

# Fortune Metal 3D Suction Blast Cabinet O. M. 29373

**DATE OF ISSUE: 09/19**

**REVISION:**

## **NOTICE TO PURCHASERS AND USERS OF OUR PRODUCTS AND THIS INFORMATIONAL MATERIAL**

Clemco proudly provides products for the abrasive blasting industry and is confident that industry professionals will use their knowledge and expertise for the safe and efficient use of these products.

The products described in this material, and the information relating to these products, are intended for knowledgeable, experienced users. It is the responsibility of the user to ensure that proper training of operators has been performed and a safe work environment is provided.

No representation is intended or made as to the suitability of the products described here for any purpose or application, or to the efficiency, production rate, or useful life of these products. All estimates regarding production rates or finishes are the responsibility of the user and must be derived solely from the user's experience and expertise, not from information contained in this material.

It is possible that the products described in this material may be combined with other products by the user for purposes determined solely by the user. No representations are intended or made as to the suitability of or engineering balance of or compliance with regulations or standard practice of any such combination of products or components the user may employ.

This equipment is only one component of a cabinet blasting operation. Other products, such as air compressors, air filters and receivers, abrasives, equipment for ventilating or dehumidifying, or other equipment, even if offered by Clemco, may have been manufactured or supplied by others. The information Clemco provides is intended to support the products Clemco manufactures. Users must contact each manufacturer and supplier of products used in the blasting operation for warnings, information, training, and instruction relating to the proper and safe use of their equipment.

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**1.0 INTRODUCTION**

**1.1 Scope of Manual**

1.1.1 These instructions cover setup, operation, maintenance, troubleshooting, optional accessories, and replacement parts for the Fortune Metal 3D Suction Blast Cabinet with a pull-thru dust collector.

1.1.2 The instructions contain important information required for safe operation of the cabinet. Before using this equipment, all personnel associated with the blast cabinet operation must read this entire manual and all accessory manuals to become familiar with the operation, parts, and terminology.

**1.2 Safety Alerts**

1.2.1 Clemco uses safety alert signal words based on ANSI Z535.4-2011 to alert the user of a potentially hazardous situation that may be encountered while operating this equipment. ANSI's definitions of the signal words are as follows:



**This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**

**NOTICE**

**Notice indicates information that is considered important, but not hazard-related, if not avoided, could result in property damage.**

**CAUTION**

**Caution indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.**

**WARNING**

**Warning indicates a hazardous situation that, if not avoided, could result in death or serious injury.**

**! DANGER**

**Danger indicates a hazardous situation that, if not avoided, will result in death or serious injury.**

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**1.4 General Description**

**1.4.1** The Fortune Metal 3D Suction Blast Cabinet is intended for light-duty, occasional use. Refer to other ZERO® cabinets with media reclamation systems and reverse-pulse cartridge dust collectors for frequent or prolonged blasting applications. The blast cabinet encloses the blasting environment to provide efficient blasting while maintaining a clean surrounding work area. Production rates are influenced by size of nozzle, compressor output, working pressure, type and size of media, angle and distance of the nozzle from the blast surface, condition of the blast surface product to be removed, and finish required. The cabinet consists of two major components:

1. Cabinet enclosure
2. Pull-thru, bag-type dust collector

**1.4.2 Dust Collector:** The pull-thru dust collector utilizes a cloth-bag filter that collects dust on the outer surface. Dust bags perform adequately for occasional cabinet use. This type of dust collection must never be used in applications that generate toxic dust.

**1.4.3** Refer to Figure 1 for the general arrangement of the cabinet and dust collector, and for callouts of main components. Refer to Figure 2 for the blast gun and feed assembly layout.

**1.5 Theory of Operation**

**1.5.1** After the cabinet is correctly set up and turned ON, it is ready for operation by actuation of the foot pedal. Fully depressing the foot pedal causes air to flow through the blast gun. Air moving through the gun draws media from the cabinet hopper and into the blast-gun mixing chamber. The media mixes with the air stream and is propelled out the nozzle. After striking the object being blasted, the heavier, reusable blast media falls through the mesh work table into the cabinet hopper for reuse.

Lighter-weight fines and dust that normally remain suspended are drawn from the cabinet and into the dust collector, which traps dust on the outer surface of the filter bag. Dust accumulates in the lower drum, and clean air discharges from the exhaustor on the upper drum. When the foot pedal is released, blasting stops.

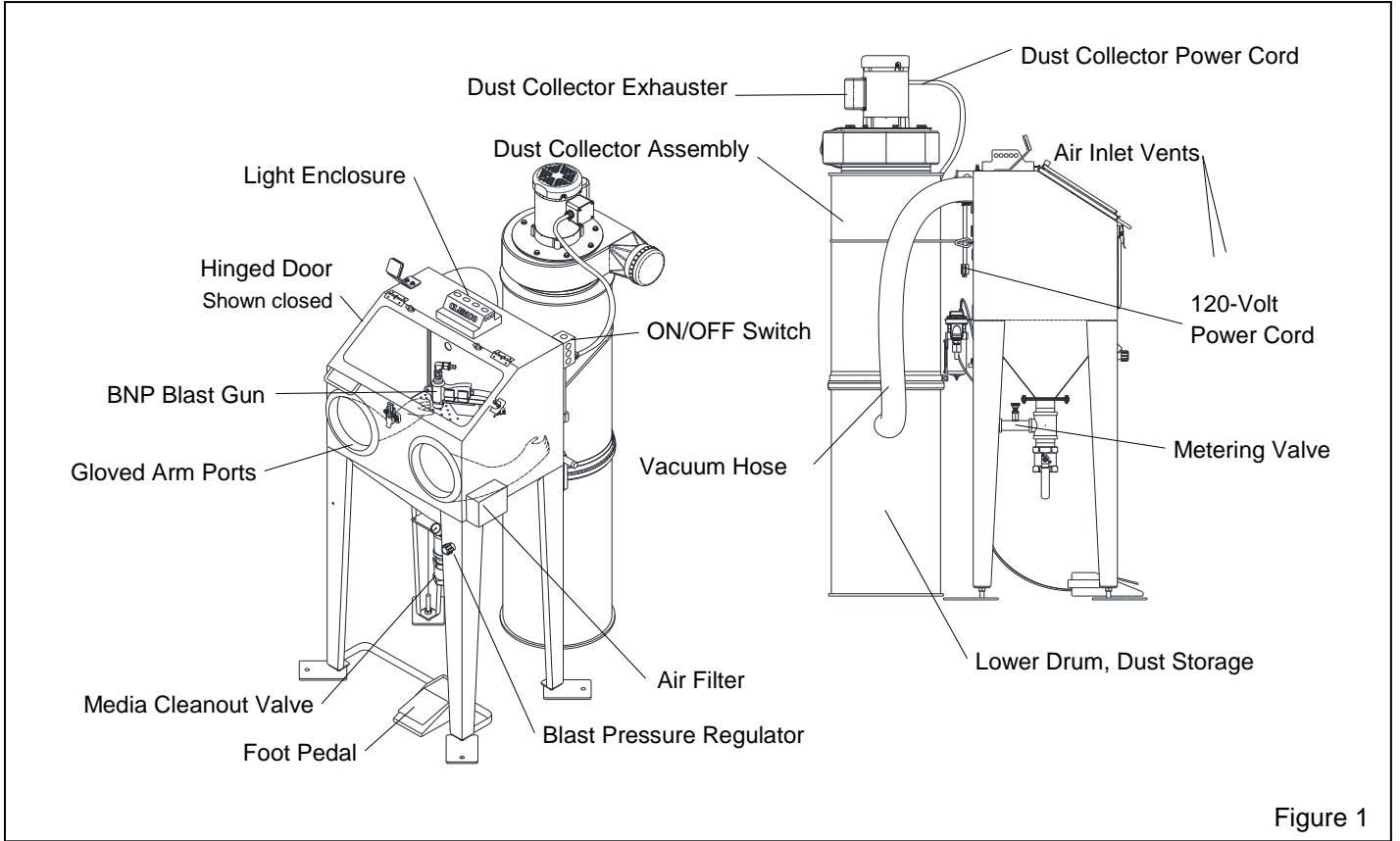


Figure 1

**1.6 Blast Gun Assembly**

1.6.1 Refer to Figure 2 for the arrangement and components of the blast gun.

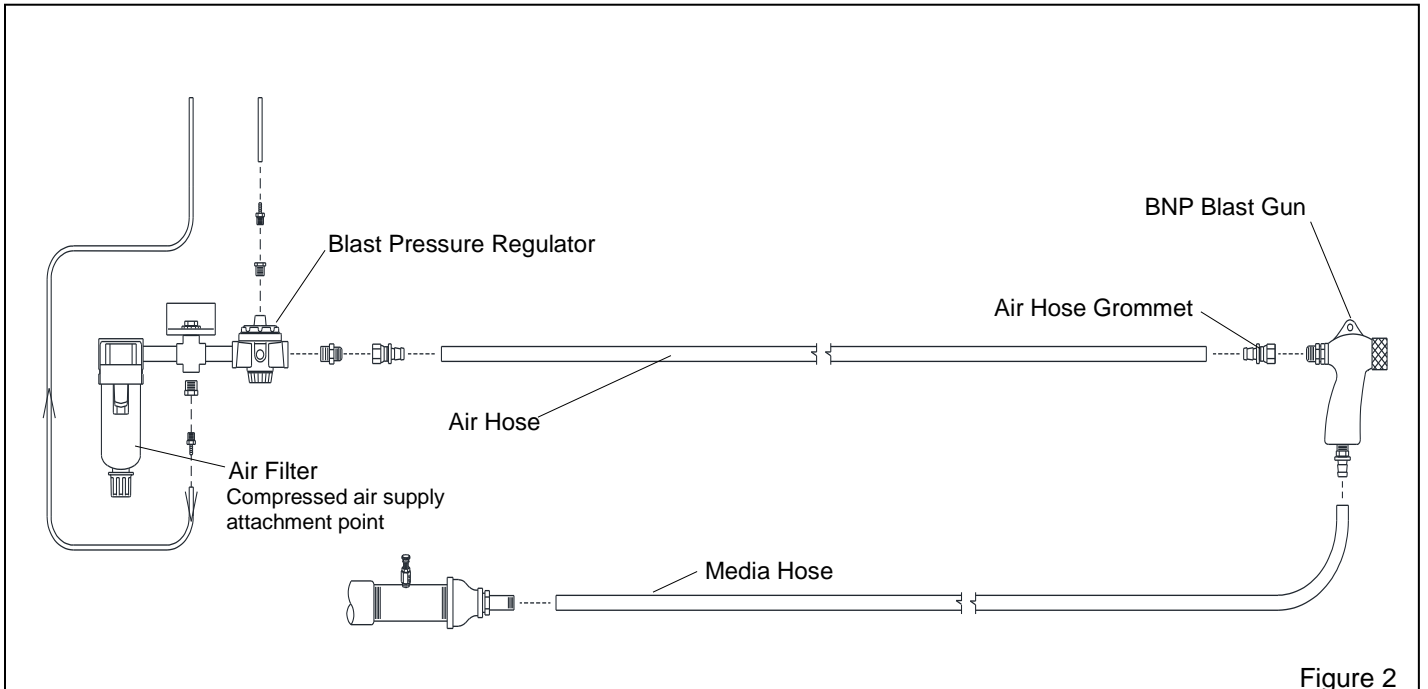


Figure 2

**1.7 Nozzle Options**

**1.7.1** The cabinet is furnished with a No. 5 (5/16" orifice) ceramic nozzle and No. 4 (1/8" orifice) air jet. A larger jet-nozzle combination, especially at higher pressures and with a dirty filter, may impair visibility or cause positive pressure within the cabinet and lead to dust leakage.

**1.7.2** Optional, more durable tungsten carbide and boron carbide nozzles are available and are shown under Section 11.2. Use boron carbide nozzles when blasting with aggressive media, as noted in Section 1.8.4.

**1.8 Media**

**1.8.1** Fortune Metal 3D Cabinets utilizes most common reusable media 18-mesh to 180-mesh, specifically manufactured for dry blasting. Media sizes shown are guidelines only, based on average conditions such as blast pressure and media friability.

Using coarser media than those recommended may result in flow problems. Media finer than those recommended may decrease visibility and increase carryover to the dust collector.

**1.8.2 Steel:** Steel grit or shot may be used. However, care must be taken to prevent ricocheting abrasive from peening the cabinet weldment.

**1.8.3 Sand and Slag:** Sand should never be used because of the respiratory hazards associated with media containing free silica. Slags are not recommended because they rapidly break down, are not recyclable, and produce excessive dust, making them unsuitable for cabinet applications.

**1.8.4 Silicon Carbide, Aluminum Oxide, and Garnet:** These are the most aggressive of the commonly used media. Aggressive media may be used, but the service life of any equipment components exposed to the media will be reduced. To avoid unscheduled downtime, periodically inspect the blast hose, nozzle and internal gun parts, and dust bag for wear.

When using aggressive media use a boron carbide lined nozzle. Nozzles lined with boron carbide extend nozzle wear life. Refer to Section 11.2, Item 9.

**1.8.5 Glass Bead:** Most beads are treated to ensure free-flow operation even under moderately high-humidity conditions. Glass beads subjected to excessive moisture may be reused after thorough drying and breaking up of any clumps.

**1.8.6 Fine-Mesh Media:** Media finer than 180-mesh could be too fine to avoid carryover. Fine media that

remains suspended after blasting could be carried over into the dust collector.

**1.8.7 Lightweight Media:** Lightweight media that remains suspended in the air could be carried over to the dust collector.

**1.8.8 Plastic Media:** Plastic and similar lightweight and/or nonaggressive media are generally not recommended for suction-style cabinets because the lower blast velocity of suction blasting combined with the softer and lighter weight media do not provide the media impact for productive blasting. Best performance from plastic media is achieved with pressure blasting, requiring a pressure vessel with a 60-degree conical bottom. Refer to Clemco's AEROLYTE cabinet line.

**1.9 Compressed-Air Requirements**

**1.9.1** The size of the compressor required to operate the cabinet depends on the size of the air jet and blasting pressure. Unless otherwise specified, cabinets are supplied with a No. 4 (1/8" orifice) jet. Refer to the table in Figure 3 for the cfm requirements at different blast pressures. Consult with a compressor supplier for suggested compressor size based on the air consumption.

Air Consumption with No. 4 BNP Gun					
Blast Pressure PSI	50	60	70	80	90
CFM	15	17	19	21	24

Figure 3

**1.9.2** The air filter at the air-inlet connection reduces condensed water from the compressed air. Its use is especially important in areas of high humidity or when using fine-mesh media. Moisture causes media to clump and inhibits free flow through the feed assembly. If the filter does not remove enough moisture to keep media dry and flowing, it may be necessary to install an air dryer or aftercooler in the air supply line.

**1.10 Electrical Requirements**

**1.10.1** Electrical requirements: 120 VAC, 1 PH, 60 Hz, with 15-amps service. The cabinet draws approximately 8 amps.

**1.10.2** A power cord with U-ground plug is supplied on the cabinet and dust collector. The dust collector cord plugs into the receptacle located on the light enclosure; no additional wiring is required. Power is supplied to the

collector when the cabinet is switched ON and shuts off when switched OFF.

**⚠ WARNING**

**Do not use electrical adaptors that eliminate the ground prong on 120-volt plugs. Doing so can cause electric shock and equipment damage.**

**2.0 INSTALLATION**

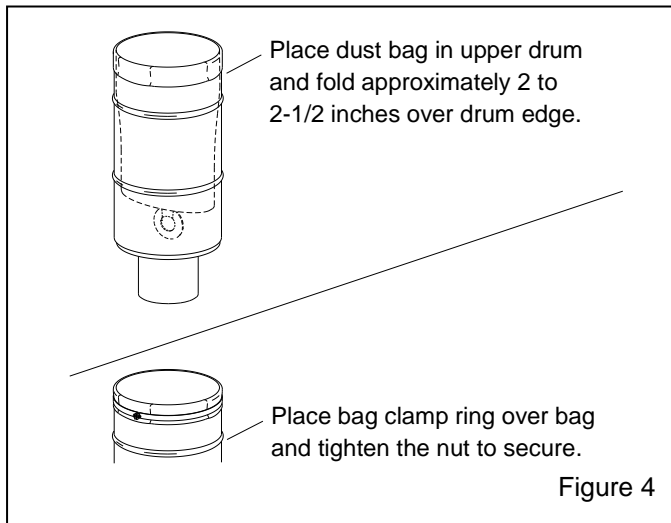
**2.1 Assembly of Loose Components**

**2.1.1 Dust Collector**

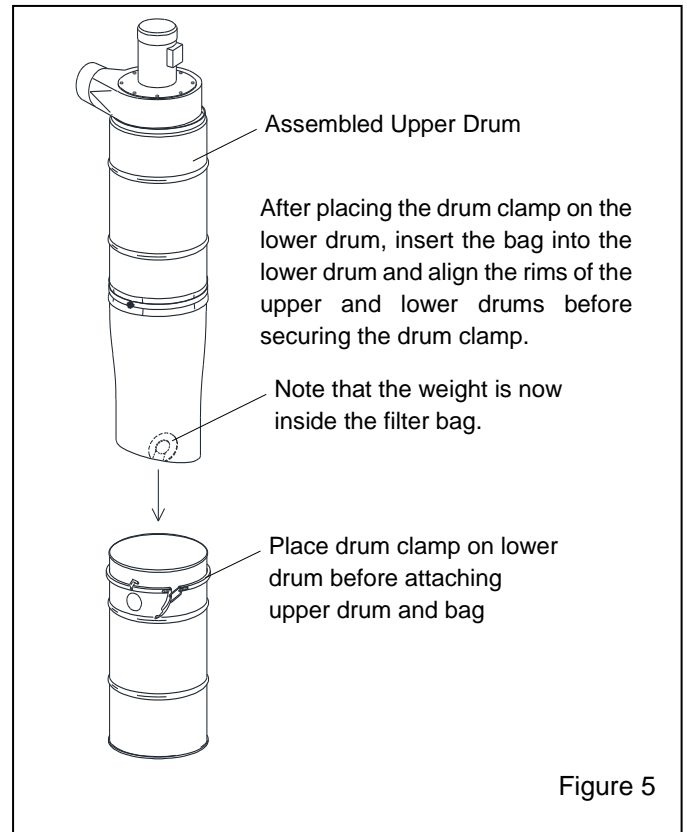
The dust collector requires the installation of the filter bag and attachment of the upper drum to the lower storage drum. To install the filter bag, proceed as follows:

**2.1.1.1** Turn the upper drum upside down and place it on a padded surface to protect the exhaustor housing.

**2.1.1.2** Insert the filter bag (weighted on the outside) into the drum and fold approximately 2" to 2-1/2" of the open end of the filter over the drum edge, as shown in the upper illustration in Figure 4.



**2.1.1.3** Place the bag clamp ring over the bag and tighten the clamp bolt to secure. **NOTE: Make sure there is enough space between the clamp ring and drum rim to attach the drum clamp and connect the upper and lower drums, as shown in Figure 6.**



**2.1.1.4** Place the lower drum on the floor and loosely place the drum clamp as shown in Figure 5.

**2.1.1.5** Place the upper drum in an upright position and insert the dust bag into the lower drum as shown in Figure 5.

**2.1.1.6** Place the upper drum onto the lower drum and align the rims.

**2.1.1.7** Place the drum clamp over the rims of the upper and lower drums and latch the clamp to secure the two drums. Assembly of the dust collector is complete.

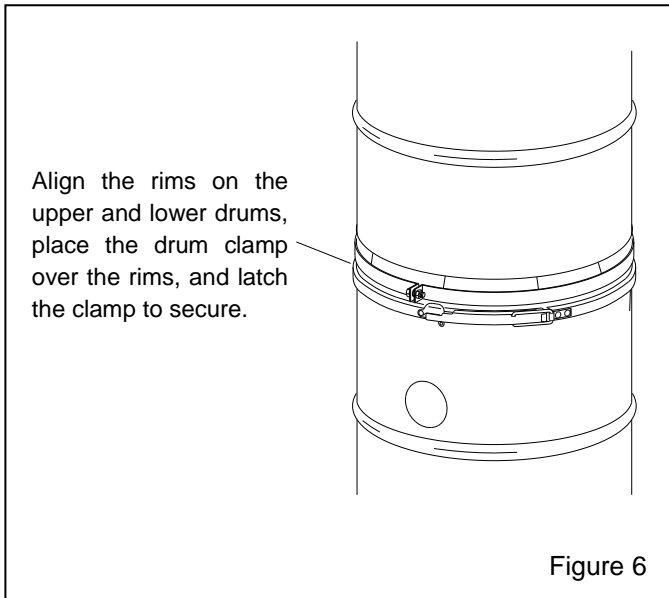


Figure 6

## 2.2 General Installation Notes

**2.2.1** Refer to Figure 1 for the general arrangement. Place all components in a convenient location where compressed air and electrical service are available. The cabinet location must comply with OSHA and local safety codes. Allow for full access to all doors and service areas, and for efficient handling of large parts. Place the dust collector behind the cabinet with hose connection toward the cabinet and with as few hose bends as possible. Provide enough clearance around the dust collector to remove the upper drum and empty the lower storage drum.

**2.2.2** If there is a possibility of small parts falling off the object being blasted, or of paint chips or other material plugging the blast gun, place an appropriately sized screen under the grate to trap that material from falling into the media.

## 2.3 Connect Compressed-Air Supply Line

### **⚠ WARNING**

**Failure to observe the following before connecting the equipment to the compressed-air source could cause serious injury or death from the sudden release of compressed air.**

- **Lock out and tag out the compressed-air supply.**
- **Bleed the compressed-air supply line.**

### **⚠ WARNING**

**Hose disconnection while under pressure can cause serious injury or death. Use safety lock pins or safety wire to lock twist-on couplings together and prevent accidental separation, and also use safety cables to prevent hose from whipping should separation occur. Safety lock pins and safety cables are listed in Section 11.1: Optional Accessories.**

**2.3.1** Install an isolation valve and bleed-off valve where the air supply is tapped into the compressed-air system. This enables depressurization of the compressed-air line before performing maintenance.

**2.3.2** Refer to Figure 7. Apply thread sealant to the male threads of an air fitting that is compatible with the air-supply hose fitting, and install it onto the 1/2-NPT air filter located on the back of the cabinet. If preferred, slip a short length of 1/4" tubing in to the filter's drain barb to direct drain water into a container. **Note: The style of connection shown in Figure 7 is for reference only.**

**2.3.3** The recommended minimum ID of compressed-air supply hose to the cabinet is 1/2" ID; use 3/4" ID if the line is longer than 25 ft. A smaller diameter hose may reduce blasting efficiency.

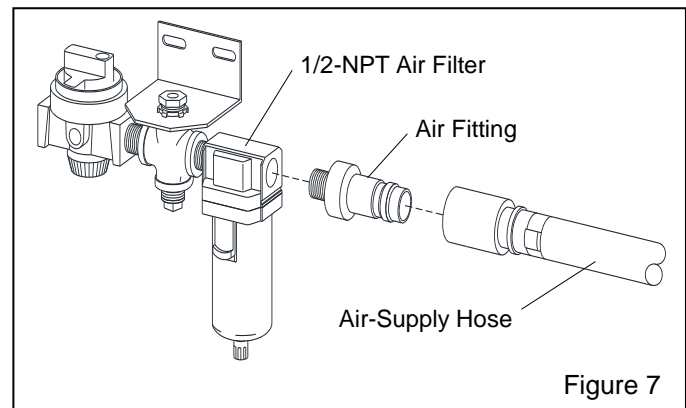


Figure 7

**2.3.4** Connect the air line from the air source to the air filter inlet.

## 2.4 Ground the Cabinet

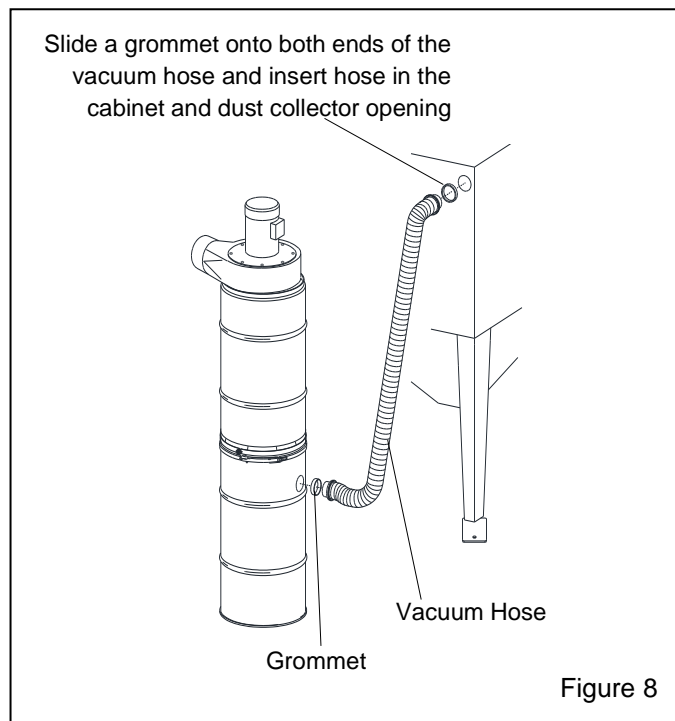
**2.4.1** To prevent static electricity buildup, attach an external grounded wire from an earth ground to the grounding bolt on the right-rear cabinet leg.

**2.5 Cabinet and Dust Collector Placement**

2.5.1 Place the dust collector at a convenient location at the back of the cabinet.

**2.6 Connect Vacuum Hose**

2.6.1 Make sure a vacuum hose grommet is installed on both ends of the vacuum hose and insert the hose into the opening in the back of the cabinet and side of the dust collector, as shown in Figure 8.



**2.7 Connect Electrical Service**

2.7.1 The cabinet and dust collector are supplied with a U-ground plug. Plug the dust-collector cord into the socket below the ON/OFF switch located on the light enclosure and plug the cabinet cord into a 115-volt outlet.

**⚠ WARNING**

**Do not use electrical adaptors that eliminate the ground prong on 115-volt plugs. Doing so could cause electric shock and equipment damage.**

**2.8 Foot Pedal Positioning**

2.8.1 Position the foot pedal on the floor at the front of the cabinet.

**3.0 INITIAL TESTS**

3.1 Make sure the hopper is free of any packing, debris, or other materials.

3.2 Slowly open the air-supply valve to the cabinet, and listen for leaks or open lines. Shut off the valve immediately if any major leak is heard.

3.3 Check all fittings for air leaks. Shut off the air supply and correct any leaks that are found.

3.4 Adjust the pressure regulator on the front of the cabinet hopper to 80 psi, per Section 7.1.

3.5 Start the dust-collector exhaustor motor by placing the switch in the back of the cabinet to the ON position. When the dust-collector cord is plugged into the socket below the switch, the switch operates both the lights and dust-collector motor. Both should start when the switch is ON.

3.6 Insert hands into rubber gloves and grasp the BNP Blast Gun.

3.7 Step on the foot pedal and apply pressure to depress the pedal. NOTE: Blasting will start immediately. When satisfied the cabinet and dust collector are operational, release pressure on the foot pedal to stop blasting. Proceed to Section 4.

**4.0 MEDIA LOADING AND UNLOADING**

**4.1 Media Loading**

4.1.1 Pour approximately 15 lbs of clean, dry media or 30 lbs of metallic media through the grate into the cabinet hopper.

4.1.2 Do not overfill; overfilling may cause media to pack around the inlet of the metering valve (especially finer-mesh media) and impede media flow.

**4.2 Media Unloading**

4.2.1 Empty the cabinet of spent media by placing an empty, suitable disposal container under the media dump valve and open the valve. Media will flow through the valve until the cabinet is empty or until the operator closes the valve. The valve is closed when the handle is in the horizontal position.

NOTE: Blasting media is usually nontoxic; however, some materials removed by blasting may have disposal restrictions. Obtain safety data sheets (SDSs) for media



and identify all material removed by the blast process. Check with proper authorities for disposal restrictions.

**4.3 Purging the Cabinet of Spent Media.** When changing from one type of media to another, especially when changing from an aggressive media such as aluminum oxide or steel to a softer media such as glass bead, total purging may be needed.

**4.3.1** Unload spent media, per Section 4.2. When the cabinet is empty, close the media dump valve and press the foot pedal. Blow down the inside of the cabinet to remove media and dust clinging to the walls and in corners. Open the cleanout to empty and repeat the process if needed. If total purging is required to prevent contaminating parts, remove the vacuum hose from the back of the cabinet, start the dust collector, and use the hose to vacuum the inside of the cabinet.

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## 5.0 LOADING AND UNLOADING PARTS

- 5.1 Load and unload parts through the hinged door.
- 5.2 Parts must be free of oil, water, grease, or other contaminants that will cause media to clump or clog filters.
- 5.3 When blasting small parts, place an appropriately sized screen over the grate (or under the grate when frequently blasting small parts) to prevent parts from falling into the hopper.
- 5.4 Close and latch the door securely.

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## 6.0 BLASTING OPERATION

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### CAUTION

- Do not operate the foot pedal unless all doors are closed and securely latched.
  - Always use blast gloves.
  - Avoid pointing the blast nozzle toward the view window.
  - Keep all doors closed during blasting.
  - After blasting, keep doors closed and exhauster running until the cabinet is clear of all airborne dust.
  - Stop blasting immediately if dust leaks are detected.
- 

**6.1** Slowly open the air valve on the air supply hose to the cabinet. Check for air leaks on the initial startup and periodically thereafter.

**6.2** Turn ON the lights and exhauster. The ON/OFF switch performs both functions.

**6.3** Load parts.

**6.4** Close door and latch securely

**6.5** Insert hands into rubber gloves.

**6.6** To blast, hold the gun firmly, point the gun only at parts to be blasted, and apply pressure to the foot pedal; blasting begins immediately.

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### WARNING

**Shut down the cabinet immediately if dust discharges from the dust collector or cabinet. Make sure the dust collector filter is correctly installed and not worn or damaged. Prolonged breathing of any dust could result in serious lung disease or death.**

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## 6.7 Adjust Blast Pressure

**6.7.1** Adjust blast pressure, per Section 7.1.

NOTE: When blasting parts off the grate, use a solid conductive backrest to support the part. Without this assist, static electricity could build up in the ungrounded part and cause static shocks. Whenever possible, avoid holding small parts that require blasting into the glove.

## 6.8 Blasting Small Parts

**6.8.1** When blasting small parts, place an appropriately sized screen over the grate (or under the grate when frequently blasting small parts) to prevent parts from falling into the hopper. If an object should fall through the grate, stop blasting immediately and retrieve it.

## 6.9 Stop Blasting

**6.9.1** To stop blasting, remove pressure from the foot pedal.

**6.9.2** Keep door closed and exhauster running until the cabinet is clear of all airborne dust.

**6.10 Unload Parts**

**6.10.1** Shut off the air-supply valve, drain the air filter, and switch OFF the lights and exhauster.

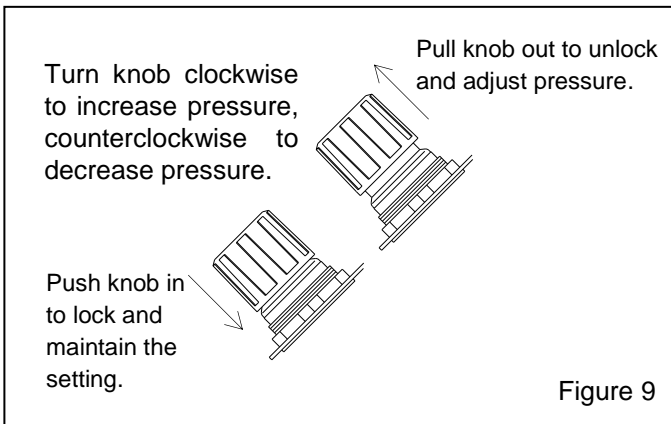
**6.11 Blasting Technique**

**6.11.1** Blasting technique is similar to spray painting technique. Smooth, continuous strokes are most effective. The distance from the part affects size of blast pattern. Under normal conditions, hold the nozzle approximately 3" to 6" from the surface of the part.

**7.0 ADJUSTMENTS**

**7.1 Blasting Pressure – Figure 9**

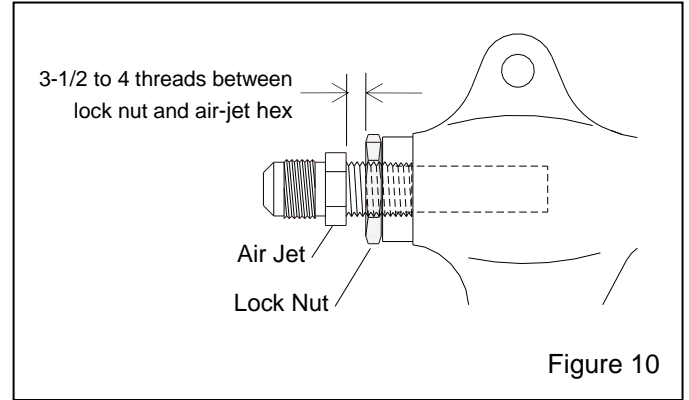
**7.1.1** The pressure regulator located on the front leg of the cabinet enables the user to adjust blasting pressure to suit the application. The suitable pressure for most purposes is 80 psi. Lower pressures may be required on delicate substrates and reduce media breakdown. Higher pressure may be required for difficult blasting jobs on durable substrates, but they increase media break down. If pressure is too high, suction in media hose will decrease, and if high enough, cause blowback in the hose. In all cases, optimal production can only be achieved when pressure is carefully monitored.



**7.1.2** To adjust, unlock the knob by pulling it out as shown in Figure 9, and turn it clockwise to increase pressure or counterclockwise to decrease pressure. Pressure will usually drop from closed-line pressure when blasting starts. After operating pressure is set, lock the knob to maintain the setting.

**7.2 Air-Jet Adjustment – Figure 10**

**7.2.1** Thread the air jet 4-1/2 to 5 full turns into the gun body. Doing so will leave 3-1/2 to 4 threads exposed past the lock nut. Tighten the lock nut to hold the jet in place. Refer to Section 11.2, Item 12 for optional adjusting tool, which correctly positions the jet.



**7.3 Door Interlocks – Figure 11**

**WARNING**

**Never bypass the door interlock system. Doing so can result in serious injury from unexpected blasting.**

**7.3.1** The door interlock disables the blasting control circuit when the door is open. To enable blasting, the door-interlock switch must be engaged when door is closed. The interlock is set at the factory and does not normally require field adjustment unless parts are replaced. When adjustment is required, proceed as follows.

**7.3.2** Close cabinet door.

**7.3.3** Turn the adjusting screw in or out as required to engage the switch without applying excessive pressure on it. Tighten the adjusting screw nuts.

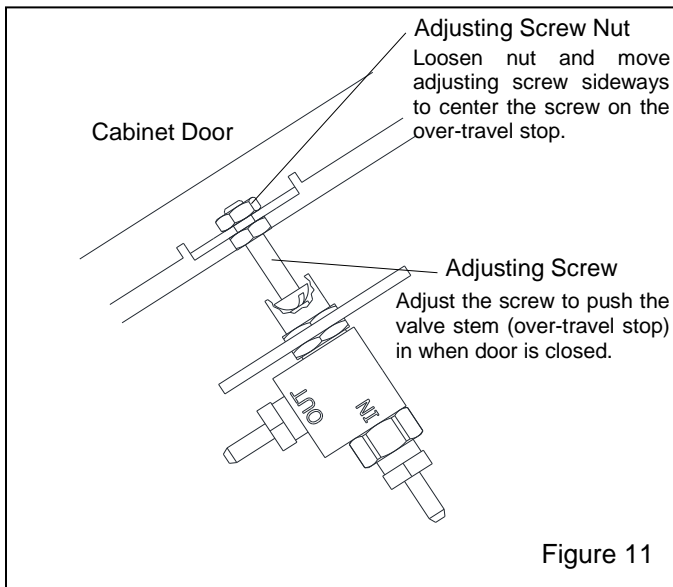


Figure 11

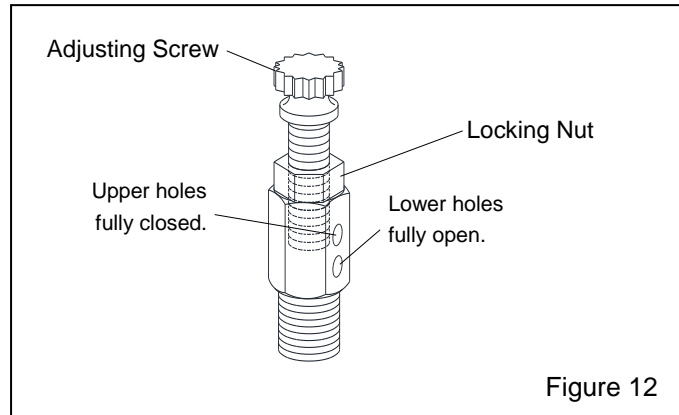


Figure 12

**7.3.5** Test the operation with the door open and then closed. Negative pressure inside the cabinet may cause the door to flex inward. Tests should be performed with the exhauster running. Point the nozzle away from the door during the tests and open the door only enough to disengage the interlock switch. The interlock should stop the blasting when the door is open and permit blasting when the door is closed.

**7.4 Metering Valve Adjustment – Figure 12**

**7.4.1** While blasting, check the media stream through the blast nozzle or through the clear metering valve tube. With the correct media-air mixture, media will flow smoothly through the tube and nozzle.

**7.4.2** If media does not flow smoothly, loosen the locking nut, and adjust the metering screw until the upper holes in the metering stem are closed-off and the lower holes are fully open. See Figure 12. This adjustment is a starting point.

**7.4.3** If pulsation occurs in the media hose, either media is damp and caked, or not enough air is entering the media stream. While blasting, loosen the locking nut and slowly turn the adjusting screw out (counterclockwise when viewed from the top) until the media flows smoothly. Tighten the locking nut finger-tight to maintain the setting.

**7.4.4** If media flow is too light, decrease air in the mixture by turning the metering screw in (clockwise when viewed from the top) covering more of the holes so less air enters the media hose. Tighten the locking nut finger-tight to maintain the setting.

**8.0 PREVENTIVE MAINTENANCE**

NOTE: To avoid unscheduled downtime, establish a weekly inspection schedule. Inspect all parts subjected to media contact, including the gun, nozzle, media hose, flex hose, and wear plate, plus all items covered in this section.

**8.1 Nozzle, Refer to Section 9.2**

**8.1.1** Remove the nozzle nut, nozzle, and O-ring and then inspect the nozzle for wear. Replace the nozzle when its diameter has increased by 1/16", or when suction diminishes noticeably.

**8.1.2** Inspect internal parts of the BNP gun for wear. Inspection and replacement of the air-jet cover before it wears through prolongs the life of the jet.

**8.2 Media Hose**

**8.2.1** To avoid unscheduled downtime, periodically inspect the media hose for thin spots by pinching it every 6 to 12 inches.

**8.3 View-Window Cover Lens**

**8.3.1** Inspect the window cover lens. Replace as needed, per Section 9.3.

**8.4 Compressed-Air Filter**

**8.4.1** The cabinet is equipped with a manual-drain air filter located on the front of the cabinet hopper just ahead of the pressure regulator. Drain the filter at least once a day, and more often if water is present. Moist air inhibits the flow of media. If desirable, slip a short length of 1/4" tubing over the drain barb to direct drain water into a container. Drain the air line and receiver tank regularly. If the filter does not remove enough moisture to keep media dry and flowing, it may be necessary to install an air dryer or aftercooler in the compressed-air supply line.

**8.5 Dust Collector**

**⚠ WARNING**

**Prior to doing any maintenance or opening the dust collector, the employer must meet OSHA standards required but not limited to 29CFR 1910 for:**

- **Appropriate Respirator**
- **Protective Clothing**
- **Toxic and Hazardous Substances**

**Toxicity and health risk vary with type of dust generated by blasting. Identify all material that is being removed by blasting and obtain a safety data sheet (SDS) for the blast media. Waste dust in the collector can cause serious injury or death through inhalation, absorption, or consumption.**

**8.5.1** Empty the dust drum regularly. Begin by checking the drum daily and adjust frequency based on usage and breakdown rate of media. Do not allow more than 2" to 3" to collect in the bottom of the drum.

NOTE: Obtain safety data sheets (SDS) for the media and identify all material removed by the blast process. Check with proper authorities for disposal restrictions.

**8.5.2** Dust collects in the lower drum. To empty the dust drum:

1. Unplug the cord from the cabinet light enclosure.
2. Unlatch the drum clamp and remove the upper section from the lower drum.
3. Dump the contents into a suitable disposal container. **Check with proper authorities for disposal restrictions.**
4. Reassemble the upper and lower drums and latch securely. Plug cord into cabinet light enclosure.

**8.5.3** Replace the filter bag at least every four months.

- Replace bag sooner if blasting conditions have saturated the bag and prevent adequate air movement through the cabinet.

- Replace damaged filters immediately if dust is seen coming from the exhauster. Refer to Section 9.8 to replace the bag.

**9.0 SERVICE MAINTENANCE**

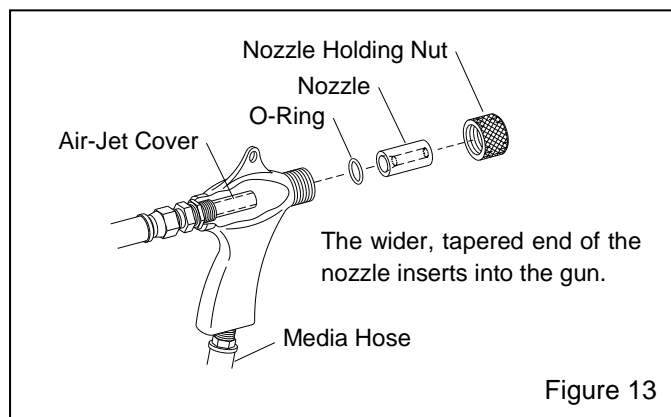
**9.1 Gloves**

**9.1.1** Special static-dissipating gloves are provided for operator comfort. It will be necessary to change gloves periodically as they wear. The first sign of deterioration may be excessive static shocks.

**9.1.2 Band-clamp type:** Band-clamp type gloves are held in place by metal band clamps on the inside of the cabinet. To replace, loosen the clamps with a screwdriver, replace the gloves, and tighten the clamps.

**9.1.3 Quick-change type, clampless installation:** Quick-change gloves are held in place using spring rings sewn into the attachment end of the glove. To install, insert the glove into the arm port so one spring is on the inside of the port and the other is on the outside, sandwiching the arm port between both spring rings.

**9.2 BNP Gun Assembly – Figure 13**



**9.2.1** Replace the nozzle when its diameter has increased by 1/16" or when suction diminishes noticeably. To change the nozzle, unscrew the holding nut from the gun end and pull the nozzle from the gun. Inspect the nozzle O-ring and replace if worn or damaged. Insert a new nozzle, placing the tapered end toward the jet. Screw the holding nut onto the gun.

**9.3 View-Window Cover Lens**

**9.3.1** Rapid frosting of the view window can be avoided by directing ricocheting media away from the window and by installing a cover lens on the inside surface of the window. Using cover lenses prolongs the life of the view window.

**9.3.2** The best way to install a cover lens is to remove the window from the cabinet. If, for some reason, it is not practical to remove the window, the lens may be applied with the window glass in place.

**9.3.3** To install a cover lens, carefully remove the adhesive backing making sure the adhesive remains on the lens and apply the lens to the clean, dry, inner surface of the view window. When the cover lens becomes pitted or frosted, replace it.

**9.4 View-Window Replacement**

**⚠ WARNING**

**Do not use plate glass for replacement view windows. Plate glass shatters on impact and can cause severe injury. Use only genuine ZERO® laminated replacement glass.**

**9.4.1** Remove the two window frame nuts located on the upper edge of the window frame and swing the window frame open. If the frame is to remain open for cleaning or other reasons, remove it, per Section 9.6.

**9.4.2** Remove the old window.

**9.4.3** Inspect the window-frame gaskets, both on the window frame and on the cabinet. If either gasket is damaged, replace it, per Section 9.5.

**9.4.4** Install a view-window cover lens, per Section 9.3.

**9.4.5** Set the new window (cover lens down) squarely over the window opening, making sure that all edges of the window are centered and overlapping the window gasket, and that the window is resting on the window support tabs.

**9.4.6** Swing the window frame into place and tighten the frame nuts.

**9.5 Window-Gasket Replacement – Figure 14**

**9.5.1** Inspect the gaskets when changing the view window. Replace the window-frame gasket and cabinet-window-opening gasket at the first sign of media leakage

around the view window, or if gaskets are worn or otherwise damaged.

**9.5.2** Remove the window and window frame, per Section 9.6.

**9.5.3** Remove all the old gasket material and clean the surfaces of the cabinet and window frame.

**9.5.4** Peel a short section of adhesive backing from the 5/16"-thick strip gasket and adhere the gasket to the center of the top edge of the window opening, as shown in Figure 14. Peel additional backing as needed and work the strip around the radius of each corner, pressing it firmly to bond. Trim the gasket to fit and compress the ends to seal.

**9.5.5** Using 5/32"-thick strip gasket, repeat the process on the underside of the window frame.

**9.5.6** Trim around the window-frame bolt slots, as needed.

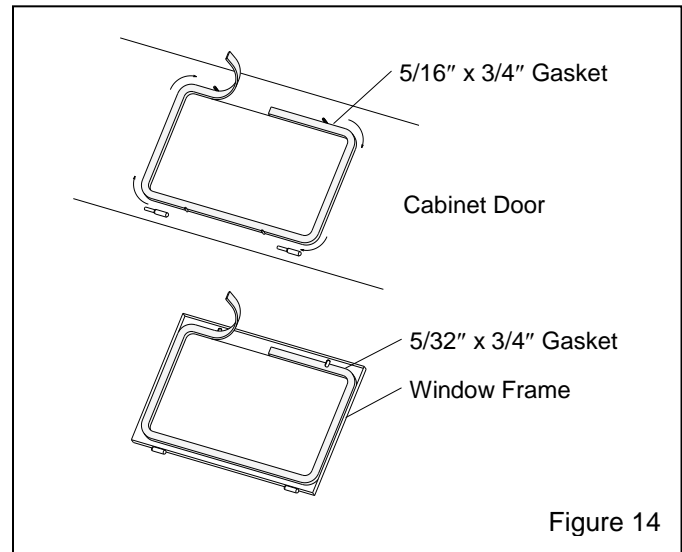


Figure 14

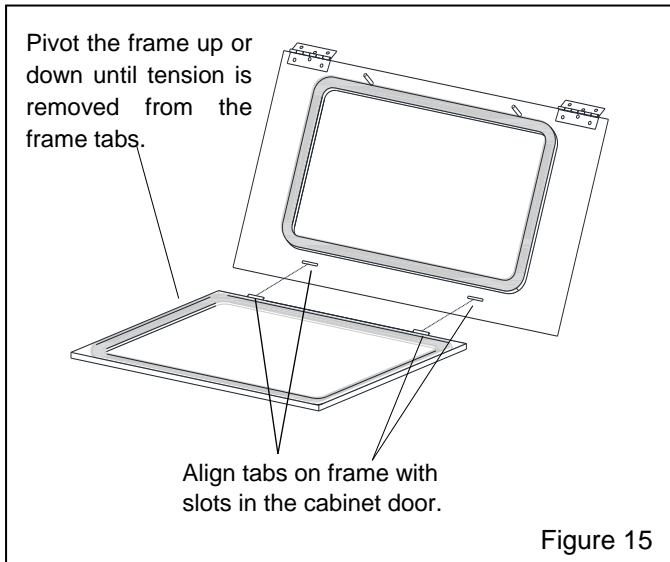
**9.6 Window-Frame Removal – Figure 15**

**9.6.1** Remove the two window-frame nuts located on the upper edge of the window frame and swing the window frame open.

**9.6.2** Remove the window to prevent breakage.

**9.6.3** Pivot the window frame up or down until tension is off the frame tabs.

**9.6.4** To remove, pull the frame out of the slots, as shown in Figure 16.



**9.6.5** Replace the frame in reverse order. Align the top bolt holes with the bolts; slide the frame as necessary.

**9.6.6** Set the window squarely over the window opening. Make sure that all edges of the window are centered and overlapping the window gasket, and that the window is resting on the window support tabs.

**9.6.7** Swing the window frame into place and tighten the frame nuts.

**9.7 LED Light Assembly – Figure 16**

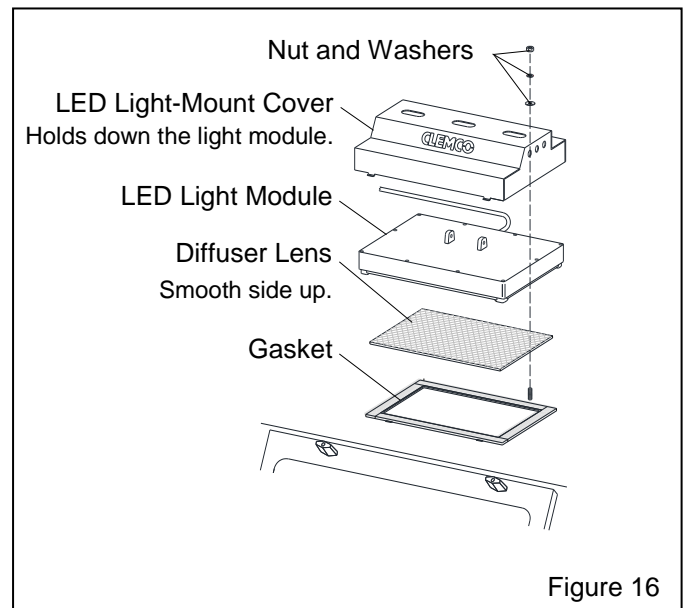
**⚠ WARNING**

**Use an approved stepladder when servicing the light assembly. Do not climb on top of the cabinet. The cabinet top will not support the weight of a person. Failure can result in injury and property damage.**

**9.7.1 Remove light-mount cover**

**9.7.1.1** Turn OFF electrical power.

**9.7.1.2** Remove the four nuts and washers that attach the light-mount cover to the cabinet and remove the cover, as shown in Figure 16.



**9.7.2 Gasket replacement**

**9.7.2.1** Remove the four nuts and washers that attach the light-mount cover to the cabinet and remove the cover, as noted in Section 9.7.1. Move the light module off the diffuser lens and remove the lens.

**9.7.2.2** Remove all the old gasket material and clean the surface of the cabinet.

**9.7.2.3** Lay a section of strip gasket along the edge of the opening and cut to length, allowing 3/4" overlap on each end. Peel a short section of adhesive backing and adhere the strip gasket to the top edge of the light opening, as shown in Figure 16. Press the gasket to bond. Repeat the process for each side, compressing the ends to seal.

**9.7.3 Diffuser-lens replacement**

**9.7.3.1** Remove the four nuts and washers that attach the light-mount cover to the cabinet and remove the cover, as noted in Section 9.7.1. Move the light module off the diffuser lens and remove the lens. Inspect the gasket. Replace it if it is compressed or otherwise damaged, per Section 9.7.2, before centering the new diffuser (smooth side up) over the gasket.

**9.7.3.2** Set the light module on the diffuser and reattach the cover.

**9.7.4 LED light-module replacement**

**9.7.4.1** Turn OFF electrical power and perform lockout and tagout procedure to power supply.

**9.7.4.2** Remove the light-mount cover, per Section 9.7.1.

9.7.4.3 Remove the junction-box cover and note the wire connections. Current connections are as follows:

- Brown wire ..... Hot
- Blue wire ..... Neutral
- Yellow w/green stripe ..... Ground

If color coding is different from that shown above, make note of the color code before disconnecting the wires.

9.7.4.4 Loosen the strain-relief compression nut and remove the cord from the junction box.

9.7.4.5 Place the new module in position on the cabinet and route the cord through the strain relief and into the junction box.

9.7.4.6 Cut the cord to length and wire as follows:

- Brown wire ..... Hot
- Blue wire ..... Neutral
- Yellow w/green stripe ..... Ground

9.7.4.7 Apply power to test the light.

9.7.4.8 Tighten the strain-relief compression nut, set the light module on the diffuser, and reattach the cover.

**9.8 Filter-Bag Replacement, Figure 17**

**Replace damaged filters immediately if dust is seen coming from the exhauster.**

9.8.1 Unplug dust collector power cord from cabinet light enclosure.

9.8.2 Remove the vacuum hose from lower dust-collector drum.

9.8.3 Loosen the bolt securing the bag clamp to the upper drum, slide the bag clamp up off the bag, and loosen the bag from the rim on the upper drum, as noted in Figure 17. Doing so loosens the bag from the upper drum assembly and keeps the old bag in the lower dust-storage drum.

9.8.4 Unlatch the drum clamp and remove the upper-drum assembly, keeping the old bag in the lower drum.

9.8.5 Remove the upper-drum assembly and place it upside down on a padded surface.

9.8.6 Dump the contents of the lower drum, including the bag, into a suitable disposal container. **Check with proper authorities for disposal restrictions.**

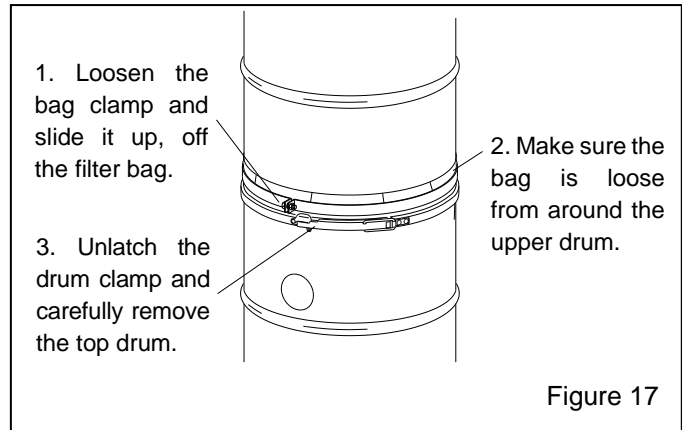


Figure 17

9.8.7 Inspect the inside of the upper drum assembly and wipe off any dust residue with a damp cloth until clean.

9.8.8 Insert a new filter bag (weighted on the outside) into the drum and fold approximately 2" to 2-1/2" of the open end of the filter over the drum edge, as shown in the upper illustration in Figure 18.

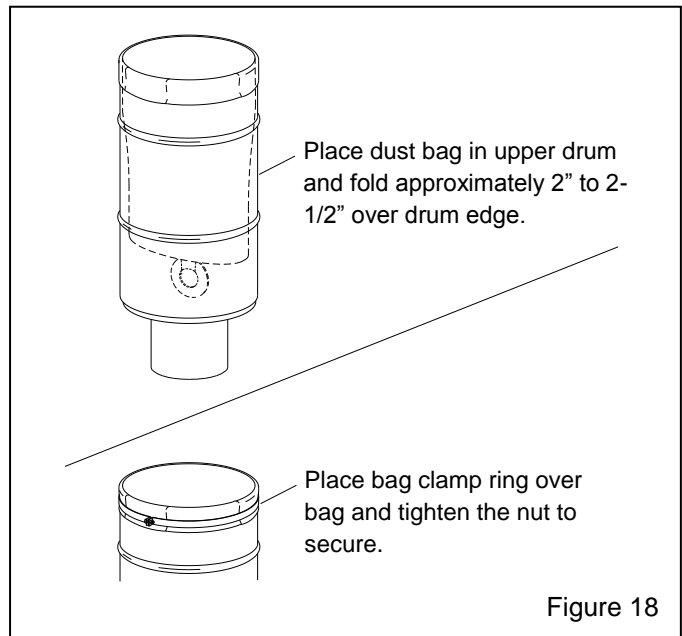


Figure 18

9.8.9 Place the bag clamp ring over the bag and tighten the clamp bolt to secure. **NOTE: Make sure there is enough space between the clamp ring and drum rim to attach the drum clamp and connect the upper and lower drums, as shown in Figure 20.**

9.8.10 Place the lower drum on the floor and loosely place the drum clamp, as shown in Figure 19.

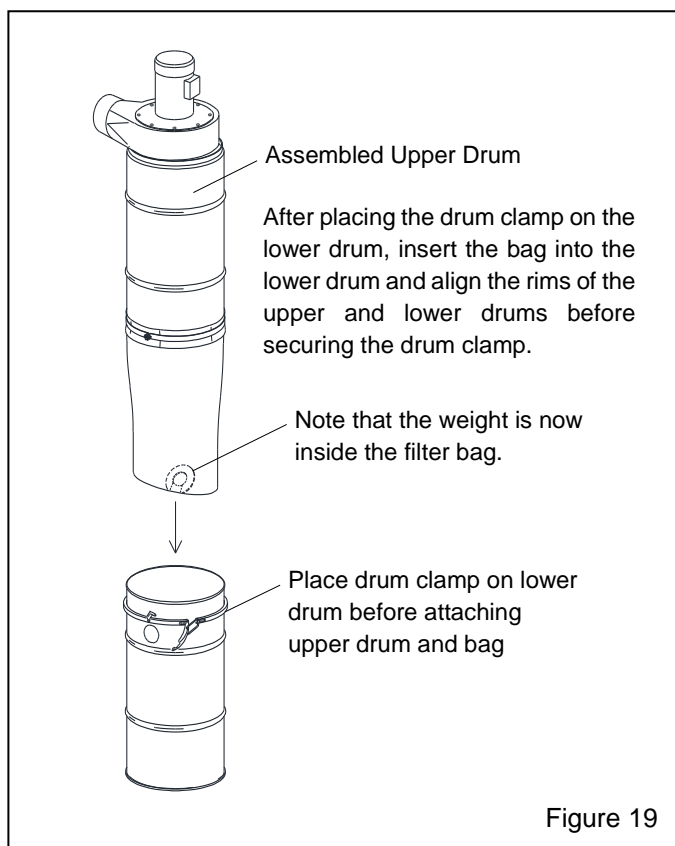


Figure 19

**9.8.11** Refer to Figure 20 and align the rims on the upper and lower drums, place the drum clamp over the rims, and latch the clamp to secure

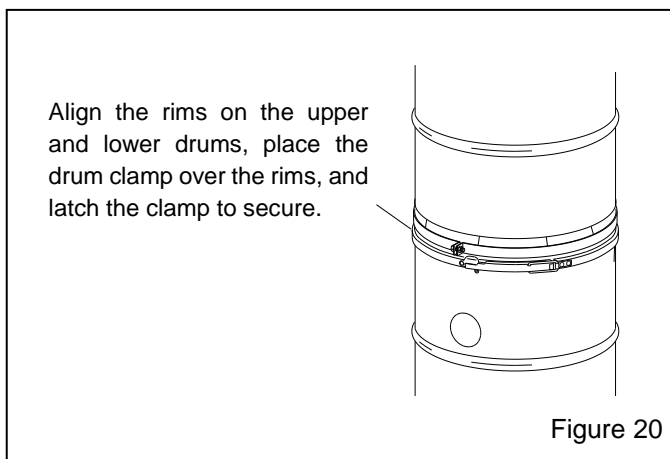


Figure 20

**9.8.12** Replace the vacuum hose and plug the power cord into the light enclosure.

10.0 TROUBLESHOOTING

**⚠ WARNING**

To avoid serious injury, observe the following when troubleshooting:

- Turn OFF the air, and lock out and tag out the air supply.
- If checking the controls requires air, always enlist the aid of another person to:
  - Hold the blast gun securely.
  - Operate the foot pedal.
- Never bypass the foot pedal or wedge it in the operating position.

10.1 Poor Visibility

**10.1.1** Dirty filter bag. Replace the filter bag at least every four months. Replace bag sooner if blasting conditions have saturated the bag and prevent adequate air movement through the cabinet.

**10.1.2** Using friable media that rapidly breaks down, or using media that is too fine or worn out.

**10.1.3** Air-inlet vents blocked restricting air movement through the cabinet. Check air vents for any obstructions.

**10.1.4** Leak in vacuum hose. Inspect hose and grommets for leaks

**10.1.5** Blockage in vacuum hose. Inspect filter bag.

10.2 Abnormally-High Media Consumption

**10.2.1** Media may be too fine or worn-out.

**10.2.2** Using friable media that rapidly breaks down.

**10.2.3** Blast pressure too high for the media, causing media to break down.

10.3 Reduction in Blast Cleaning Rate

**10.3.1** Low media level reducing media flow. Check media level and replenish or replace, as needed.

**10.3.2** Reduced air pressure. This may be caused by a malfunctioning regulator, a dirty filter element in the air filter, partially closed air valve, leaking air line, or other air tools in use.

**10.3.3** Blockage in media hose or gun. Blockage may occur as a result of media in the air-induction tube. Make sure the tube is clear of media.



**10.3.4** Worn gun parts such as nozzle or air jet. Inspect and replace all worn parts.

**10.3.5** Worn media hose. Check hose for leaks and soft spots. Replace worn or damaged hose.

**10.3.6** Air jet in gun out of adjustment. Check adjustment, per Section 7.2.

**10.3.7** Moist media. Frequent bridging or blockage in the area of the suction pipe or gun can be caused by moisture. Refer to Section 10.5.

#### **10.4 Plugged Nozzle**

**10.4.1** Inspect inside of gun for blockage.

**10.4.2** Place an appropriately sized screen under the grate to trap foreign material from falling into the media.

#### **10.5 Media Bridging**

**10.5.1** Frequent bridging of media can be caused by damp media. Media becomes damp by blasting parts that are slightly oily, from moisture in the compressed-air line, or from absorption from ambient air.

**10.5.2** To avoid contaminating media from the workpiece, all parts put into the cabinet should be clean and dry. If parts are oily or greasy, degrease and dry them prior to blasting.

**10.5.3** Moist, compressed air may be caused by a faulty compressor that overheats or pumps oil/moisture into the air line, too long of an air line permitting moisture to condense on the inside, or from high humidity. Drain the air filter and receiver tank regularly. Ongoing problems with moist air may require the installation of an air dryer or aftercooler in the air-supply line.

**10.5.4** Absorption. Some media tends to absorb moisture from the air, especially fine-mesh media in areas of high humidity. Empty the media and store it in an airtight container when cabinet is not in use.

#### **10.6 Blasting Does Not Begin When the Foot Pedal Is Pressed**

**10.6.1** Pressure regulator may be set too low or OFF. Check pressure on pilot regulator.

**10.6.2** Make sure that the air compressor is operating and air-supply valves are open.

**10.6.3** Check the nozzle to see if it is plugged. Refer to Section 10.4.

**10.6.4** Foot pedal valve malfunction. Check operation of valve.

#### **10.7 Blockage in Media Hose**

**10.7.1** Wet or damp media. Refer to Section 10.5.

#### **10.8 Poor Suction in Media Hose**

**10.8.1** Inadequate air supply. Refer to Section 1.9.

**10.8.2** Air jet needs adjustment. Check adjustment per Section 7.2.

**10.8.3** Nozzle worn. Replace if worn 1/16" or more.

**10.8.4** Blockage in media hose or nozzle. Refer to Sections 10.4 and 10.5.

**10.8.5** Air-jet sleeve extends past end of air jet. Cut the sleeve to align with the air jet.

**10.8.6** Blast pressure too high. Refer to Section 7.1.

**10.8.7** Nozzle inserted backward; the wider, tapered end of the nozzle inserts into the gun, toward the air jet.

#### **10.9 Air Only (no abrasive) from Nozzle**

**10.9.1** Make sure the air hose and media hose are not reversed on the gun; the green air hose attaches to the back of the gun, and the clear media hose attaches to the bottom of the gun's grip. Refer to Figure 21.

#### **10.10 Blowback through Media Hose**

**10.10.1** Blockage in nozzle. Remove the nozzle and check for blockage.

**10.10.2** Blast pressure too high. Refer to Section 7.1.

#### **10.11 Static Shocks**

**10.11.1** Cabinet and/or operator not grounded. Abrasive blasting generates static electricity. The cabinet must be earth-grounded to prevent static buildup. Refer to Section 2.4. If shocks persist, the operator may be building up static. Attach a small ground wire, such as a wrist strap, from the operator to the cabinet.

10.11.2 Avoid holding parts off the grate. Static builds up in the part if not dissipated through the metal cabinet.

**10.12 Dust Leaking from Dust Collector**

10.12.1 Damaged filter bag. Inspect filter and replace as needed.

**11.0 ACCESSORIES AND REPLACEMENT PARTS**

**11.1 Optional Accessories**

**Additional Accessories**

- Lock pins (pkg. of 25)  
for twist-on air hose couplings ..... 11203
- Safety cable, for 1/2" to 1-1/4" OD hose ..... 15012

**11.2 BNP® Gun and Hose Assembly – Figure 21**

Item	Description	Stock No.
(-)	BNP Gun assemblies less nozzle, includes items 1 (brass) through 7	
	No. 4 Gun .....	12301
	No. 5 Gun .....	12302
1.	Nut, nozzle holding Standard, knurled brass .....	11914
	Urethane covered .....	11574
2.	O-ring .....	08975
3.	Gun body .....	11802
4.	Lock nut, air jet .....	11913
5.	Rubber sleeve .....	12097
6.	Air jet assembly, includes item 5	
	No. 4 .....	12342
	No. 5 .....	12343
7.	Fitting, hose, 3/8" NPT x 1/2" barb .....	06369
8.	Hose end, 1/2" barb x 1/2" fem. swivel .....	15002
9.	Nozzle, ceramic	
	No. 5, green tip .....	11930
	Nozzle, tungsten carbide	
	No. 5 .....	13118
	Nozzle, boron carbide	
	No. 5 .....	11935
10.	Hose, 1/2" air, specify ft. required .....	12472
11.	Hose, media, clear, specify ft. required .....	12476
12.	Adjusting tool, correctly positions air jet .....	19041

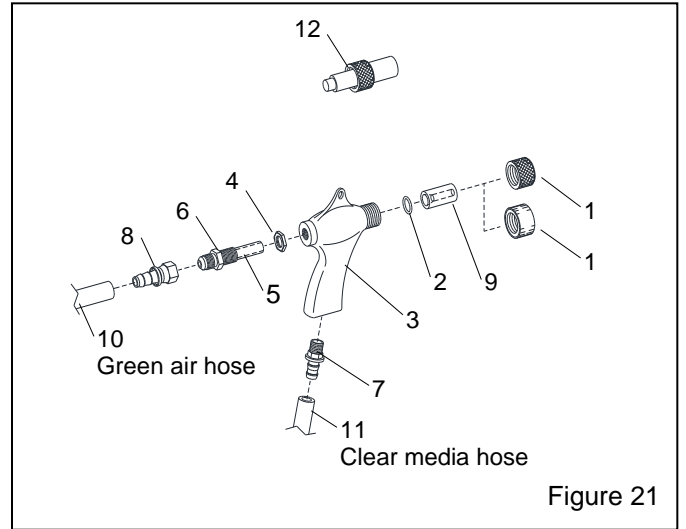


Figure 21

**11.3 View-Window Assembly – Figure 22**

Item	Description	Stock No.
1.	Window glass, 10" x 18" laminated .....	29915
2.	Gasket, 5/16" x 3/4", applied to cabinet per foot, 6-feet required .....	00189
3.	Gasket, 5/32" x 3/4", applied to window frame per foot, 5-feet required .....	00192
4.	Nut, plastic, window frame, 2 required .....	23035
5.	Window frame.....	29908

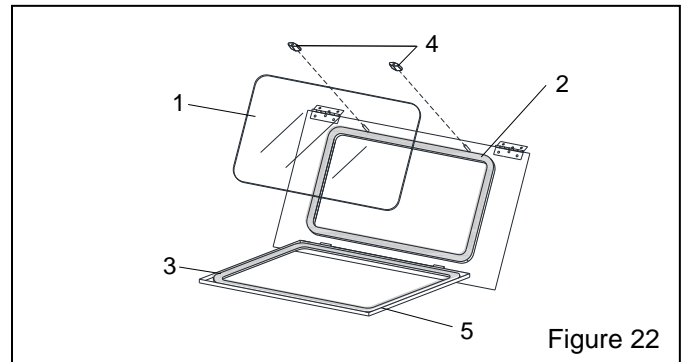


Figure 22

11.4 LED Light Assembly – Figure 23

Item	Description	Stock No.
1.	Cover, LED light mount .....	29800
2.	LED light module, 50w .....	29799
3.	Diffuser lens .....	29802
4.	Gasket .....	29801
5.	Strain relief connector .....	02213
6.	Nut, 1/2"conduit .....	12713
7.	Wing nut, 5/16" .....	03213

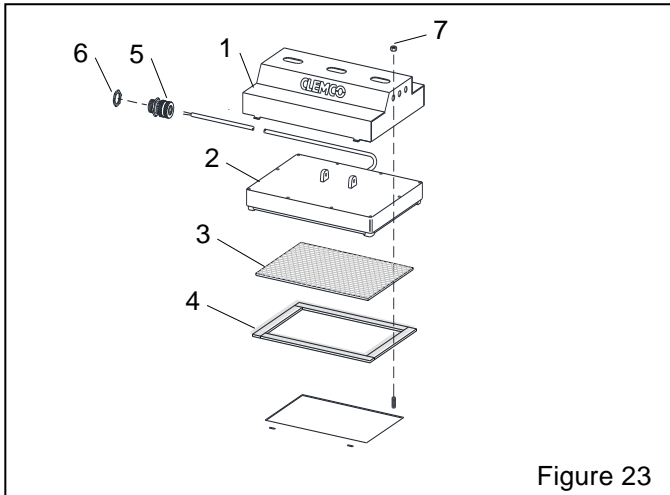


Figure 23

11.5 Foot Pedal – Figure 24

Item	Description	Stock No.
(-)	Foot pedal with tubing .....	20195
1.	Foot pedal casting set, top and base .....	28379
2.	Air valve, 3-way, n/c (blast valve) .....	20026
3.	Drive pin, grooved .....	20109
4.	Screw, socket head, 1/4 nf x 3/4" .....	03086
5.	Spring, 1-1/4" OD x 3-1/2" .....	20121
6.	Adaptor, 10-32 thread x 1/8" barb .....	11731
7.	Screw, fh, 10-32 x 1/2" .....	19571
8.	Urethane 1/8" tubing, specify ft. required ...	12475
9.	Screw, 8-32 x 3/8" .....	11389
10.	Bumper, neoprene .....	21522
11.	Tie, nylon wire (not shown) .....	12139

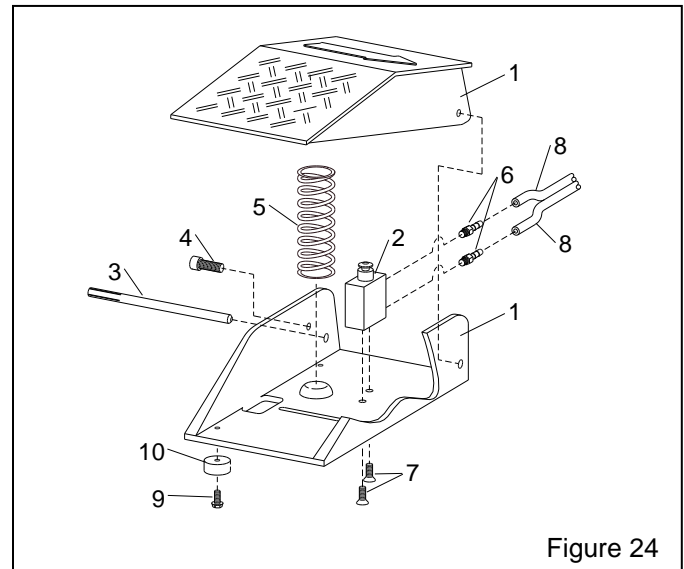
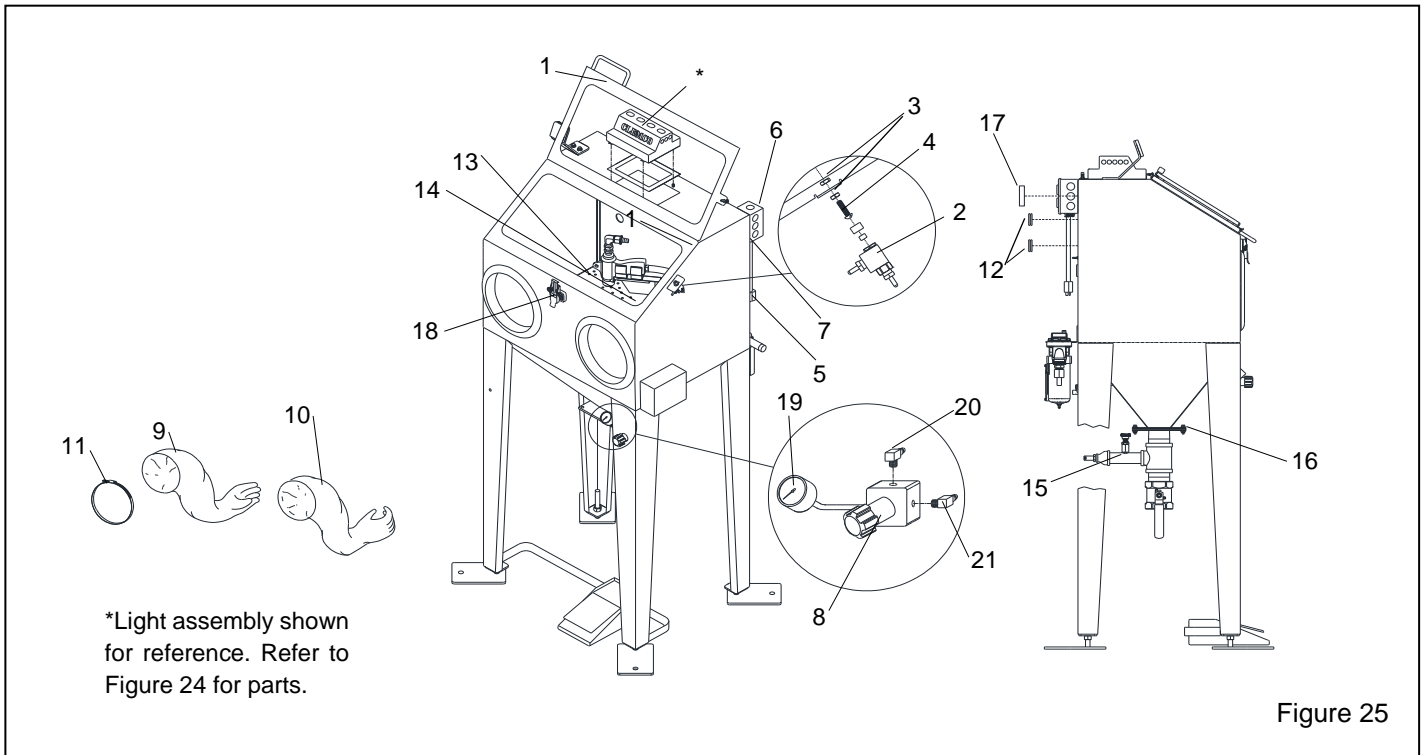


Figure 24

11.6 Cabinet Assembly – Figure 25

Item	Description	Stock No.
1.	Gasket, 1/2" x 1" adhesive-backed, per foot, specify feet required	00189
2.	3-Way valve	12202
3.	Screw nut	12760
4.	Round head screw	03891
5.	Cord, 8 ft. u-ground power	27998
6.	Switch w/u-ground receptacle	10769
7.	Strain relief, 1/2"	02213
8.	Mini-regulator	12715
9.	Glove, left hand only	29905

10.	Glove, right hand only	29906
11.	Clamp, for clamp-attached glove	11576
12.	Grommet, media hose	11798
13.	Grate, left side	29852
14.	Grate, right side	29853
15.	Lexan metering valve assembly	12420
16.	Gasket, dump valve	29804
17.	Grommet, vacuum hose	28668
18.	Latch, front door panel	11876
19.	Pressure gage	01908
20.	Hose fitting, straight	11732
21.	Hose fitting, 90° elbow	11733



11.7 Air and Gun and Feed Assembly – Figure 26

Item	Description	Stock No.
1.	BNP No. 4 gun assembly without nozzle	12301
2.	1/8 Male hose x 1/4 NPT fitting	11732
3.	Hose end, 1/2" barb x 1/2" fem. swivel	15002
4.	Hose, 1/2" air, specify ft. required	12472
5.	90 Degree street elbow, 1/2"	01773
6.	Pipe cross, 1/2"	10254
7.	Bushing, 1/2 x 1/8 HX	11350
8.	Conduit nut, 1/2"	12713
9.	Square HD plug, 1/2"	01759
10.	Pilot operated regulator, 1/2"	11345

11.	Foot pedal assembly	20195
12.	Hose, media, clear, specify ft. required	12476
13.	Lexan metering valve assembly	12420
14.	Urethane 1/8" tubing, specify ft. required	12475
15.	Elbow, 1/8# brass 90 str.	11733
16.	Fitting, 1/8" male hose x 1/4 NPT	11732
17.	3-Way valve	12202
18.	Filter, 1/2-NPT air	01308
19.	1/8 Mini-regulator	12715
20.	Pressure gauge	01908
21.	Elbow, 90 degree 1/8"	13265
22.	Pipe nipple, 1/8 x 2-SCH 40	01895

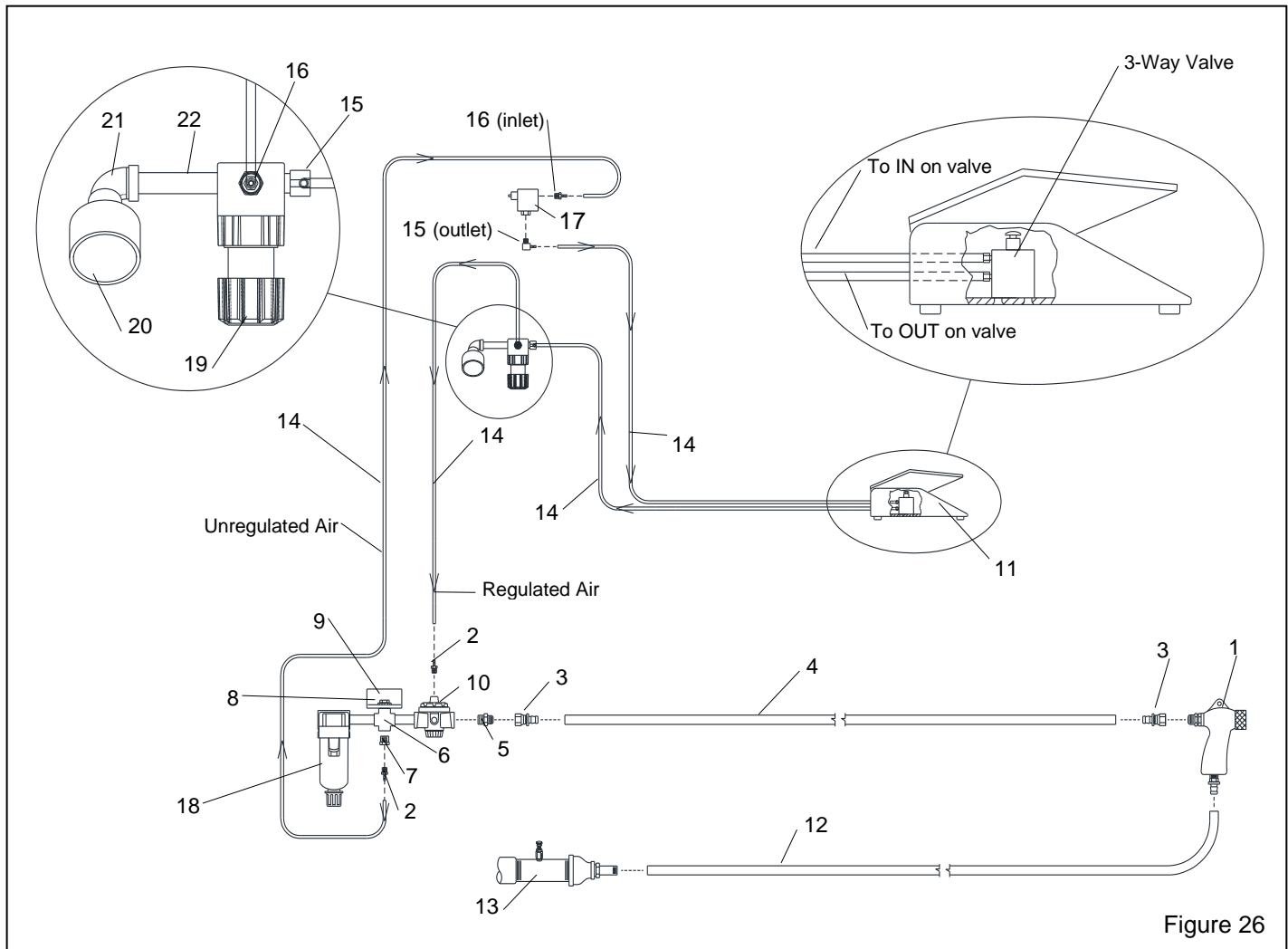


Figure 26

11.8 Dust Collector and Accessories – Figure 27

Item	Description	Stock No.
(-)	Dust collector assembly does not include vacuum hose .....	29794
1.	Filter bag .....	28009
2.	Hose, vacuum 4-ft nominal .....	28674
3.	Grommet, vacuum hose one provided with dust collector .....	28668
4.	Motor .....	12308
5.	Gasket, 5/16" x 1" adhesive-backed, per foot, ten feet required total .....	00187
6.	Cord, 8 ft. u-ground power .....	27998
7.	Strain relief, 3/8" .....	27996
8.	Clamp ring, filter bag .....	28008
9.	Clamp, drum .....	28669
10.	Drum, upper .....	29795
11.	Drum, lower (dust storage) .....	28033
12.	Screw, 1/4-NC x 1" cap .....	03053
13.	Nut 1/4-NC .....	03111
14.	Motor mount plate.....	11994
15.	300 cfm paddle wheel.....	12333
16.	300 cfm blower housing.....	12273
17.	Clamp .....	11578
18.	Outlet screen .....	25092
19.	Blower spacer .....	29796

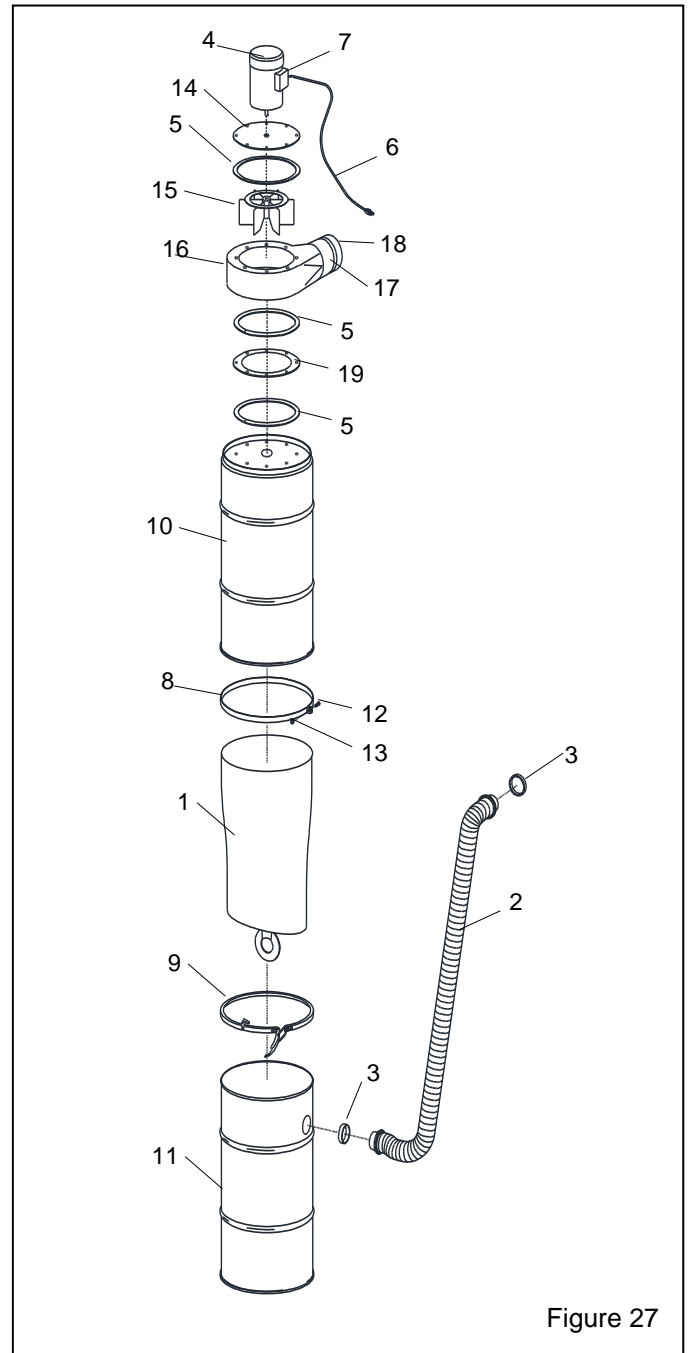


Figure 27