BNP-160 TUMBLE BASKET SUCTION BLAST CABINET

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

Clemco proudly provides products for the abrasive blast 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 insure 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, 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 blast operation for warnings, information, training, and instruction relating to the proper and safe use of their equipment.

One Cable Car Dr.
Washington, MO 63090
Phone (636) 239-4300
Fax (800) 726-7559
Email: info@clemcoindustries.com
www.clemcoindustries.com

ZERO Blast Cabinets®

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 BNP-160 Tumble Basket Blast Cabinet.

1.1.2 These 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.

1.3 Table of Contents

1.4 General Description

1.4.1 The BNP-160 tumble cabinet blasts small batches of parts using a fixed nozzle and rotating basket. Refer to Figure 1 for arrangement and callouts of primary components. The cabinet consists of three major segments:

1. Cabinet enclosure
2. Reclaimer
3. Reverse-pulse dust collector

1.4.2 The maximum capacity of the basket is 25 lbs.

1.4.3 The cabinet requires approximately 33 cfm of compressed air at a maximum of 80 psi.

1.5 Theory of Operation

1.5.1 After parts are loaded into the basket, the air supply and exhauster are turned ON, and the cabinet door is closed, the cabinet is then ready for operation by setting the timer located in the control box atop the cabinet enclosure. Turn the dial to set the blast duration between 1 minute and 60 minutes. Blasting begins once the timer is set. Air moving through the gun draws media into the blast gun mixing chamber. The media mixes with the air and is propelled out the nozzle. As the basket rotates, the parts tumble in the blast stream, ensuring that all parts and surfaces are uniformly blasted. The blast media flows through the perforated drum and into the cabinet hopper. These particles are drawn into the reclaimer for separation. First dust and fines are separated from the reusable blast media. Reusable media is retained in the reclaimer hopper for reuse. Then dust and fines are drawn out of the reclaimer and through the filter cartridge in the reverse-pulse dust collector. The filter cartridge traps dust on the outer surface and discharges clean air through the outlet damper atop the collector. The filter cartridge is cleaned by a pulse of high-velocity compressed air expanding against the inner surface of the cartridge at regular intervals. The expanding air momentarily reverses airflow through the cartridge to release dust accumulated on the outer surface. The dust particles fall away from the cartridge and into the hopper and dust container for removal. Blasting automatically stops when the timed cycle is completed.

1.6 Dust Collector

1.6.1 The BNP-160 cartridge dust collector is not suitable for use in applications that generate dust from lead coatings, heavy metals, or any other toxic materials.

⚠ WARNING

Prolonged exposure to any dust can result in serious lung disease and death. Short-term ingestion of toxic materials, such as lead dust or dust from other heavy metals and corrosives, can cause serious respiratory injury or death. This machine is not to be used in applications which generate dust from lead coatings, heavy metals or any other toxic materials. Identify all materials that are to be removed by blasting and obtain a safety data sheet (SDS) for the blast media.

1.7 Nozzle Options

1.7.1 Ventilation requirements limit standard cabinets to No. 5 (5/16" orifice) nozzle and No. 5 (5/32" orifice) air jet. Unless otherwise specified at the time of order, cabinets are supplied with a tungsten carbide lined nozzle. Ceramic nozzle are available but should be limited to occasional blasting and with mild media. More durable boron carbide nozzles should be used when blasting with aggressive media such as those listed in Section 1.9.4. Nozzle options are shown under Gun, Media Feed, and Plumbing Assembly in Section 8.4.

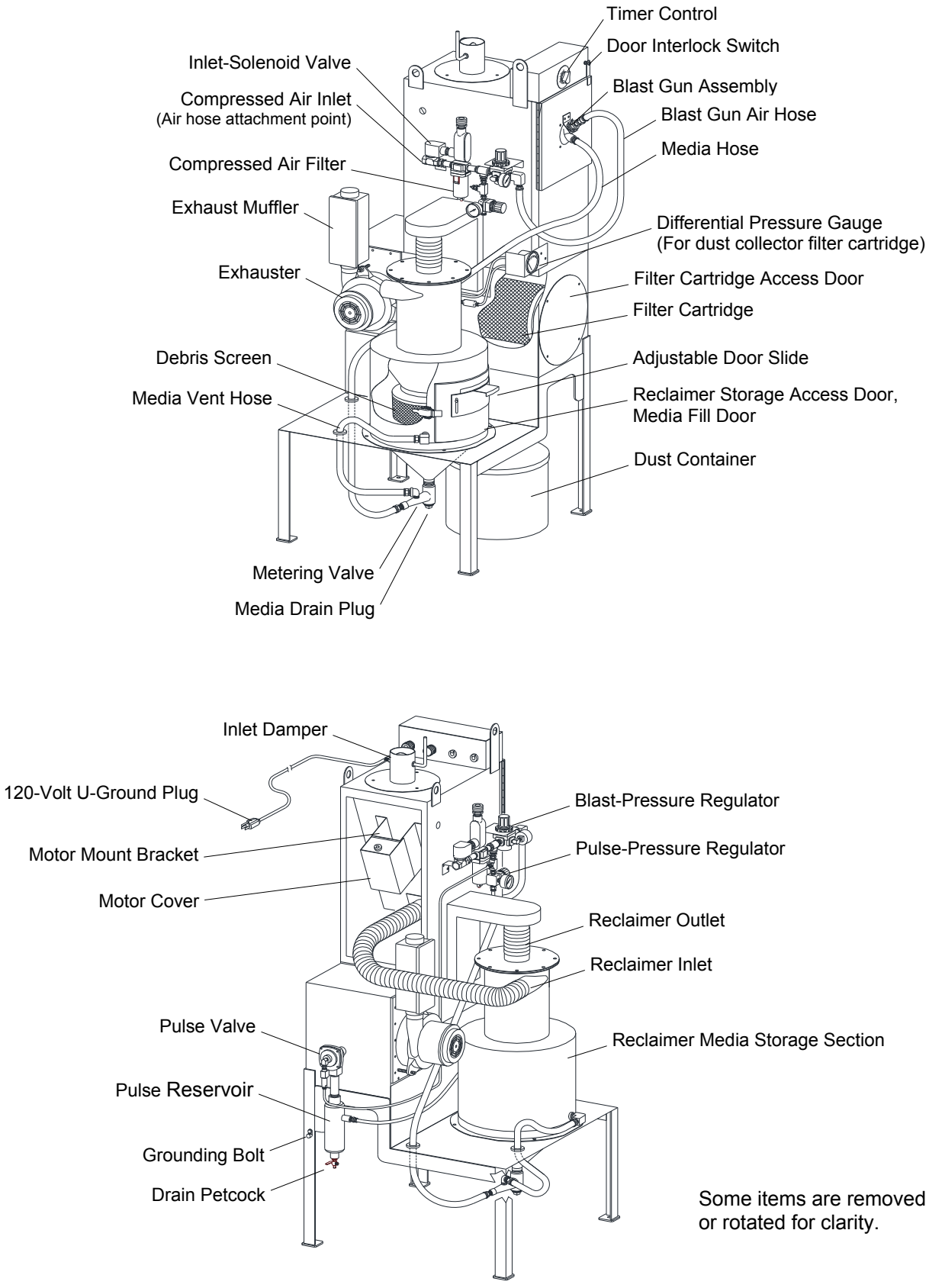

Timer Control
Door Interlock Switch
Inlet-Solenoid Valve
Blast Gun Assembly
Compressed Air Inlet
(Air hose attachment point)
Blast Gun Air Hose
Media Hose
Compressed Air Filter
Exhaust Muffler
Differential Pressure Gauge
(For dust collector filter cartridge)
Exhauster
Filter Cartridge Access Door
Filter Cartridge
Debris Screen
Adjustable Door Slide
Media Vent Hose
Reclaimer Storage Access Door,
Media Fill Door
Dust Container
Metering Valve
Media Drain Plug
Inlet Damper
120-Volt U-Ground Plug
Blast-Pressure Regulator
Motor Mount Bracket
Pulse-Pressure Regulator
Motor Cover
Reclaimer Outlet
Reclaimer Inlet
Pulse Valve
Reclaimer Media Storage Section
Pulse Reservoir
Grounding Bolt
Drain Petcock
Some items are removed
or rotated for clarity.

Figure 1

1.8 Tumble Basket Options

1.8.1 Standard baskets are perforated with 3/16" holes. An optional basket with 1/16" holes is offered for use with fine abrasive or applications that produce small chips or other byproducts that could plug the blast nozzle. Refer to basket and drive assembly replacement parts om Section 8.3.

1.9 Media

1.9.1 The BNP-160 utilizes most common reusable media 60 mesh to 180 mesh that is specifically manufactured for dry blasting. Media finer than those recommended may carry over to the dust collector. Media coarser than those recommended may not convey through the media hose or recovery hose.

1.9.2 Steel: Steel grit 50 mesh to 120 grit or S70 to S170 shot may be used.

1.9.3 Sand and slag media These are not suitable for cabinet use. Sand should NEVER be used for abrasive blasting because of the respiratory hazards associated with media containing free silica. Slags are not recommended because they rapidly break down and are not recyclable.

1.9.4 Aluminum Oxide, Silicon Carbide, and Garnet: These are the most aggressive of the commonly used media. Aggressive media such as these between 60 mesh and 180 mesh may be used, but the service life of any components exposed to the media will be reduced. To avoid unscheduled downtime and maximize cabinet life, periodically inspect all parts of the cabinet, basket, nozzle, and hoses, that come in contact with the media. Boron carbide lined nozzles are recommended when using aggressive media.

1.9.5 Glass Bead Recommended range is #6 thru #13: 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.

1.9.6 Fine-Mesh Media: In most cases media finer than 180 will carry over to the dust collector.

1.9.7 Lightweight 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.

1.10 Compressed Air Requirements

1.10.1 The cabinet requires approximately 33 cfm of compressed air at a maximum of 80 psi.

1.10.2 The 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 fine-mesh media are used. Moisture causes media to clot 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.

1.11 Electrical Requirements

1.11.1 The system requires 115 VAC, 1 PH, 60 Hz, with 15 amps service. A 7-foot power cord is supplied. No additional wiring is required.

⚠ WARNING

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

2.0 INSTALLATION

2.1 General Installation Notes

2.1.1 Place the cabinet in a convenient location where compressed air and electrical service are available. Allow full access to the doors and service areas.

2.2 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:

- **Lockout and tagout the compressed air supply.**
- **Bleed the compressed air-supply line.**

2.2.1 Refer to Figure 2 and 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

inlet solenoid located on the side of the cabinet. The style of connection shown in Figure 2 is for reference only. The air line may also be hard piped.

2.2.2 Connect a 1/2" ID or larger air line from the air source to the air fitting, as shown in Figure 2.

⚠ WARNING

To avoid the risk of injury from compressed air, install an isolation valve and bleed-off valve where the air supply is tapped into the compressed air source. This enables depressurization of the compressed-air line before performing maintenance.

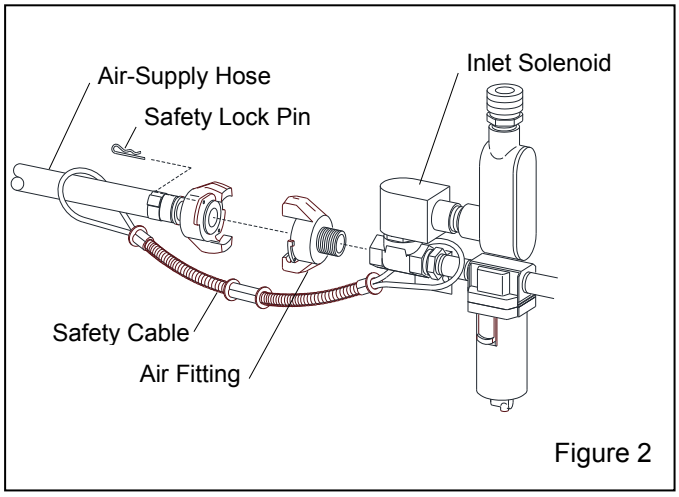


Figure 2

⚠ WARNING

Hose disconnection while under pressure could 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 8.1: Optional Accessories.*

2.3 Ground Cabinet

2.3.1 To prevent static electricity buildup, attach an external grounded wire from an earth ground to the grounding bolt on the rear of the cabinet.

2.4 Plug the cabinet power cord into a grounded, 115-volt outlet.

⚠ WARNING

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

3.0 OPERATION

3.1 Control Functions

3.1.1 Timer: Sets duration of the blast cycle up to 60 minutes. Blasting begins as soon as the timer is set. Blasting automatically stops when the timed cycle is complete.

3.1.2 Door Interlock: When the door is open, the blast gun is disengaged, preventing blasting.

3.2 Media Loading and Unloading

3.2.1 Media Loading: With the timer off, add clean dry media by pouring it through the reclaimer access door. Do not fill above the storage section's cone.

3.2.2 Media Unloading: To empty the cabinet and reclaimer of spent media, allow all media to be recovered from the cabinet, turn off the exhauster, and place an empty container under the media-metering valve located under the reclaimer storage section. Unscrew the plastic plug, permitting media to flow into the container. If media does not flow, it has caked. Open the fill door and stir media until it starts to flow. Replace the drain plug when the storage section is empty.

3.2.3 When changing media type, use a vacuum and thoroughly purge the cabinet of media, especially when changing from coarse media to fine or when changing from hard media to soft.

3.3 Loading and Unloading Parts

3.3.1 Parts must be free of oil, water, grease, or other contaminants that will cause media to clump or contaminate parts.

3.3.2 Unlatch and open the front door and load parts directly into the tumble basket. Do not overload the basket; maximum load should not exceed 25 lb or the bottom edge of the retainer, as shown in Figure 3.

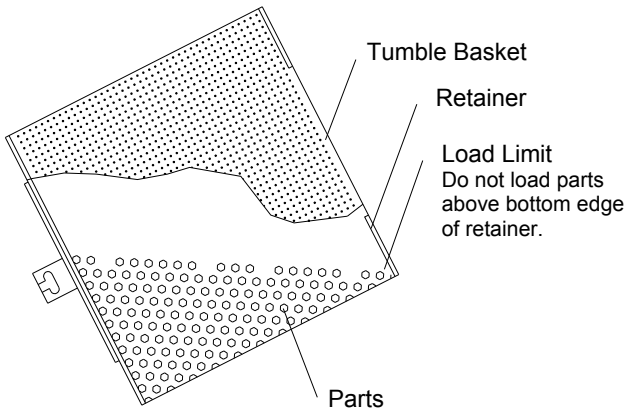


Figure 3

3.3.3 Do not underload with parts; underloading will result in rapid wear to the tumble basket. When blasting small loads, to prevent the blast stream from blasting the basket, add filler material (dunnage), as shown in Figure 4, such as an abrasive-resistant tumble media that is compatible with the parts being blasted.

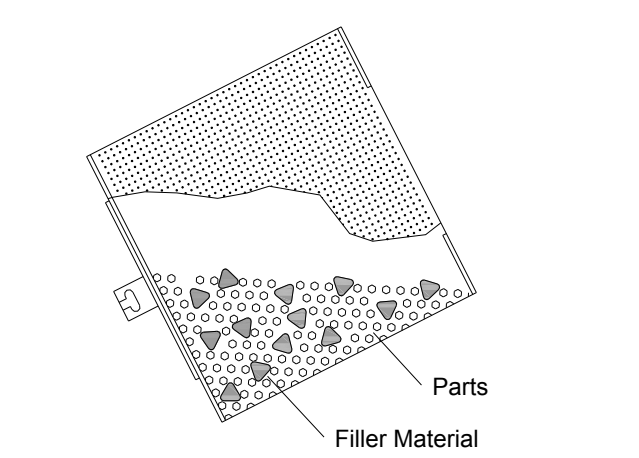


Figure 4

3.3.4 Close door and latch securely.

3.4 Blasting Operation

⚠ WARNING

To avoid hazardous dust leakage and equipment malfunction:

- **Keep door closed during blasting.**
- **Stop blasting immediately if dust leaks are detected.**

3.4.1 Slowly open the air valve on the air-supply hose to the cabinet. Check for air leaks on the initial start up, and periodically thereafter.

3.4.2 Adjust the blast-pressure regulator located on the side of the cabinet to the required blast pressure per Section 4.1.

3.4.3 Adjust the pulse-pressure regulator located on the side of the cabinet to the required pulse pressure per Section 4.2.

NOTICE

Do not pulse new dust collectors or replacement cartridges until the cartridge is properly seasoned. Refer to Section 6.4. Pulsing unseasoned cartridges can cause premature cartridge failure or decrease the efficiency of the dust collector.

3.4.4 Load media and parts. Note load limit in Figure 3.

3.4.5 Close the cabinet door. Make sure the door is latched securely, or door interlock system will prevent blasting.

3.4.6 Start the blast cycle by turning the timer for the for the blast duration, between 1 and 60 minutes. Blasting begins as soon as the timer is set.

⚠ WARNING

Shut down the cabinet immediately if dust discharges from the cabinet or dust collector. Prolonged breathing of any dust can result in serious lung disease. Short-term ingestion of toxic dust such as lead poses an immediate danger to health. Toxicity and health risk vary with type of media and dust generated by blasting. Identify all material being removed by blasting and obtain a safety data sheet (SDS) for the blast media.

3.5 Stop Blasting

3.5.1 Blasting, basket rotation, and the exhauster stop when the timer cycle is completed.

3.5.2 Open the door only enough to disengage the door interlock, and turn the timer ON to start the exhauster. Let it run for several seconds to clear airborne dust, then turn the switch OFF.

3.5.3 Remove parts and check blast coverage.

3.5.4 Reload additional parts, or when finished blasting, shut off the air-supply valve and drain the air filter and dust collector pulse reservoir.

4.0 ADJUSTMENTS

4.1 Blasting Pressure – Figure 5

4.1.1 The blast-pressure regulator located in the piping on the side of the cabinet is used to adjust blasting pressure to suit the application. The maximum recommended pressure is 80 psi. Lower pressure may be used for delicate work. Higher pressure may cause dust or media to escape from the cabinet.

4.1.2 To adjust, unlock the knob by pulling it out and turn it clockwise to increase pressure or counter-clockwise to decrease pressure. Pressure will usually drop from closed-line pressure when blasting begins. Once operating pressure is set, push the knob in to lock it and maintain the setting.

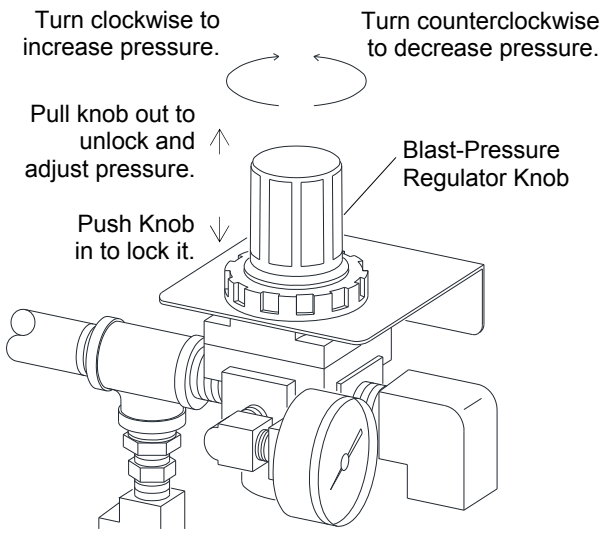


Figure 5

4.2 Pulse Pressure – Figure 6

NOTICE

Do not pulse new dust collectors or replacement cartridges until the cartridge is properly seasoned. Refer to Section 6.4. Pulsing unseasoned cartridges can cause premature cartridge failure or decrease the efficiency of dust collector.

4.2.1 The pulse-pressure regulator, located in the piping below the blast-pressure regulator, is used to adjust pressure of the dust collector pulse. After the cartridge is seasoned, set the pulse pressure to 40 psi. When differential pressure reaches 8 inches (as noted on the differential pressure gauge), do additional pulsing as noted in Section 5.4 and increase pulse pressure by 10 psi. Continue to do additional pulsing and increase pressure by 10 psi when differential pressure reaches 8 inches until the maximum of 80 psi is reached. Replace the cartridge when 80 psi does not lower pressure below 8 inches or sooner if media recovery is impaired.

4.2.2 To adjust, unlock the knob by pulling it out, as shown in Figure 6 and turn it clockwise to increase pressure or counterclockwise to decrease pressure. Once pressure is set, push the knob in to lock it and maintain the setting.

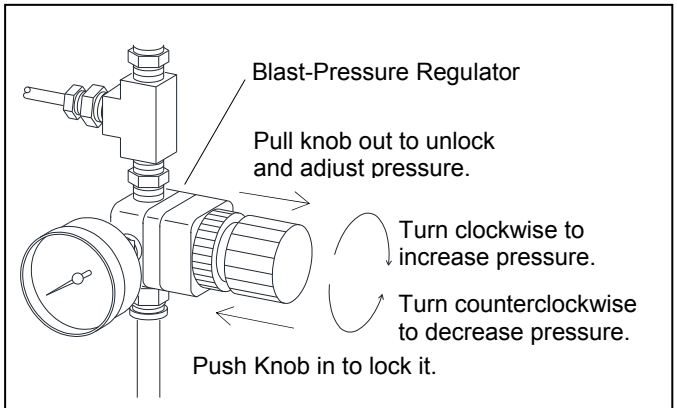


Figure 6

4.3 Timer, Blast Duration

4.3.1 Turn the timer dial to set the timer for the duration of the blast cycle. Blasting begins when the timer is set and automatically stops when the timed cycle ends. Trial and error will determine the timer setting for the most favorable results. After the part is correctly processed, make a note of the total blast time for future runs of similar parts.

4.4 Door Interlock, Refer to Figure 7

⚠ WARNING

Never attempt to override the interlock system. Doing so can result in injury from unexpected blasting.

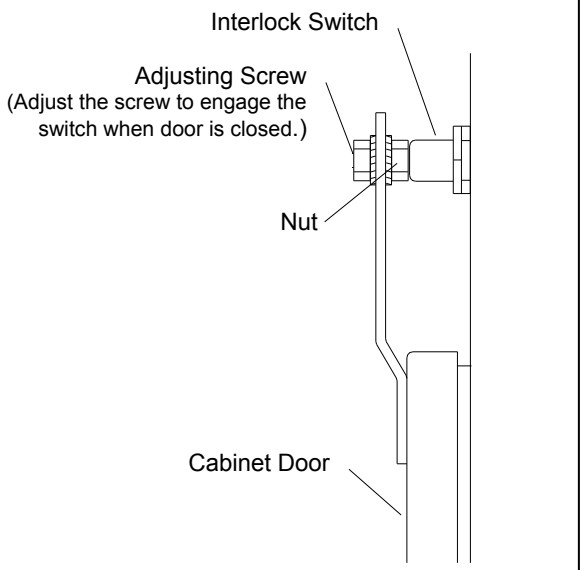


Figure 7

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

4.4.1.1 Close cabinet door.

4.4.1.2 Loosen the adjusting screw nut.

4.4.1.3 Center the adjusting screw on the switch and turn it in or out as required to engage the switch without applying excessive pressure. Tighten the adjusting screw nut to secure.

4.4.1.4 Test the operation with the door open only enough to disengage the interlock switch, and then again with the door closed. The interlock should stop the blasting when the door is opened and permit blasting when the door is closed.

4.5 Inlet Damper – Figure 8

4.5.1 Operate with the damper fully open. A closed or partially closed damper will reduce air movement through the cabinet and can cause dust leaks from cabinet or media buildup in cabinet.

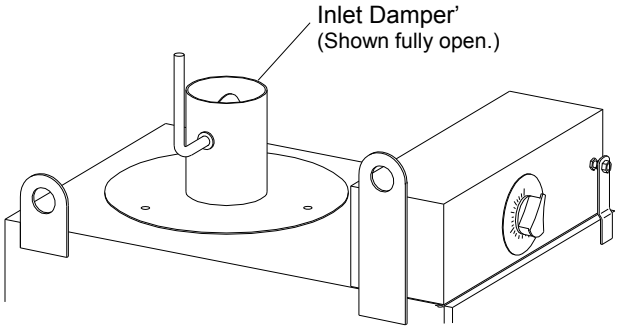


Figure 8

4.6 Adjustable Door Slide, Reclaimer Storage Section – Figure 9

4.6.1 The door slide is adjustable from fully closed to various degrees of open. The adjustment controls the amount of fines that are retained or removed from recycled media. When the slide is closed, no ambient air enters the reclaimer and finer media is retained. As the slide is gradually opened ambient air is drawn in, drawing out fines into the dust collector. The further the slide is opened, the more air is drawn in, which pulls out larger particles of spent media.

4.6.2 Begin with the slide closed.

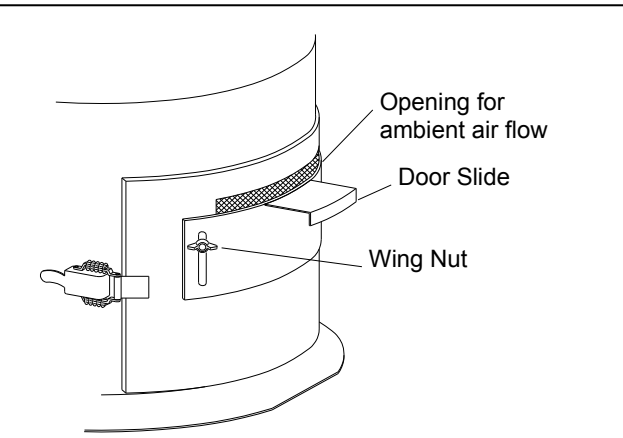


Figure 9

4.6.3 To Remove More Fines: (Too much dust in media.) Loosen the wing nuts and lower the door by no more than 1/16" increments. It may take a few cycles to remove the fines; allow the media to go through several cycles before further adjustment. Lower the door to remove more fines; raise the door to retain more media.

The following are examples of the door slide setting during factory tests:

1) #13 glass beads – slotted door shut
2) #8 glass beads – slotted door open about 3/16"
3) #11 glass beads – slotted door open about 3/32"
4) 180 mesh aluminum oxide – slotted door open about 3/32"
5) 80 mesh aluminum oxide – slotted door open about 1/8"

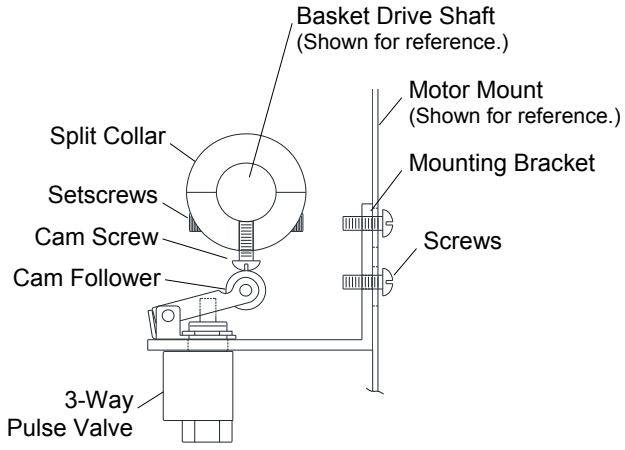
4.6.4 To Remove Less Fines: (Too much good media carried over to the dust collector.) Loosen the wing nuts and raise the door by no more than 1/16" increments.

4.7 Dust Collector Pulse, Pulse Valve/Cam Follower – Figure 10

4.7.1 The pulse activating mechanism is located within the motor mount bracket.

4.7.2 The dust collector pulses once with each revolution of the basket. When the screw on the split collar rotates over the cam follower, it pushes in the plunger on the 3-way pulse valve and triggers the pulse.

4.7.3 Loosen the collar setscrews and rotate the split collar so the cam screw is riding on the cam follower. Tighten the setscrews to secure the collar.



Some items are removed for clarity.

Figure 10

4.7.4 Loosen the mounting bracket screws and adjust the height so the cam follower depresses the plunger on the 3-way pulse valve. Snug the screws to hold the bracket in place.

4.7.5 Set the blast-pressure regulator to zero psi and set the pulse-pressure regulator to 40 psi.

4.7.6 Turn the timer dial to start the basket rotation.

4.7.7 The collector should pulse each time the cam screw rides onto the cam follower and stop when the screw rides off the follower.

4.7.8 Adjust the mounting bracket up or down until the pulse functions accordingly. Tighten the mounting screws to secure.

5.0 PREVENTIVE MAINTENANCE

⚠ WARNING

This machine is not to be used for applications that generate dust from lead coatings, heavy metals, or <u>any</u> other toxic materials. Failure to wear approved respirators and eye protection when servicing dust-laden areas of the cabinet and dust collector, and when emptying the container, can result in serious eye irritation and lung disease. Toxicity and health risk vary with type of media and dust generated by blasting. The respirator must be approved for the type of dust generated. Identify all material being removed by blasting and obtain a safety data sheet (SDS) for the blast media.

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

5.1 Daily Maintenance

5.1.1 Check media level and condition of media: Refill or change media as necessary.

5.1.2 Check reclaimer screen for debris: The screen is accessible through the reclaimer door. With the exhauster OFF, remove the screen and empty it daily and when loading media. Empty the screen more often if part blasted causes excessive debris. Do not operate the machine without the screen in place, oversized byproduct from blasting could plug the nozzle.

5.1.3 Drain compressed air filter – Figure 11: The cabinet is equipped with a manual-drain air filter. Open the drain at least daily; if water is present, open periodically during operation. Moist air inhibits the flow of media; 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.

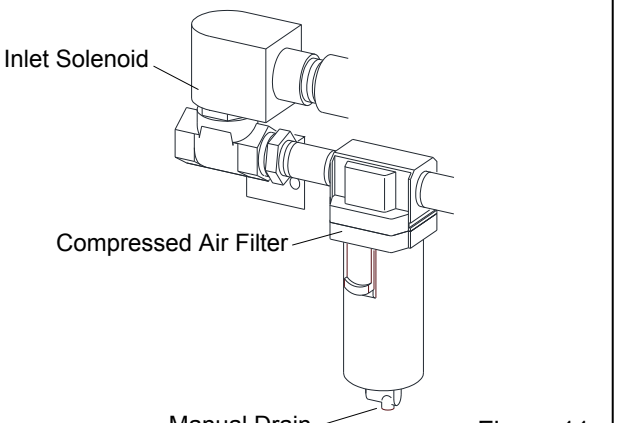


Figure 11

5.1.4 Drain pulse reservoir – Figure 12. Open the petcock to drain water from the pulse reservoir after each use. If water is present, open periodically during operation.

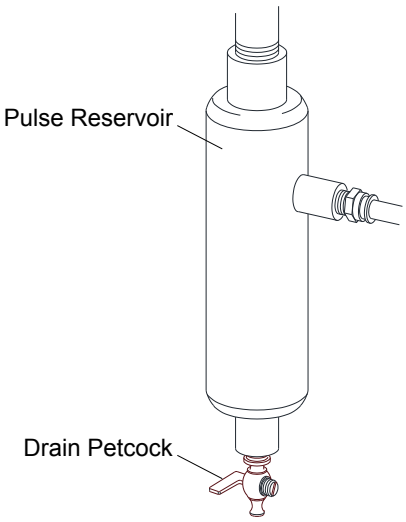


Figure 12

5.1.5 Inspect Dust Level and Empty Dust Container

NOTICE

Inspect dust level in the dust container each time the collector is shut off and when adding new media to the cabinet. Empty the dust container when it is no more than half-full. Failure to monitor the dust level will overfill the collector, requiring extensive cleaning.

NOTE: Blast media is usually nontoxic, however, materials removed by the blast process may be toxic. Check with local authorities for disposal restrictions.

5.1.5.1 Empty dust level and empty the dust container regularly. Start by checking the container at least daily and when adding media, then adjust frequency based on usage, contamination, and friability of the media.

5.1.5.2 Turn off the exhauster and release the lid lock ring from the dust container, as shown in Figure 13.

5.1.5.3 Pry off the lid from the container (the lid's flexible inlet hose allows easy removal) and remove the container.

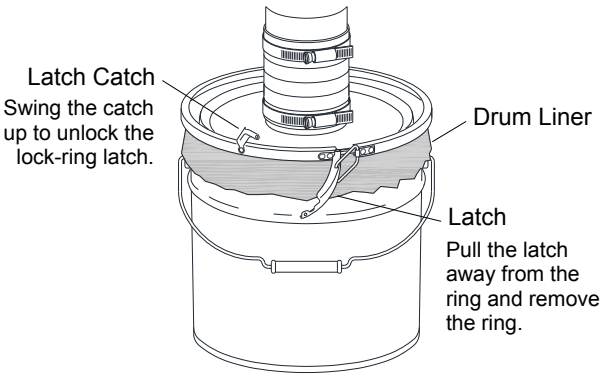


Figure 13

5.1.5.4 Tie off or otherwise seal the top of the liner and remove it from the container. Dispose of the sealed liner into a suitable disposal receptacle.

5.1.5.5 Place a new liner inside the container and drape it over the top edge. Reattach the container to the lid and latch the lock ring, making sure the lid and clamp are secure. Replacement liners are shown in Section 8.6, Figure 23, Item 28.

5.2 Weekly Maintenance

5.2.1 Inspect nozzles and gun bodies for wear as noted in Section 6.1, Replace nozzle when orifice diameter is worn 1/16" larger than original size or when suction diminishes noticeably.

5.2.2 During operation, inspect cabinet door seals for media leaks.

5.2.3 Inspect flex hoses for wear.

5.2.4 Inspect the media hose for thin spots by pinching it every 6 to 12 inches. Replace the hose when it becomes soft.

5.3 Monthly Maintenance

5.3.1 Inspect reclaimer wear plate for wear. Replace as necessary.

5.3.2 Inspect reclaimer door gasket for wear or damage.

5.3.3 Inspect the tumble basket's bottom liner for wear. Replace the liner per Section 6.2 as soon as the liner is worn thin and before wearing through to the bottom plate.

5.4 Additional Cartridge Pulsing

5.4.1 The cartridge is pulsed with each revolution of the basket. Additional pulsing should be performed as noted below before adjusting the pulse pressure:

5.4.1.1 Turn blast pressure to 0 psi.

5.4.1.2 Turn exhauster ON.

5.4.1.3 Set timer to five minutes.

5.4.1.4 After the five minute cycle is complete, check the differential pressure gauge. If differential pressure stays at around 8 inches, increase pulse pressure by 10 psi increments as noted on Section 4.2.

5.4.1.5 Repeat the process once or twice.

6.0 SERVICE MAINTENANCE

⚠ WARNING

This machine is not to be used for applications that generate dust from lead coatings, heavy metals, or <u>any</u> other toxic materials. Failure to wear approved respirators and eye protection when servicing dust-laden areas of the cabinet and when emptying the dust container can result in serious eye irritation and lung disease. Toxicity and health risk vary with type of media and dust generated by blasting. The respirator must be approved for the type of dust generated. Identify all material being removed by blasting and obtain a safety data sheet (SDS) for the blast media.

6.1 Gun and Nozzle Assembly

6.1.1 Open the cabinet door, unscrew the holding nut from the gun end, and pull the nozzle from the gun.

6.1.2 Inspect the gun body, nozzle, orifice, and 1/4" NPT nipple for wear. Replace any that are worn or damaged. Replace the nozzle when its orifice diameter has increased to 3/8" (increased by 1/16" larger than when new), or when suction diminishes noticeably.

6.1.3 When installing the nozzle, insert the tapered end into the gun placing the tapered end toward the jet. Screw the holding nut onto the gun.

6.2 Tumble Basket

6.2.1 Periodically inspect the basket and bottom liner for wear.

6.2.2 The bottom liner is held to the bottom of the basket by the two support ribs; remove the liner by peeling it from the bottom and from under the ribs.

6.2.3 Replace the liner in reverse order, tucking the edge under the support ribs.

6.2.4 Replace the basket as soon as it is worn thin.

6.3 Filter Cartridge Replacement Figures 14 and 15

⚠ WARNING

Failure to wear approved respirators and eye protection when servicing dust-laden areas of the cabinet and dust collector, and when changing the filter cartridge, can result in serious eye irritation and lung disease or death.

6.3.1 Close the air-supply valve and bleed all air from the pulse reservoir.

6.3.2 Remove the four wing nuts and washers securing the cover plate and remove the cover plate.

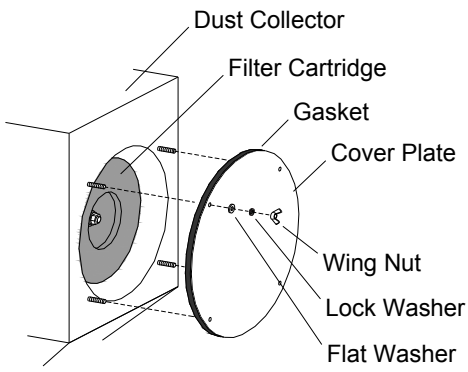


Figure 14

6.3.3 Remove the nut, lock washer, flat washer, and rubber gasket from the cartridge support, as shown in Figure 15. Remove the cartridge through the opening, sliding it off the support. **NOTE: Contain dust by sliding a durable plastic bag over the cartridge as it is removed.**

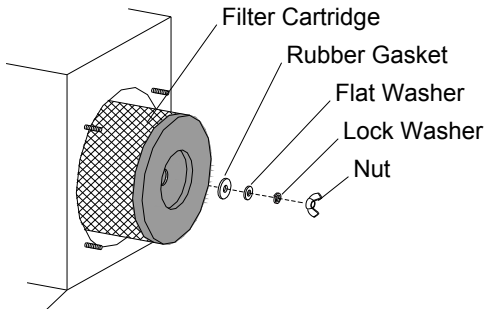


Figure 15

6.3.4 After the cartridge is removed, clean the inside of the collector to remove loose dust or hardened dust clumps, particularly from the cartridge sealing surface (front side of the cartridge sheet).

6.3.5 A new rubber gasket comes with the new cartridge. Use the new gasket, reuse the fasters, and install the cartridge in reverse order.

6.3.6 Inspect the cover gasket for any condition that will prevent the gasket from sealing. Replace the gasket if necessary.

6.3.7 Install the cover plate and secure.

6.3.8 Season cartridge per Section 6.4.

6.4 Seasoning Cartridge

6.4.1 New cartridge must be seasoned. Cartridges are seasoned by not pulsing them until a dust cake develops on the filter media.

6.4.2 To prevent cartridge pulsing, turn the pulse regulator off (to 0 psi).

6.4.3 Operate the cabinet without pulsing until the differential pressure gauge reaches 2 inches. At that time, turn the pulse regulator to 40 psi to start the pulsing cycle. Refer to Section 4.2 to adjust pulse pressure.

6.5 Inline Filter, Differential Pressure Gauge Figure 16

6.5.1 Periodically inspect the inline filter for dust. Dust collects on the outer surface of the element.

6.5.2 To remove the dust and clean the element, turn the inlet end cap toward O, as stamped on the cap, and then pull the cap from the clear housing. **NOTE: Only the inlet cap opens.** Refer to Section 6.6 if the tubing needs to be removed.

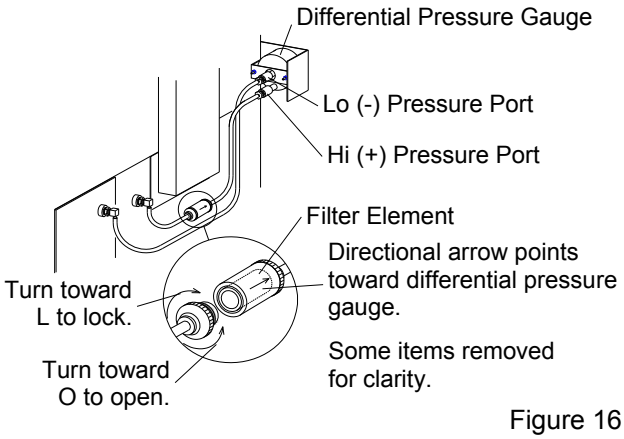


Figure 16

6.5.3 Remove the element and empty dust from the housing.

6.5.4 Shake the cap and tubing to see if dust is in the tubing. If dust is present, remove the tubing from the cap and shake the tubing until all dust is removed.

NOTICE

If the inline filter is removed from the tubing, reinstall it with the directional arrow pointing toward the Hi (+) pressure port on the differential pressure gauge, as shown in Figure 16.

6.5.5 Before attaching the inlet cap, be sure the filter is correctly positioned. Align the tabs on the cap with the recesses on the housing. Make sure the end of the cap enters the ID of the element as it is pushed into position. Turn the cap toward L to lock it in place.

6.6 Tube-Lock Fittings – Figure 17

⚠ WARNING

Failure to observe the following procedure before performing any maintenance can cause injury from the sudden release of trapped compressed air.

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

6.6.1 To remove the tubing, push the retaining collar toward the fitting, releasing the tubing so it can be easily removed by pulling it out. Do not force it; only a slight pull on the tubing is required if the collar is pushed in correctly.

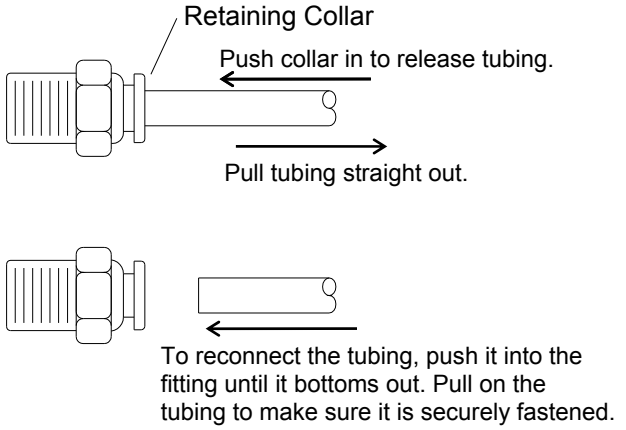


Figure 17

6.6.2 Reconnect the tubing by inserting it into the retaining collar until it seats. Tug on the tubing to make sure it is secured.

6.7 Replace Reclaimer Wear Plate – Figure 18

6.7.1 Remove the fasteners holding the reclaimer top to the body and remove the top.

6.7.2 The gasket should adhere to the reclaimer when the top is removed. Inspect the gasket and replace it if damaged.

6.7.3 Remove the screws that hold the wear plate to the body and remove the old wear plate.

6.7.4 Press or clamp the new wear plate into position and use self-drilling screws inserting through the existing screw holes to secure the wear plate.

6.7.5 Replace the top and secure with fasteners.

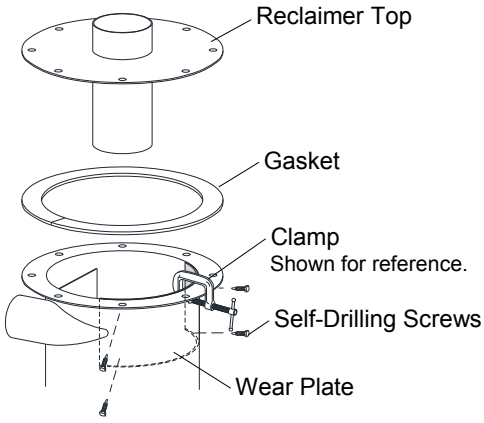


Figure 18

7.0 TROUBLESHOOTING

⚠ WARNING

To avoid serious injury from the sudden release of trapped compressed air, observe the following when troubleshooting:

- **Turn off the air, and lockout and tagout the air supply.**
- **Bleed all compressed air supply lines.**

7.1 Dust Leaking from the Cabinet Enclosure

7.1.1 Dirty filter cartridge reducing air flow through cabinet. Check differential pressure gauge. Refer to Sections 4.2 to adjust pulse pressure and Section 5.4 for additional pulsing.

7.1.2 Damaged door gaskets. Inspect and replace damaged gaskets.

7.1.3 Blast pressure too high. Maximum blast pressure is 80 psi.

7.1.4 Blockage in flex hose between cabinet sump and reclaimer inlet. Inspect hose for blockage.

7.1.5 Exhauster not operating. Make sure exhauster motor is in operation. If it is not, have the motor and circuit checked by a qualified electrician.

7.1.6 Inlet damper closed or partially closed. Damper should be fully open.

7.2 Abnormally High Media Consumption

7.2.1 Door on reclaimer open or improper fit, or worn door gasket. Air entering the reclaimer at this point will cause media to be carried into the dust collector. DO NOT operate unless all doors are closed.

7.2.2 Reclaimer slide door open. Refer to Section 4.6 to adjust slide door.

7.2.3 Media may be too fine or worn-out. Refer to Section 1.9 for recommended media size.

7.2.4 Using friable media that rapidly breaks down.

7.2.5 Nozzle pressure too high for the media, causing media to break down.

7.3 Reduction in Blast Cleaning Rate

7.3.1 Low media level reducing media flow. Check media level; add or replace media as needed.

7.3.2 Reduced air pressure, which could be caused by a malfunctioning pressure regulator, a dirty filter element in the air filter, a partially closed air valve, a leaking air line, or other air tools in use.

7.3.3 Blockage in media hose or gun. Refer to Section 7.4 and 7.7.

7.3.4 Kink or blockage in vent hose between metering valve and reclaimer. Make sure hose is clear.

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

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

7.3.7 Moist media. Frequent bridges or blockage in the area of the metering valve can be caused by moisture. Refer to Section 7.6.

7.4 Plugged Nozzle

7.4.1 Remove nozzle and check for blockage from foreign material. If the standard tumble basket allows large particles to pass and block the nozzle, use the optional basket with 1/16" diameter holes. Refer to Section 8.1. If nozzle is blocked by hardened or caked media, moisture is present. Refer to Section 7.6

7.5 Media Bridging

7.5.1 Frequent bridging or blockage in the media-metering valve can be caused by damp media. Media becomes damp by blasting parts that are slightly oily because of moisture in the compressed-air line or from absorption from ambient air.

7.5.2 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.

7.5.3 Moist compressed air may be due to a faulty compressor that overheats, or pumps oil or moisture into the air line; too long of an air line permitting moisture to condense on the inside; and from high humidity. Drain

the air filter and receiver tank regularly. If the problem persists, it may be necessary to change media more often, or install an aftercooler or air dryer.

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

7.5.5 Using lightweight or low-density media as noted in Section 1.9.7.

7.6 Neither Media Nor Air Comes Out the Nozzle During the Blast Cycle.

7.6.1 Door interlocks not engaging. Check adjustment per Section 4.4.

7.6.2 Pressure regulator may be turned down or off. Check pressure on regulator gauge.

7.6.3 Make sure that the air compressor is on and air-supply valves are open.

7.6.4 Plugged nozzle. Refer to Section 7.4

7.6.5 Timer or inlet-solenoid valve malfunction. Inspect by qualified electrician.

7.7 Blockage in Media Hose

7.7.1 Wet or damp media. Refer to Section 7.6.

7.7.2 Kink or blockage in vent hose between metering valve and reclaimer. Make sure hose is clear.

7.8 Poor Suction in Media Hose

7.8.1 Nozzle is worn. Replace if worn 1/16" or more.

7.8.2 Blockage in media hose or nozzle. Refer to Sections 7.4 and 7.5.

7.8.3 Air pressure too high. Reduce pressure to 80 psi maximum.

7.9 Air Only (no media) from Nozzle

7.9.1 Nozzle pressure too high for the media, causing media to break down.

7.9.2 Reduced air pressure decreases vacuum in media hose, which could be caused by a malfunctioning pressure regulator, a dirty filter element in the air filter, a partially closed air valve, a leaking air line, other air tools in use, or regulator pressure set too low.

7.9.3 Blockage in media hose or gun. Refer to Section 7.4 and 7.7.

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

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

7.9.6 Moist media. Frequent bridges or blockage in the area of the metering valve can be caused by moisture. Refer to Section 7.5.

7.10 Blowback Through Media Hose

7.10.1 Blockage in nozzle. Remove the nozzle and check for blockage.

7.10.2 Air jet washer (Figure 21, Item 5) not tightly sealed against air jet. Tighten the bushing into the gun body.

7.10.3 Air pressure too high. Reduce pressure to 80 psi maximum.

7.11 Media Buildup in Cabinet Hopper; Media Does Not Convey to Reclaimer

7.11.1 Inlet damper closed or partially closed restricting air movement through cabinet. Open damper per Section 4.5.

7.11.2 Dirty filter cartridge reducing air flow through cabinet. Inspect differential pressure gauge. Refer to Sections 4.2 and 5.4.

7.11.3 Damaged door gaskets. Inspect and replace damaged gaskets.

7.11.4 Blockage in flex hose between cabinet hopper and reclaimer inlet. Inspect hose for blockage.

7.11.5 Hole worn in flex hose between cabinet hopper and reclaimer inlet. Replace hose as needed.

7.11.6 Reclaimer door open. DO NOT operate unless door is closed.

7.11.7 Exhauster not operating. Make sure exhauster motor is in operation. If it is not, have the motor and circuit checked by a qualified electrician.

7.12 Static Shocks

7.12.1 Cabinet not grounded. Abrasive blasting generates static electricity. The cabinet must be grounded to prevent static buildup. Refer to Section 2.3.

7.13 Dust Leaking from Dust Collector Door

7.13.1 Dust collector door loose. Tighten door wing nuts.

7.13.2 Inspect gasket on dust collector door. Replace if damaged

7.14 Dust Leaking from Exhaust Muffler

7.14.1 Damaged or loose cartridge. Inspect filter cartridge.

7.14.2 Cartridge not seasoned. Refer to Section 6.4 to season cartridge.

7.15 Dust Collector Not Pulsing

7.15.1 Check the pulse-pressure regulator. Make sure it is not too low or turned down to OFF position. Adjust pulse pressure per Section 4.2. If regulator is correctly adjusted and pressure on gauge remains low, check the compressed air supply for a restriction such as a partially closed supply valve.

7.15.2 Make sure the pulse valve and cam follower are operational. Refer to Section 4.7

7.15.3 Inspect the diaphragm in diaphragm pulse valves for damage.

7.15.4 Check for blockage in the tubing between the diaphragm valve and 3-way pulse valve.

7.16 Pulse Is a Steady Stream of Air Instead of a Quick Pulse

7.16.1 Check for a leak or split in the tubing between the diaphragm valve and 3-way pulse valve.

7.16.2 3-way pulse valve or cam follower remains in open position. Refer to Section 4.7.

7.17 Exhauster Not Running

7.17.1 Motor faulty. Have a qualified electrician check for electrical malfunction.

7.17.2 Timer or inlet-solenoid valve malfunctioning. Have a qualified electrician check for electrical malfunction.

7.18 High Reading on Differential Pressure Gauge

7.18.1 Valves may not be pulsing properly. Refer to Section 7.15.

7.18.2 The differential pressure gauge lines or inline dust filter may be plugged with dust. Inspect and clean per Section 6.5.

7.18.3 Pulse pressure may need to be increased. Refer to Sections 4.2 and 5.4.

7.18.4 The filter cartridge may need to be replaced. Refer to Sections 4.2, 5.4, and 6.4.

7.19 No or Low Reading on Differential Pressure Gauge

7.19.1 Make sure low and high-pressure lines are not reversed. Refer to Section 6.5, Figure 16.

8.0 ACCESSORIES AND REPLACEMENT PARTS

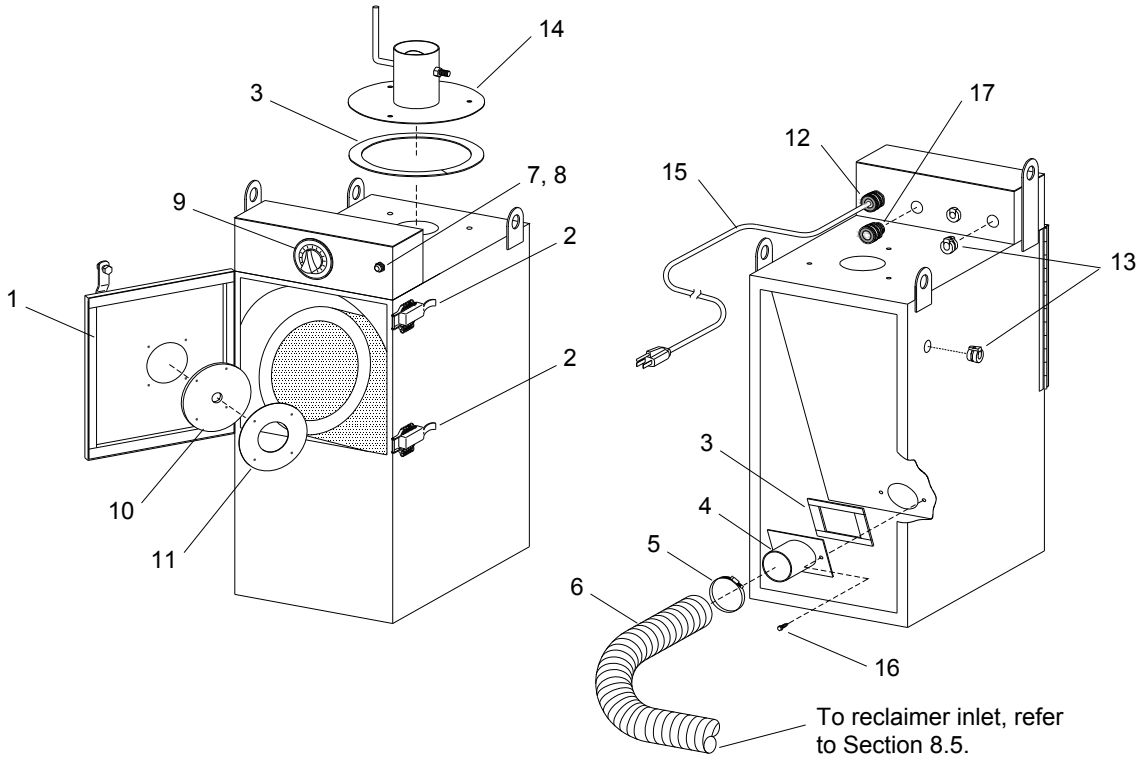
(-) BNP-160 Tumble Blast Cabinet 25861

8.1 Optional Accessories

Tumble basket w/ 1/16" holes 18254
Lock pins (pkg. of 25)
for twist-on air hose couplings 11203
Safety cable, for 1/2" to 1-1/4" OD hose 15012

8.2 Cabinet and Exhauster Assembly – Figure 19

Item	Description	Stock No.
1.	Gasket, door, 5/8" x 1-1/4" adhesive backed 4-feet required	27464
2.	Latch, spring, each	12263
3.	Gasket, 3/32" x 3/4" adhesive backed specify feet required	00192
4.	Adaptor, sump pipe, 2-1/4" flex	25844
5.	Clamp, 2-1/2"	02817
6.	Hose, 2-1/4" light lined flex, 3-ft required	24977
7.	Switch, push button (door interlock)	12119
8.	Dust seal, push button switch	25872
9.	Timer, 60 minute	12180
10.	Gasket, gun mount back plate	11782
11.	Plate, gun mount back	12811
12.	Connector, strain relief, aluminum 0.50″ - 0.625″ cord	11629
13.	Strain relief, Nylon snap-in	13936
14.	Damper, inlet	25860
15.	Cord w/plug, 120-v	11669
16.	Screw, self-drill	12974
17.	Connector, strain relief, aluminum 0.25″ - 0.375″ cord	11631



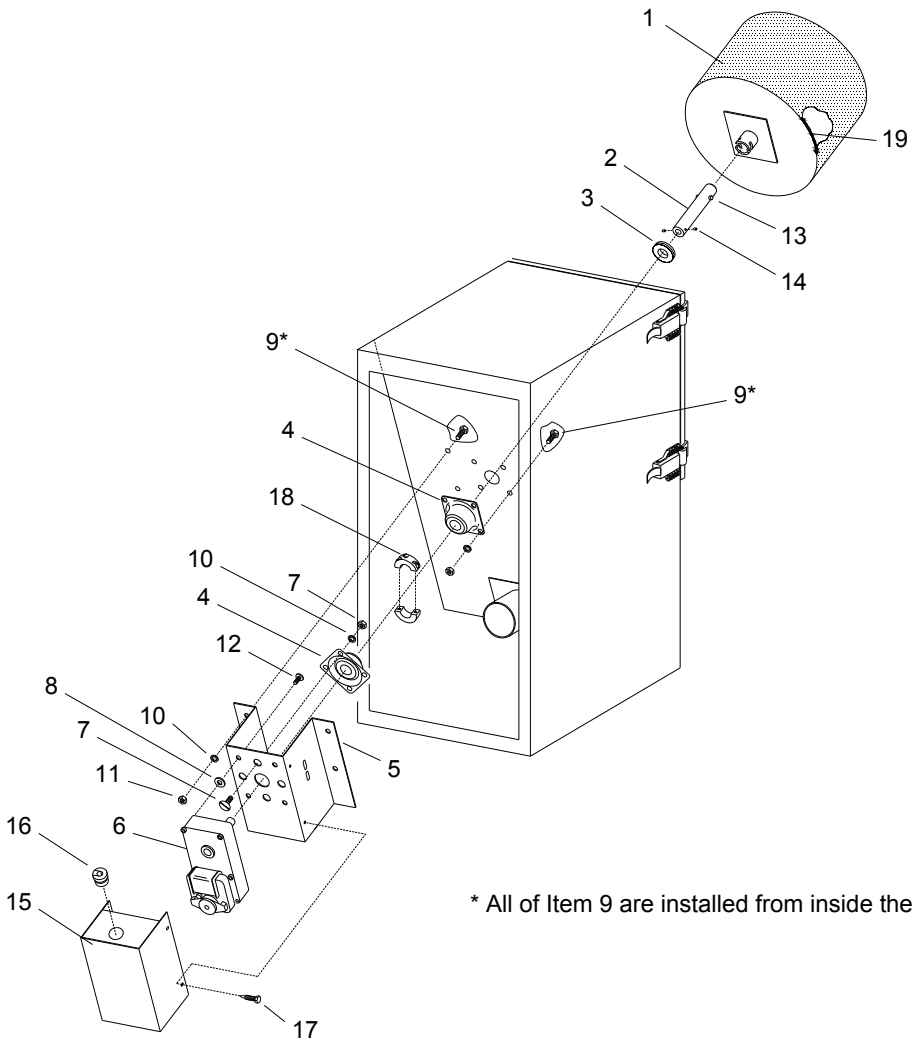
Some items removed or rotated for clarity.

Figure 19

8.3 Basket and Drive Assembly – Figure 20

Item	Description	Stock No.
1.	Basket assembly, includes item 19	
	Standard, with 3/16" diameter holes	12230
	Optional, with 1/16" diameter holes	18254
2.	Shaft, basket drive, includes items 13 & 14	25732
3.	Grommet, rubber	11798
4.	Bearing, 3/4" bore, each	11521
5.	Bracket, drive motor mount	25842
6.	Motor, speed reduced, 3/8" shaft	25864
7.	Bolt and nut, 1/4" NC x 3/4" elevator	03119
8.	Washer, #10 flat (between motor and brkt)	03303
9.	Cap screw, 1/4" NC x 1"	03053
10.	Washer 1/4" lock	03117
11.	Nut, 1/4" NC hex	03111
12.	Screw, #10 x 1/2" truss	12062
13.	Roll pin, 1/4" x 1"	12815
14.	Screw, 1/4" NC x 3/16" set, each (2-req.)	25871
15.	Cover, motor	25879
16.	Strain relief, Nylon snap-in	13936
17.	Screw, 10 x 3/4" self-drilling	12722
18.	Collar, split, shown for reference Refer to Section 8.7 for pulse parts	25866
19.	Liner, 1/4" blue urethane bottom (current) for use with baskets with 5" opening	28158
**	Liner, 1/8" black Neoprene bottom for use with baskets with 7" opening	24972

**For replacement only; cannot be used with current basket design with 5" dimeter opening.

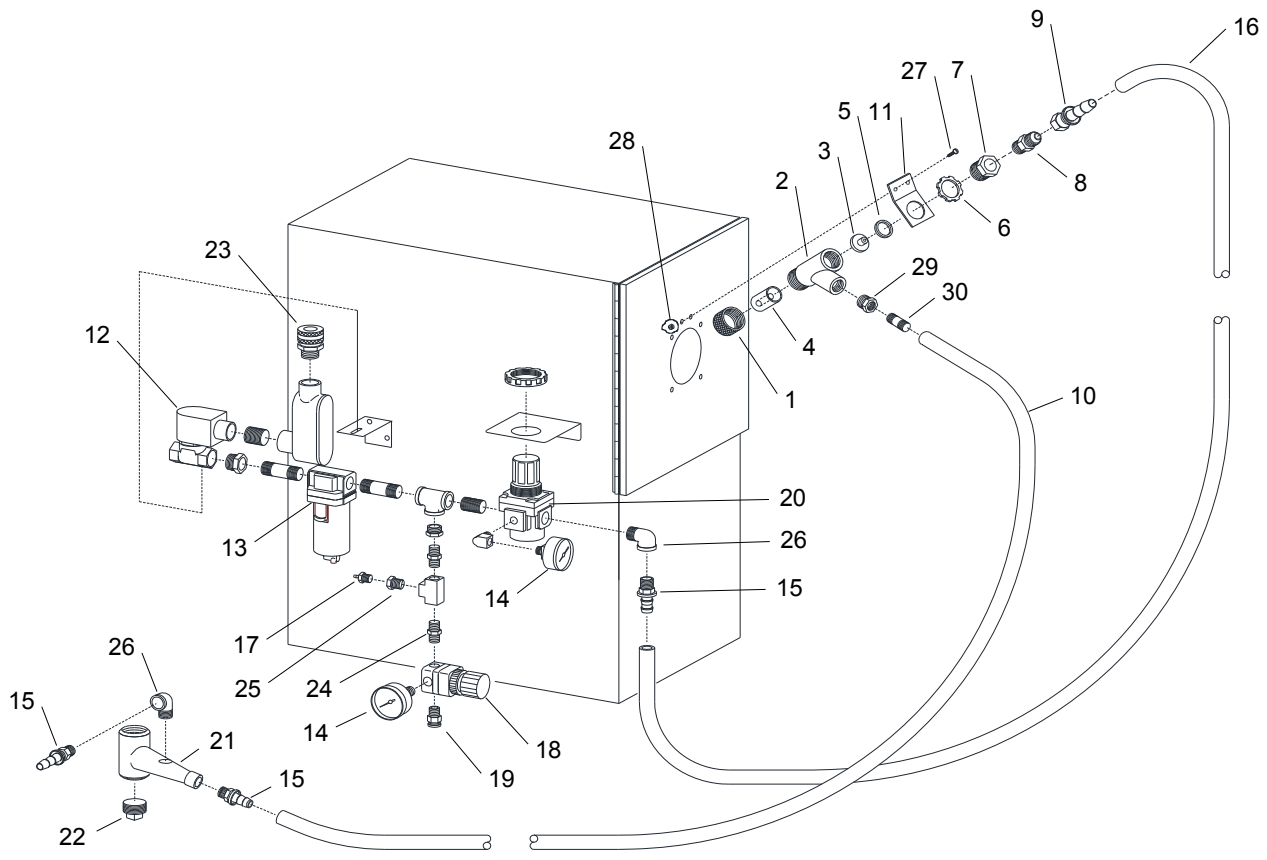


* All of Item 9 are installed from inside the cabinet.

Figure 20

8.4 Gun, Media Feed, and Plumbing Assembly Figure 21

Item	Description	Stock No.
1.	Nut, nozzle-holding	11914
2.	Body, gun	12267
3.	Air jet No. 5	11952
4.	Nozzle	
	ceramic No. 5	11930
	tungsten carbide, No. 5 (standard)	13118
	boron carbide, No. 5	11935
5.	Washer	04396
6.	Nut, 3/4" lock	12807
7.	Bushing, 3/4" x 3/8"	12748
8.	Adaptor, 3/8" male NPT x 1/2" male flare	11726
9.	Fitting, hose, 1/2" barb x 1/2" fem. swivel	15002
10.	Hose, 1/2" clear media, 6-ft. required	12476
11.	Bracket, gun mount	12806
12.	Valve 1/2" NPT 2- way w/115-v solenoid	12191
13.	Filter, 3/8" NPT, manual drain	25870
14.	Gauge, 1/8" cbm (replacement)	01908
15.	Fitting, hose, 3/8" NPT male x 1/2" barb	06369
16.	Hose, 1/2" air, 4-ft. required	12472
17.	Fitting, straight, 1/8" NPT x 1/8" barb	11732
18.	Regulator, 1/4" NPT pressure w/gauge	12050
19.	Fitting, straight 1/4" NPT x 3/8" tube	11736
20.	Regulator, 3/8" NPT pressure w/gauge	25869
21.	Metering valve body	11532
22.	Plug, metering valve	12011
23.	Connector, strain relief, alum.	11631
24.	Nipple, 1/4" NPT brass hex	02808
25.	Bushing 1/4" NPT x 1/8" NPT brass	02010
26.	Elbow, 3/8" NPT x 90° St., brass	03595
27.	Screw, #10 x 1/2" truss	12062
28.	Nut, 10-24 lock	12731
29.	Bushing, 3/8" NPT x 1/4" NPT	12818
30.	Nipple, 1/4" NPT x 1-1/2" galv.	11911

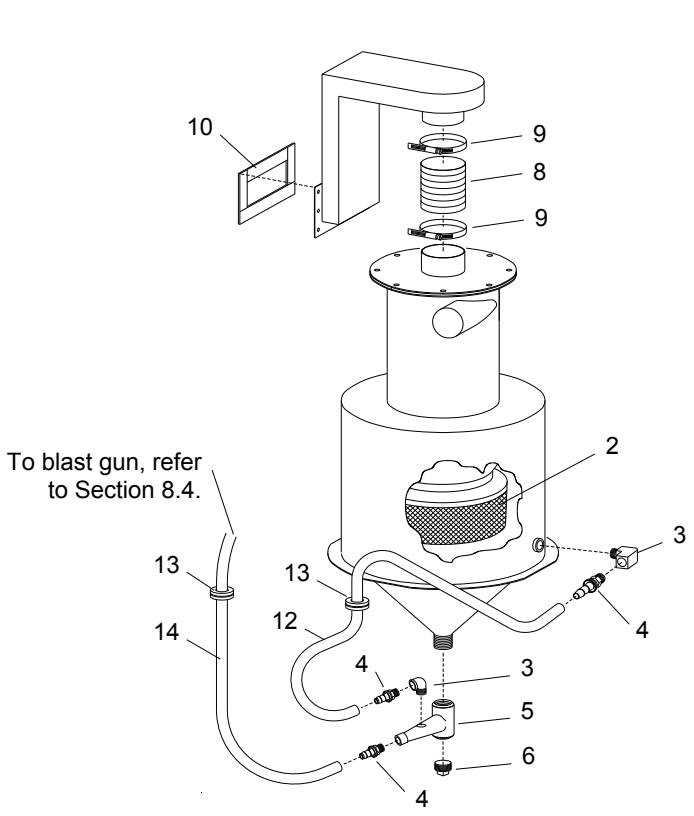


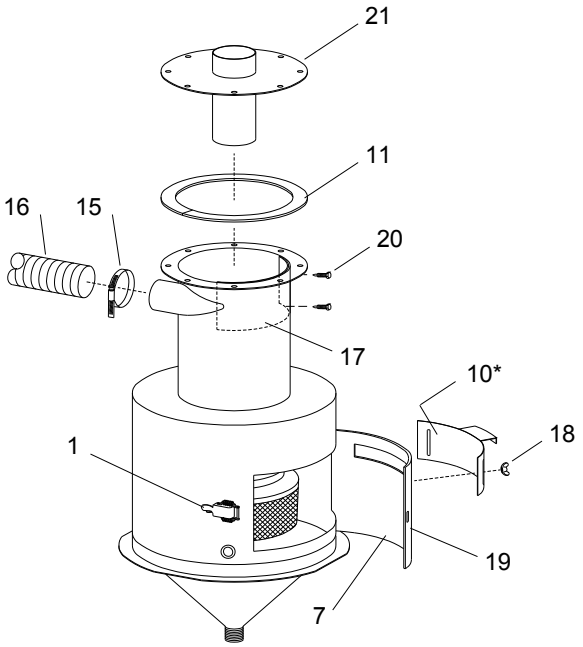
Some items removed or rotated for clarity.

Figure 21

8.5 Reclaimer Assembly – Figure 22

Item	Description	Stock No.
1.	Latch, spring assembly	12263
2.	Screen assembly, 8-mesh	21265
3.	Elbow, 3/8" NPT street, brass	03595
4.	Fitting, hose, 3/8" NPT male x 1/2" barb	06369
5.	Body, metering valve	11532
6.	Plug, 1" Nylon pipe	12011
7.	Gasket, slotted door	24974
8.	Hose, 3" unlined flex, 1-ft minimum	25873
9.	Clamp, 3" OD, each	02816
10.	Gasket, 1/8" x 2" adhesive backed specify feet required	13089
11.	Gasket, 5/16" x 1" adhesive backed 3-feet required	00187
12.	Hose, 1/2" air, 3-feet required	12472
13.	Grommet, rubber	11798
14.	Hose, 1/2" clear media, 6-ft Required	12476
15.	Clamp, 2-1/2"	02817
16.	Hose, 2-1/4" light lined flex, 3-ft required	24977
17.	Wear plate, reclaimer	24969
18.	Nut, 1/4" NC wing	03113
19.	Door with slide, order gaskets separately	24967
20.	Screw, 10 x 3/4 self-drilling	12722
21.	Adaptor, reclaimer outlet pipe	25852





* Apply to full surface of door slide then cutout slot openings.

Some items removed or rotated for clarity.

Figure 22

8.6 Dust Collector Assembly – Figure 23
Refer to Section 8.7 for pulse components

Item	Description	Stock No.
1.	Filter cartridge 8" x 16" w/gasket	25874
2.	Gasket, 5/16" x 1" adhesive backed 4-feet required	00187
3.	Blower/motor assembly	24975
4.	Band, blower motor	16409
5.	Muffler, blower	24976
6.	Valve, 3/4" NPT diaphragm pulse	25867
7.	Elbow, 1/8" NPT brass st	03993
8.	Nipple, 1/8" NPT hex	01962
9.	Valve, 3 way	12202
10.	Actuator, air pilot	19123
11.	Fitting, straight 1/8" NPT x 1/8" barb	11732
12.	Petcock, drain	01993
13.	Fitting, straight 1/4" NPT x 3/8" tube	11736
14.	Clamp, 4"	11577
15.	Hose, 4" unlined flex, 1-ft minimum	12447
16.	Dust drum, 3.5 gallon	23417
17.	Lid and locking ring, dust drum	23419
18.	Gasket, 3/16" x 1" adhesive backed specify feet required	00186
19.	Washer, 1/4" flat	03116
20.	Washer, 1/4" lock	03117
21.	Nut, 1/4" NC wing	03113
22.	Washer, 5/16" flat	03216
23.	Washer, 5/16" lock	03217
24.	Nut, 5/16" NC hex	03211
25.	Washer, 3/8" flat	03317
26.	Washer, 3/8" lock	03318
27.	Nut, 3/8" NC wing	03313
28.	Liners, drum, pack of 5	28621
29.	Brushes, blower motor, not shown	28157

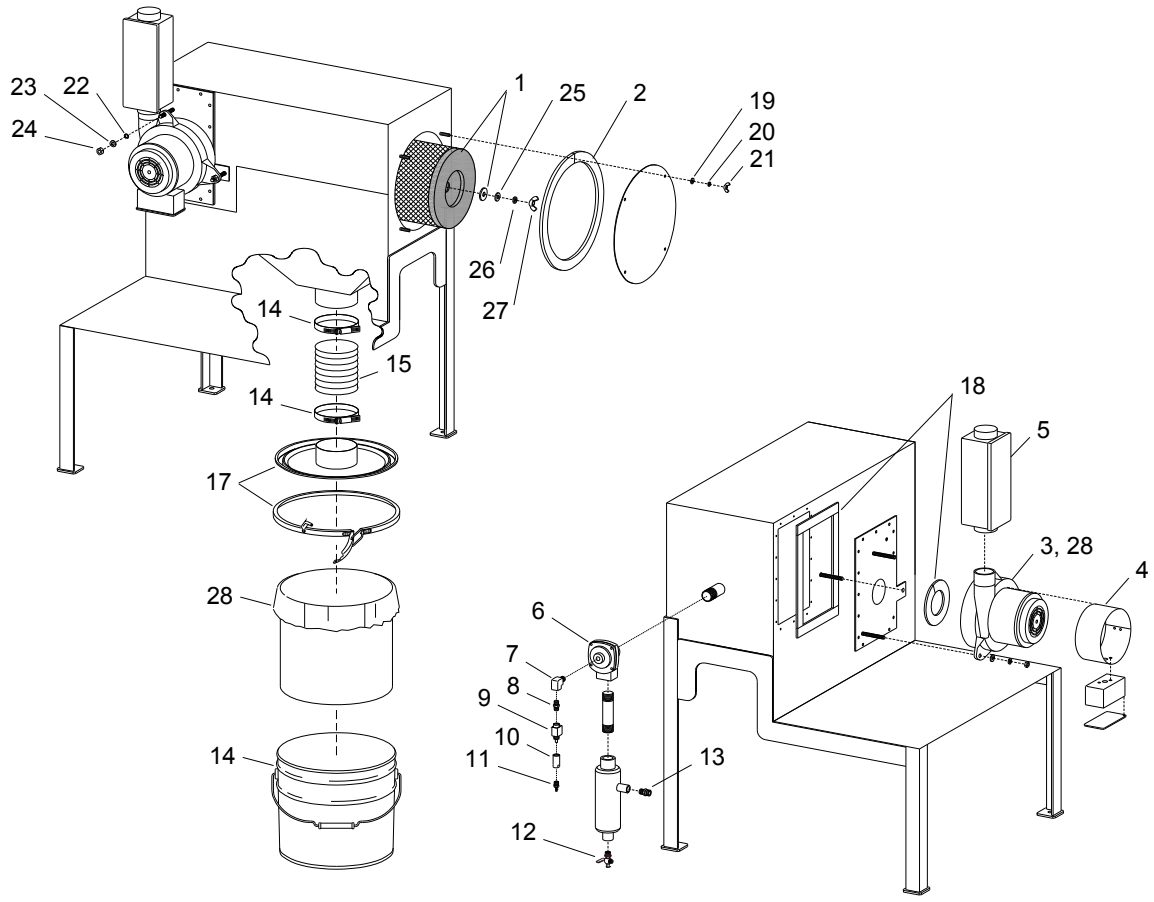


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Figure 23

8.7 Dust Collector Pulse and Plumbing – Figure 24

Item	Description	Stock No.
1.	Collar, split	25866
2.	Screw, 10-24 x 1/2	03886
3.	Cam follower	19576
4.	Roll pin, 1/8", each, two required	20479
5.	Bracket, pulse valve	25863
6.	Valve, 3-way	12202
7.	Fitting, elbow 1/8" NPT x 1/8" barb	11733
8.	Tubing, 1/8" urethane, specify ft. required	12475
9.	Valve, 3/4" NPT diaphragm pulse	25867
10.	Elbow, 1/8" NPT brass st	03993
11.	Nipple, 1/8" NPT hex	01962
12.	Actuator, air pilot	19123
13.	Fitting, straight 1/8" NPT x 1/8" barb	11732
14.	Fitting, straight 1/4" NPT x 3/8" tube	11736
15.	Gauge, differential pressure	25868
16.	Coupling, 1/8" NPT galv.	13232
17.	Filter, inline, 1/4" tube	23415
18.	Bushing 1/4" NPT x 1/8" NPT brass	02010
19.	Tubing, 3/8" OD poly, 3-ft. required	12478

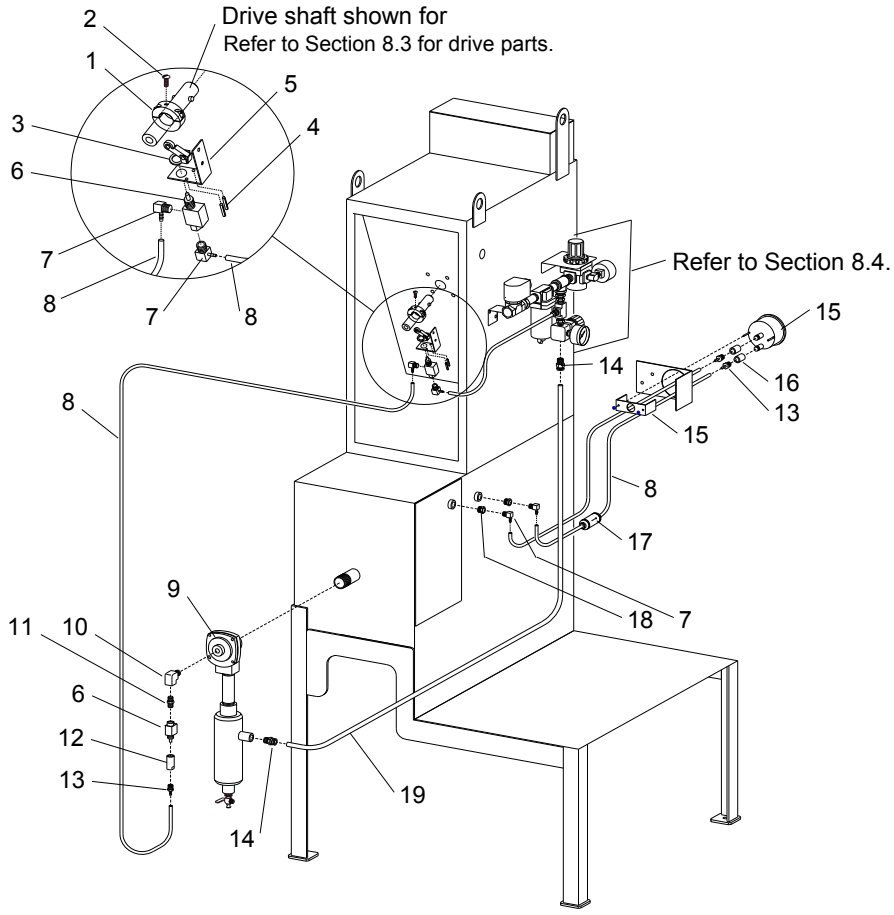

Figure 24