remember their locations). *Note: Never try to accomplish this if you are not comfortable with common electrical practice.*
4. Remove the cartridge filter from the dust collector housing. This is accomplished by unthreading the large black knob (**Item 5** – Operation & Maintenance Diagram). Once the knob has been loosened, the filter mounting arm can be rotated so that it drops out through the bottom of the dust collector housing. The filter should drop down with it. Be careful not to damage the filter; it is fragile.
5. Remove the three bolts inside the filter housing that attach the dust collector to the blast cabinet enclosure.
6. Remove the two bolts located on the top of the dust collector that hold the dust collector mounting flange to the blast cabinet enclosure. Use caution to insure that the dust collector is supported prior to removing these bolts.
7. Remove the outrigger legs located at the bottom rear of the blast enclosure. These are attached with two bolts.
8. Move the blast cabinet through the desired doorways.
9. Reinstall the components in reverse order and reconnect the exhaust blower motor.

UNIT PLACEMENT: Allow adequate clearance for loading and unloading the blast cabinet. PhotoBrasive Systems recommends 36" in front of the cabinet for the operator and 36"-48" on the door side of the cabinet. Always leave at least 9" clearance behind the cabinet to facilitate air flow from the exhaust of the dust collectors. Never place 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: Place foot pedal on floor in front of cabinet with ¼" tubing facing the back of the cabinet. Push the short tube into the tube fitting on the blue blast shut-off valve (**Item B** - Pneumatics Reference Diagram). Push the long tube into the tube fitting located next to the pressure regulator on the left leg of the blast cabinet (**Item C** - Pneumatics Reference Diagram).

ELECTRICAL REQUIREMENTS AND CONNECTION: The CrystalBlast sandcarving cabinets are wired for standard 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.

AIR REQUIREMENTS AND CONNECTION: The standard 3/32" i.d. nozzle requires 5.7 cfm @ 30 psi. The optional 1/8" i.d. nozzle requires 10.1 cfm @ 30 psi. *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 25% (7.6 cfm for the 3/32" nozzle and 13.5 cfm for the 1/8" nozzle), otherwise your blast pressure may not reach 30 psi. Premature compressor failure can be a secondary result of using a marginally sized air compressor. *Note: The system must provide at least 40 psi more to the cabinet than the actual blast pressure. MBA recommends a two stage air compressor that automatically turns on when the air pressure drops below 95 psi. This alleviates any potential problem of losing the seal on the blast shut-off valve.*

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. Undersizing the air compressor will create a situation that does 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 (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 the air compressor will be strained.*

The air hose must be at least ¼" i.d.. Couple to the machine (**Item D** - Pneumatics Reference Diagram) using quick disconnect sleeve couplers.

CHANGING THE ABRASIVE HOSE LOCATION: We recommend that the machine be operated for an hour prior to making the decision to move the abrasive hose from one side of the blast cabinet to the other side. The CrystalBlast system uses the most user-friendly abrasive hose on the market; most users find it unnecessary to relocate the hose. Use the following procedure to relocate the abrasive hose:

1. Remove the nozzle/nozzle holder (**Item E** – Pneumatics Reference Diagram) from the end of the blast hose (refer to Inspecting and Replacing the Blast Nozzle in the Maintenance section of this manual).
2. Remove the blow-off gun from the end of the black tubing. The blow-off gun is easily removed by pressing in on the end ring of the tube fitting while pulling on the tube.
3. Remove the work grate from the inside of the blast enclosure.
4. Remove the abrasive hose located inside the blast cabinet (**Item F** – Pneumatics Reference Diagram; refer to Replacing the Internal Cabinet Blast Hose in the Maintenance section of this manual).
5. Loosen and unscrew the bulkhead tension nut located inside the cabinet hopper (**Item G** – Pneumatics Reference Diagram) and drop the bulkhead fitting from the hopper wall.
6. Remove the external abrasive hose (**Item H** – Pneumatics Reference Diagram) from the bulkhead fitting using the same method as the internal abrasive hose.
7. Remove the plastic cabinet hopper plug from the right side of the cabinet by pushing on it from inside the cabinet hopper.
8. Install the bulkhead fitting on the right side of the cabinet. Lock it into position using the bulkhead tension nut. Be sure that the bulkhead tension nut is located on the inside wall of the hopper.
9. Install the plastic cabinet hopper plug in the left side hole of the cabinet that previously held the bulkhead fitting.
10. Install the internal abrasive hose by pushing the end of the hose into the bulkhead fitting.
11. Thread the internal abrasive hose and the blow-off gun tubing through the hole on the right hand side of the front perforated work grate. Install the front perforated work grate in position.
12. Place the rear perforated work grate back into location. Make sure that the blow-off gun hose and abrasive hose are not pinched between the two work grates or a workgrate and the wall of the blast cabinet.
13. Reinstall the blow-off gun on the end of the black tubing.
14. Reinstall the nozzle/nozzle holder on the end of the internal abrasive hose.

15. Remove the external abrasive hose from the blue blast cut-off valve (**Item B** – Pneumatics Reference Diagram).
16. Remove the air inlet hose (**Item J** – Pneumatics Reference Diagram) from the ball valve located on the pipe string beneath the blast pot.
17. Rotate (tighten) the entire pipe string assembly (located underneath the blast pot) 180°.
18. Reinstall the external abrasive hose onto the blue blast cut-off valve.
19. Reinstall the air inlet hose onto the ball valve.
20. Attach the external blast hose to the bulkhead fitting.

SELECTING THE RIGHT ABRASIVE: There are three different types of abrasives that can be effectively used for etching and carving on glass; brown aluminum oxide, white aluminum oxide and 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 is less dusty than silicon carbide, it lasts longer, and it also costs less than the other two abrasives. 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.
- ***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 is also less dusty. Both white and brown aluminum oxide are more forgiving on the mask material.
- ***Silicon Carbide*** - Silicon carbide is an aggressive abrasive that can be beneficial in achieving a much faster etch. In addition, silicon carbide never loses its sharp edge. The blast operator will see a little more dust than the aluminum oxide, so it is critical that the blast cabinet be equipped with a good dust collector to evacuate the dust quickly from the blast cabinet.

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 range used is 150 and 220 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 equipment warranty.*

LOADING THE SYSTEM WITH ABRASIVE: Turn on the power to the machine (**Item 4** – Operation & Maintenance Diagram). The abrasive of choice should be loaded through the cabinet enclosure door with the dust collector running. The CrystalBlast 3624 system requires an initial charge of 48-50 pounds of abrasive. *Note: Never add abrasive to the system unless the dust collector is running.*

There is no need to pre-screen the abrasive. The CrystalBlast system includes a stainless steel scalper screen designed to remove all particles large enough to clog the nozzle. Additional abrasive should be added from time to time to maintain maximum levels in the system. Shorter blast intervals between reloading abrasive into the blast pot is a good indication that more abrasive needs to be added to the system. (EXAMPLE: The 3/32" blast nozzle consumes approximately 1.2 pounds per minute of abrasive for an approximate total blast duration of 35 minutes with a full abrasive charge in the blast pot. If the total blast time to empty the pot falls to 18 minutes, then 20-25 pounds of abrasive can safely be added 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.*

FILLING THE BLAST POT: To fill the blast pot, make sure that the blast pot has been depressurized. This can be accomplished by rotating the arm of the Pot Depressurization ball valve located on the left leg of the blast cabinet (**Item A** - Pneumatics Reference Diagram) from the horizontal to vertical position. Once the blast pot has been depressurized, the large ball handle (**Item 3** – Operation & Maintenance Diagram) located in the front center of the blast cabinet hopper can be pushed toward the rear of the cabinet. This drops the pop up valve from the seated position at the top of the blast pot and allows the abrasive to flow into the blast pot. Occasionally "pumping" the ball handle will cause more of the abrasive to slide down the walls of the hopper and into the blast pot. Once the blast pot has been filled with abrasive, the ball handle can be released. To reseal and pressurize the blast pot, pull the ball handle (with slight pressure) and rotate the arm of the ball valve from the vertical to the horizontal position. This will pressurize the blast pot. If any audible air leakage is noted, depressurize the pot, and push the ball handle back and forth rapidly several times. Pull back on the ball handle while repressurizing the blast pot (rotate the ball valve handle into the vertical position). This is known as a "hard seat" to seal the blast pot. *Note: Air compressor receiver tank must have a pressure of 80-90 psi prior to pressurizing the blast pot.*

ADJUSTING THE BLAST PRESSURE: The blast pressure is adjusted from the pressure regulator (**Item K** – Pneumatics Reference Diagram) located on the inside of the left leg of the blast cabinet. 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 is 20 – 30 psi. *Note: The machine will not operate at pressures greater than 60 psi.*

ADJUSTING THE ABRASIVE FLOW: The abrasive flow is adjusted by rotating the arm of the abrasive flow valve (**Item L** – Pneumatics Reference Diagram; the valve is located on the inlet side of the pipe cross underneath the blast pot). When the arm is perpendicular to the hoses, all the air is passing through the blast pot. When the arm is parallel to the hoses, then the maximum amount of air is passing through the pipe string. <u>The abrasive flow valve arm should be set at approximately a 45° angle.</u> Check the abrasive flow through the nozzle. If there is a barely perceptible flow of abrasive through the nozzle, then it is adjusted right. If there is a heavy flow of abrasive through the nozzle, then rotate the abrasive flow valve arm more into the horizontal position (or parallel to the floor). If there is not enough abrasive exiting the nozzle, then rotate the ball valve arm more into the vertical position. Once the abrasive flow has been adjusted, there should be little need to readjust unless the nozzle size or abrasive size is changed.

> ***PROCEDURE FOR UNPLUGGING A PLUGGED ABRASIVE HOSE:*** *Rotate the ball valve handle in very small increments. Completely closing the ball valve (arm in vertical position) can plug the main abrasive hose and stop abrasive flow completely. If this happens, remove the abrasive hose from the blue blast shut-off valve. Drain the hose until it is clear. Reinstall the abrasive hose, open the abrasive flow valve (ball valve located to the side of the blue blast shut-off valve) until horizontal. Depress foot pedal to insure that the line has been cleared, then begin adjusting the abrasive flow valve in small increments by moving the abrasive flow valve arm towards a vertical position.*

WEARING GLOVES: The CrystalBlast 3624 sandcarving cabinet is equipped with open end gauntlets (or sleeves) and a box of disposable latex gloves. This offers the operator the choice of blasting with or without gloves. Abrasive will cause irritation or damage to the skin if it is accidentally and directly exposed to the blast. PhotoBrasive Systems recommends that the operator wear gloves while blasting. Latex or nitrile gloves offer the highest degree of fingertip sensitivity while offering the desirable degree of protection.

READY TO BLAST: The unit is now ready to be used for blasting. Turn on the power to the machine (**Item 4** – Operation & Maintenance Diagram). Place a scrap part in the machine to test blast. Place both arms in the armports. If the unit is a sit down system, rest your elbows on the padded arm rest. Hold the nozzle/nozzle holder like a pencil. Depress the foot pedal and begin blasting the scrap part. *Note: Never point the nozzle at the window. The abrasive will permanently frost the protector window and the possibility exists that the window may break.*

Note: The PhotoBrasive CrystalBlast 3624 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 system will be operated at lower blast pressures than previously experienced.

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. Otherwise, the next time that the air compressor is turned on, the system will immediately begin blasting until the air compressor builds up air pressure to 80 psi.

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	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 CARTRIDGE DUST FILTER					X

CLEANING THE ABRASIVE SCALPER SCREEN: Lift up the rear perforated metal work grate and remove from the cabinet. Use a shop vacuum to clean the debris off the scalper screen. Replace the work grate.

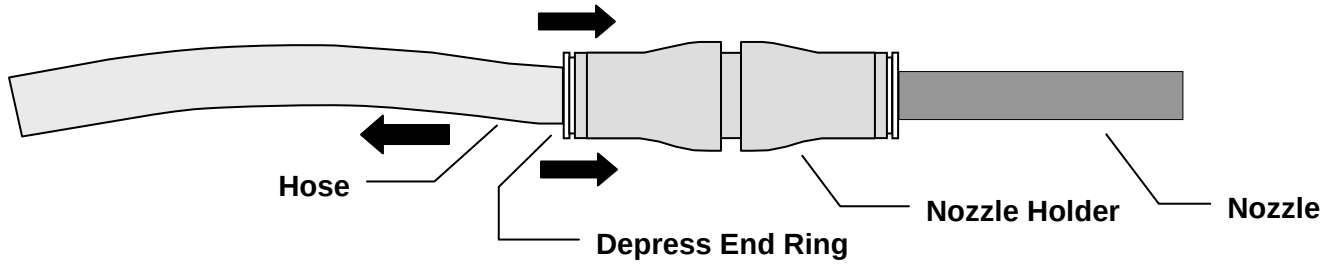
CLEANING THE DUST COLLECTOR CARTRIDGE FILTER: The dust collector cartridge filter should be cleaned at least once per day. To clean the filter, make sure that the machine is operating (lights and dust collector exhaust blower on). Momentarily depress the white button (**Item 1** – Operation & Maintenance Diagram) located on the left leg of the blast cabinet. This button releases a burst of compressed air to clean the cartridge filter from the inside out. Wait 10-15 seconds, then pulse clean the filter again. Note: Cleaning the filter prior to operating the machine at the beginning of the day is advisable. 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.

REMOVING THE DUST FROM THE DUST COLLECTOR: Periodically, the dust must be removed from the dust collector hopper. MBA recommends removing the dust 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 dust, perform the Cleaning the Dust Collector Cartridge Filter procedure. When the filter cleaning has been completed, the dust collector is ready for dust removal.

Unscrew the dust collector hopper drain cap (**Item 6** – Operation and Maintenance Diagram) but do not remove. With one hand, hold the neck of a plastic bag on the pipe nipple above the hopper drain cap (or use a garbage bag with tie straps and tie it to the pipe nipple). With the other hand, grasp the drain cap through one corner of the bottom of the plastic bag. Finish unscrewing the drain cap and move it aside to allow the dust to drain into the bag. Continue to hold the cap through the plastic bag until all of the dust has been drained. Screw the drain cap back on the nipple. Grasp the neck of the plastic bag below the drain cap and remove the bag. The dust should be contained completely in the bag for disposal without exposing the surrounding area to dust.

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 consume 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 (or a 5/32" drill bit if the CrystalBlast was purchased with a 1/8" nozzle). If the drill bit fits into the blast nozzle, then it is time to replace the nozzle.

To replace the blast nozzle, hold the nozzle and nozzle holder (**Item E** – Pneumatics Reference Diagram) in your right hand and the blast hose (**Item F** – 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). As you are pressing, pull the abrasive blast hose the other direction. The hose should release from the nozzle holder. *Note: <u>Do not try to remove the nozzle from the nozzle holder</u>. 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 INTERNAL CABINET BLAST HOSE: 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 the same procedure.*

REPLACING THE EXTERNAL CABINET BLAST HOSE: Use the same procedure as removing the nozzle; the connector end ring must be depressed as the hose is pulled.

REPLACING THE LIGHT BULBS: Unclip the four clips that hold the translucent light cover. Drop the light cover off the fixture. Twist the fluorescent bulb until it releases from the fixture. Remove the bulb and replace. Be sure to reattach all four clips when the light cover is replaced to ensure that no abrasive gets into the fixture.

REPLACING THE WINDOW PROTECTOR OR VIEW WINDOW: Remove the two thumbscrews (**Item 2** – Operation & Maintenance Diagram) that hold the upper window bracket in place. Loosen the two thumbscrews that hold the lower window bracket in place. Remove the two pieces of glass and replace the top view window or the bottom view window protector glass. Replace the two pieces of glass with the laminated safety glass view window on top. Reattach the upper window bracket. Tighten the four thumbscrews.

REPLACING THE DUST COLLECTOR CARTRIDGE FILTER: Prior to replacing the cartridge filter, pulse clean the dust collector with the power to the machine on. Pulse the filter several times (pause about 10-15 seconds between pulses) to ensure that the filter has been sufficiently cleaned. Turn off the power to the machine. Remove the dust from the dust collector hopper (please refer to the REMOVING THE DUST FROM THE DUST COLLECTOR procedure).

Once the dust has been removed and the cap placed back on the hopper, carefully unclip all four latches that hold the dust collector hopper to the dust collector body. When all four latches have been unclipped, the hopper should be hanging suspended about two inches beneath the dust collector body. Remove the latch hooks from one side of the hopper; the hopper should swing out from under the dust collector body.

Unscrew the large knob underneath the dust collector filter (**Item 5** – Operation & Maintenance Diagram). Once the filter is loose, lift up on the filter and rotate the filter bracket (attached to the knob) 45°. Slowly drop the filter and bracket out through the bottom of the dust collector body. Insert the new filter inside the dust collector body using caution to not hit the edges of the filter against any metal edges. Fit the top of the filter over the guide flange. While holding the filter in position, insert the bracket under the filter. Rest the ends of the bracket on the bottom flange of the dust collector body. Screw the knob tight making sure that the guide pin is centered in the hole located on the bottom of the cartridge filter. *Note: Make sure that the rubber washer is affixed to the guide pin prior to tightening the filter. Dust will escape into the work area if the rubber washer is not in place.*

REPLACING THE BLAST SHUT-OFF VALVE SLEEVE: Remove the blue valve body (**Item B** – Pneumatics Reference Diagram) from the pipe string located at the bottom of the blast pot. Place the valve body in a vise and gently tighten in place. Remove both hex nut end covers from the valve body. Remove the valve body from the vise. Insert a large screwdriver into the sleeve. While holding the valve body in one hand, push against the handle of the screwdriver to drive the sleeve out the back of the valve body. Use caution not to injure yourself with the screwdriver. Insert the new valve sleeve into the valve body and replace the hex nut end covers.

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. PhotoBrasive Systems 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.
3. Place a pan underneath the blast pot.
4. Remove the drain plug located on the pipe cross fitting (**Item R** – Pneumatics Reference Diagram) beneath the blast pot. The abrasive will begin draining into the pan.
5. Remove the rear perforated metal workgrate from the cabinet.
6. Blow down all of the abrasive from the walls of the hopper and the ledges so that it drains 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 assure nearly complete evacuation of abrasive, remove the access cover on the front of the blast pot and use a shop vacuum to clean any residual abrasive out of the blast pot.*
7. Replace and tighten the plug on the pipe cross fitting.
8. Replace the perforated metal workgrate.
9. Add 48-50 pounds of new abrasive to the system. *Note: If it is important to remove all the abrasive, remove the access cover on the front of the blast pot. This is accomplished by removing the nut that holds the crab in place. Once the nut and crab have been removed, the blast pot access cover can be manipulated out of the blast pot. 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 BLAST POT SEAL OR THE POP UP VALVE: This maintenance procedure will unlikely be performed for at least the first five years of machine operation. However, eventually the blast pot seal will wear out and need to be replaced.

1. Depressurize the blast pot.
2. Place a pan under the blast pot to catch any abrasive that comes out of the blast pot.
3. Remove the rear perforated metal work grate from the cabinet.
4. Locate the clevis attached to the vertical rod that is attached to the pop up valve for the blast pot. Remove the cotter pin from the clevis pin.
5. Pull the clevis pin to disconnect the spring loaded assembly from the pop up valve/rod/clevis.
6. Unthread the clevis from the rod; the pop up valve should drop down inside the blast pot.
7. Remove the access cover on the front of the blast pot (**Item P** – Pneumatics Reference Diagram). This is accomplished by removing the nut that holds the crab in place. Once the nut and crab have been removed, the blast pot access cover can be manipulated out of the blast pot.
8. Unthread the pipe riser that guides the pop up valve up and down.
9. Remove the pipe riser and pop up valve.
10. Locate the donut shaped pot seal on the abrasive inlet to the blast pot.
11. 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.
12. Install the new blast pot seal.
13. Replace the pop up valve and pipe riser. The parts must be assembled together before putting inside the blast pot and the pipe riser threaded into place. Install the pop up valve with care; make sure that the rod passes through the hole in the scalper screen. Do not tear a hole in the scalper screen.

14. Reinstall the access cover on the front 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.
15. Thread the clevis back onto the pop up valve rod. Tighten.
16. Attach the spring loaded assembly to the clevis with the clevis pin.
17. Reattach the cotter pin to the clevis pin.
18. Check the operation of the spring loaded assembly by pushing and pulling the ball handle (**Item A** – Pneumatics Reference Drawing) several times.
19. Repressurize and depressurize the blast pot several times. Be sure to pull slightly on the ball handle each time the pot is pressurized and push the ball handle to drop the pop up valve each time the pot is depressurized.
20. Reinstall the perforated metal workgrate.

ADJUSTING THE DUST COLLECTOR PULSE VALVE PRESSURE: As a general rule, the in-line dust collector pulse valve regulator (**Item N** – Pneumatics Reference Diagram) should never be adjusted. It is pre-adjusted at the factory to 70 psi. However, certain situations may warrant adjusting the pressure of the filter cleaning pulse. DO NOT ADJUST THE DUST COLLECTOR PULSE VALVE REGULATOR PRIOR TO CONSULTING FACTORY. To adjust the pulse valve regulator:

1. Perform the work from the back side of the blast cabinet.
2. Loosen the screw on the outer red sleeve.
3. Rotate the sleeve counter-clockwise to increase the pressure. Rotate the sleeve clockwise to decrease the pressure.
4. Tighten the screw on the outer red sleeve.

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 and push the ball handle (located on the front of the blast cabinet hopper) to refill the blast pot with abrasive.* **NO ABRASIVE IN THE CABINET:** *Add 48-50 pounds of abrasive to the system. Be sure that the dust collector is on when the cabinet is loaded with abrasive.* **ABRASIVE FLOW VALVE IS NOT ADJUSTED CORRECTLY:** *Rotate 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 reoccurence. Check the filter trap on the air regulator; drain if there is water in it. Install 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 rotating the ball valve handle (located on the left leg of the blast cabinet) to the horizontal position.* **BLAST NOZZLE IS PLUGGED:** *Use a small, stiff wire to dislodge the obstruction.* **ABRASIVE FLOW VALVE COMPLETELY CLOSED:** *If the abrasive flow valve is completely closed (abrasive flow 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	**BLAST SHUT-OFF VALVE SLEEVE HAS A HOLE:** *Immediately decompress the blast pot. Turn off main supply of air to the blast cabinet. Refer to the "Replacing the Blast Shut-off 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 BLAST SHUT-OFF VALVE:** *Immediately decompress the blast pot. Remove the blue blast shut-off 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.* **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 flow 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 reoccurence. Install 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 pipe cross located beneath the blast pot.*
AIR LEAK HEARD AFTER REFILLING THE BLAST POT WITH ABRASIVE	**POP UP VALVE DID NOT SEAT PROPERLY WHEN BLAST POT WAS PRESSURIZED:** *Depressurize blast pot, pull the ball handle with a slight pressure and simultaneously pressurize the blast pot.* **POT SEAL IS WORN OUT:** *Refer to "Replacing the Pot Seal or Pop Up Valve" 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 Pop Up Valve" 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 pop-up valve, 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 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 Static Electricity Discharge Cuff (P/N 100-22-021) to ground the operator to the blast cabinet.* **HUMIDITY IS LOW:** *Purchase Static Electricity Discharge Cuff (P/N 100-22-021) to ground the operator to the blast cabinet.*
AIR LEAK HEARD AFTER REFILLING THE BLAST POT WITH ABRASIVE	**POP UP VALVE DID NOT SEAT PROPERLY WHEN BLAST POT WAS PRESSURIZED:** *Depressurize blast pot, pull the ball handle with a slight pressure and simultaneously pressurize the blast pot.* **POT SEAL IS WORN OUT:** *Refer to "Replacing the Pot Seal or Pop Up Valve" section of the manual.*

DUST COLLECTOR PULSE CLEANING VALVE DOES NOT SHUT OFF	**DEBRIS IS LODGED IN THE PULSE VALVE DIAPHRAGM:** *Turn off the emergency shut-off ball valve located on the behind the air pressure regulator on the left leg of the blast cabinet. Contact the factory for instructions on repairing the diaphragm valve.* **ADJUST INLINE DUST COLLECTOR PULSE VALVE REGULATOR:** *Consult factory prior to adjusting the regulator.*
ABRASIVE AND/OR DUST IS COMING OUT OF THE EXHAUST BLOWER SILENCER	**CARTRIDGE FILTER IS NOT TIGHT:** *A loose filter will allow dust to escape from the dust collector. Refer to "Replacing the Cartridge Filter" section of the manual to determine procedure for tightening the cartridge filter.* **CARTRIDGE FILTER IS DAMAGED:** *Refer to "Replacing the Cartridge Filter" section of the manual.* **RUBBER WASHER NOT PLACED ON GUIDE PIN WHEN NEW FILTER WAS INSTALLED:** *The rubber washer seals the hole in the bottom of the cartridge filter. Replace the rubber washer on the guide pin. Refer to "Replacing the Cartridge Filter" section of the manual.*

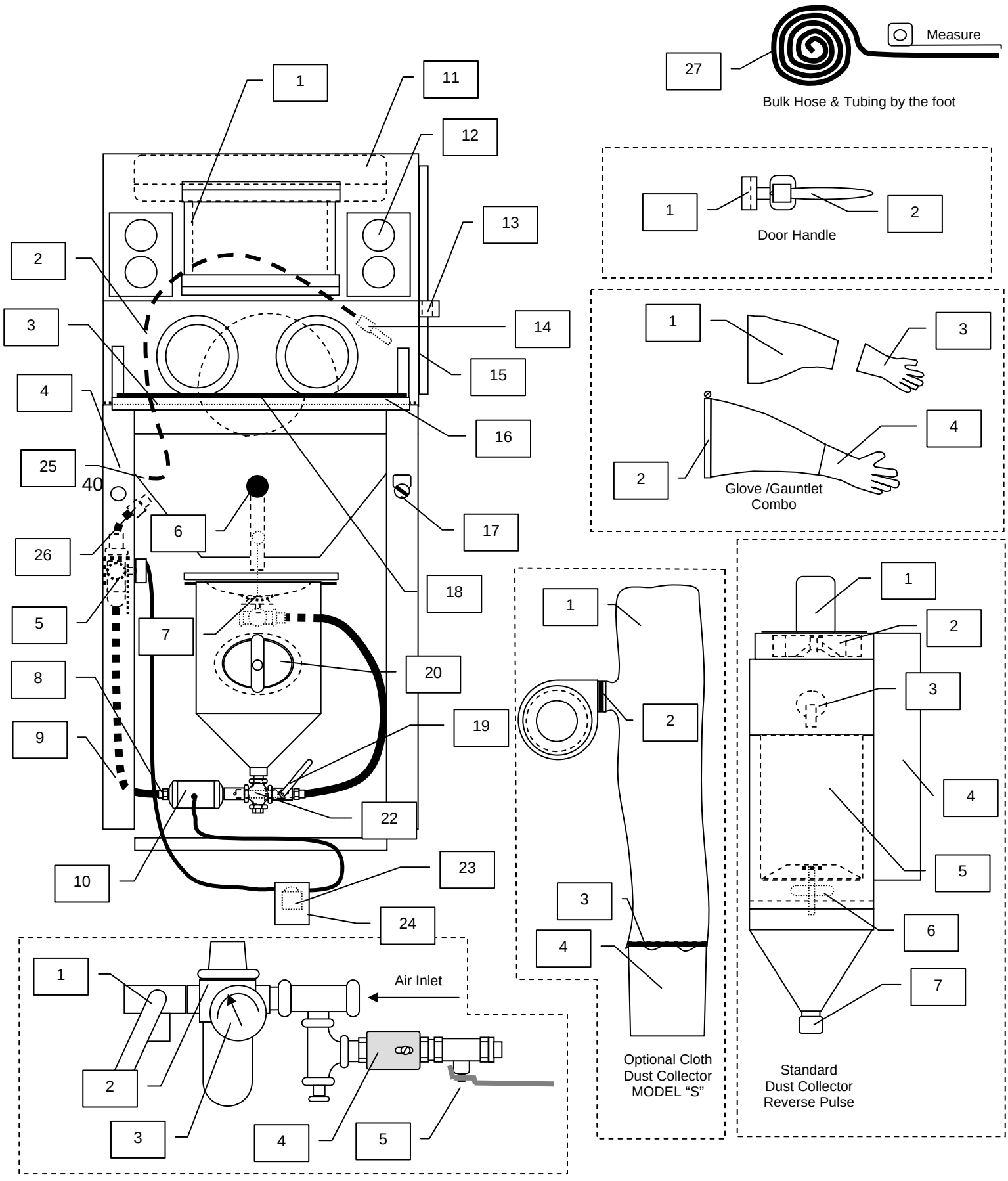
CRYSTALBLAST 3624 SYSTEM DIAGRAM AND PARTS LIST

TO FIND THE PART AND PART NUMBER FOR YOUR MACHINE:

1. Determine in which system the part is most likely to be found (hardware, pneumatic, dust collector, sheet metal, or electrical).
2. Refer to the appropriate diagram.
3. Find the location of the part and note the corresponding bubble number.
4. Refer to the corresponding system section of the parts list and locate the corresponding bubble number.
5. 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 3624 Parts Diagram

Stand Up & “Ergo” Sit Down



Parts for Crystal Blast 3624

Bubble #	Part #	Description
1	101-06-146	View Window
1	100-06-024	Protector Glass, (cannot be shipped)
1	101-11-147	Bladder Seal
2	109-15-375	Abrasive Hose to Nozzle, by the foot
3	109-25-030	Work Grate 3024 (set)
3	109-25-036	Work Grate 3624 (set)
4	100-26-008	Manual Pulse Valve
5		**see air manifold detail**
6	109-21-010	Pot Fill Ball Handle
6	109-21-012	Pot Fill Assembly Complete
6	109-21-011	Pot Fill Return Spring
7	109-21-200	Pot Seal
7	109-21-201	Pot Plunger
8	100-20-100	Hose Fitting, 1/2 Male Pipe to 1/2 Hose OD
9	109-15-101	Abrasive hose Pinch Valve to Cabinet
10	109-20-200	Abrasive Pinch Valve
10	109-20-201	Abrasive Pinch Valve Bladder
11	100-09-053	Fluorescent Light Fixture Complete
11	100-09-054	Fluorescent Light, each
12	100-06-085	Inlet Filter
13		**see door handle detail**
14	109-19-092	3/32 Tungsten Carbide Nozzle with Holder
14	109-19-125	1/8 Tungsten Carbide Nozzle with Holder
15	100-11-030	1/2 x 1-1/2 x 25’ Door Seal, per roll
16	100-07-100	Bolt-On Armrest Complete
16	100-07-101	Drop-In Padded Armrest
17	100-09-020	Light and Blower Switch
18	109-01-100	Abrasive Separator Reclaimer
19	100-26-098	Choke Valve
20	109-11-100	Pot Access Cover Seal
22	109-21-300	Abrasive Mixing Valve Cross (anti surge)
23	100-26-086	Pneumatic Valve
24	100-20-004	Foot Valve, less pneumatic valve
25	109-20-101	3/8 Bulkhead Fitting
26	109-20-102	3/8 Pipe – 1/2 Tube

Bulk Hose Detail

27	109-15-375	3/8” OD Abrasive Hose, by the foot
27	109-19-500	1/2" OD Abrasive Hose, by the foot
27	100-14-051	1/4" PVC Tubing, by the foot
27	100-14-004	3/8” PVC Tubing, by the foot
27	100-14-005	1/2" PVC Tubing, by the foot

Door Handle Detail

1	100-06-091	Door Strike
2	100-06-092	Door Latch

Glove and Gauntlet Detail

1	109-12-100	Gauntlets, pair
2	102-12-038	Glove / Gauntlet Clamp, each
3	109-12-101	Disposable Latex Gloves, box of 100 large
4	100-12-136	Combo Gloves, 6”

Air Manifold Detail

1	109-26-001	Blow Down Valve, 3 way
2	109-03-100	Regulator-Filter-Gauge-Mounting Nut
3	109-13-100	Gauge Only
4	100-03-001	Pulse Regulator
5	100-26-002	Emergency Ball Valve Shut-off

Standard Cartridge Dust Collector

1	101-05-132	Motor 1/2 HP - 120V
2	100-05-312	Impeller, 10 Inch Diameter
3	100-08-630	Pulse Valve
4	109-06-100	Silencer
5	100-08-005	110 Sq.Ft. Filter Cartridge
6	100-08-006	Filter Bracket Tightening Assembly, complete
7	100-08-142	Dust Collector Drain Cap

Optional Cloth Dust Collector: Model S

1	100-08-039	Dust Bag, T Style
2	101-16-135	Bag Clamp
3	101-16-136	Lower Bag Clamp
4	101-06-134	Dust Pail

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 judgements 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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