

BNP 162, 164 and 166 TUMBLE BLAST CABINETS



Clemco Industries Corp. • One Cable Car Drive • Washington, MO 63090
Phone: (636) 239-4300 • Fax: (636) 239-0788
Email: info@clemcoindustries.com
www.clemcoindustries.com

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

The products described in this material, and the information relating to those products, is intended for knowledgeable, experienced users of abrasive blasting equipment.

No representation is intended or made as to the suitability of the products described herein for any particular purpose of application. No representations are intended or made as to the efficiency, production rate, or the useful life of the products described herein. Any estimate regarding production rates or production finishes are the responsibility of the user and must be derived solely from the user's experience and expertise, and must not be based on information in this material.

The products described in this material may be combined by the user in a variety of ways for purposes determined solely by the user. No representations are intended or made as to the suitability or engineering balance of the combination of products determined by the user in his selection, nor as to the compliance with regulations or standard practice of such combinations of components or products.

It is the responsibility of the knowledgeable, experienced users of the products mentioned in this material to familiarize themselves with the appropriate laws, regulations and safe practices that apply to these products, equipment that is connected to these products, and materials that may be used with these products.

It is the responsibility of the user to insure that proper training of operators has been performed and a safe work environment is provided.

Our company is proud to provide a variety of products to the abrasive blasting industry, and we have confidence that the professionals in our industry will utilize their knowledge and expertise in the safe efficient use of these products.

OWNER'S MANUAL

1.0 INTRODUCTION

1.1 Scope of Manual

1.1.1 These instructions cover set-up, operation, maintenance, troubleshooting, optional accessories, and replacement parts for BNP 160's series suction tumble blast cabinets, all with reclaimer and push-through dry filter and motor drive options. A supplemental manual is provided for the optional reverse-pulse dust collector.

1.1.2 These instructions also 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 Z535.4-1998, 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 the user of this equipment of potential personal injury hazards.

Obey all safety messages that follow this symbol to avoid possible injury or death.

CAUTION

Caution used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

CAUTION

Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

WARNING

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

DANGER

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

1.3 General Description

1.3.1 BNP tumble cabinets blasts batches of small parts, using fixed nozzles and a rotating barrel.

1.3.2 Tumble cabinets consist of three major components:

1. Cabinet Enclosure
2. Reclaimer
3. Dust Collector

See Figure 1 for arrangement of components with a dry filter. The model shown is a 164 with a 600 cfm reclaimer and dry filter. Figure 2 shows a free standing 900 cfm reclaimer connected to a reverse-pulse dust collector.

1.3.3 The load capacity of the barrel depends on the model. Standard cabinets are supplied as follows:

MODEL	BNP-162	BNP-164	BNP-166
No. of Guns	two	four	six
Max. volume	1 cu ft	2 cu. ft.	3 cu. ft.
Max. weight	100 lb.	200 lb.	300 lb.
Reclaimer cfm	300 or 600	600 or 900	900

NOTE: The reclaimer size is determined by the cabinet weldment; therefore, reclaimer sizes are not interchangeable. 300 cfm and 600 cfm reclaimers are attached to the cabinet enclosure, 900 cfm reclaimers are free standing.

1.4 Theory of Operation

1.4.1 When parts are loaded into the barrel, the air supply and exhaust are turned "on", and the cabinet door is closed, the cabinet is ready for operation by engaging the timer located in the electrical panel mounted on top of the cabinet. Starting the timer causes air to flow through the blast guns. Air moving through the guns draws media into the blast gun mixing chamber. The media mixes with the air and is propelled out the nozzles. As the barrel rotates, the parts tumble in the blast

stream ensuring that all parts and surfaces are uniformly cleaned. Some of the blast media remains in the barrel to cushion the parts as they tumble. A portion of the blast media, along with fines, dust, and by-products generated by blasting, flows through the adjustable slide gates into the cabinet hopper. These particles are drawn into the reclaimer for separation. Dust

and fines are first separated from the reusable blast media. Next the media is screened of oversize particles, and returned to the reclaimer hopper for reuse. Dust and fines are drawn through the reclaimer into the dry filter or dust collector, which traps the dust and discharges clean air. Blasting automatically stops when the timed cycle is completed.

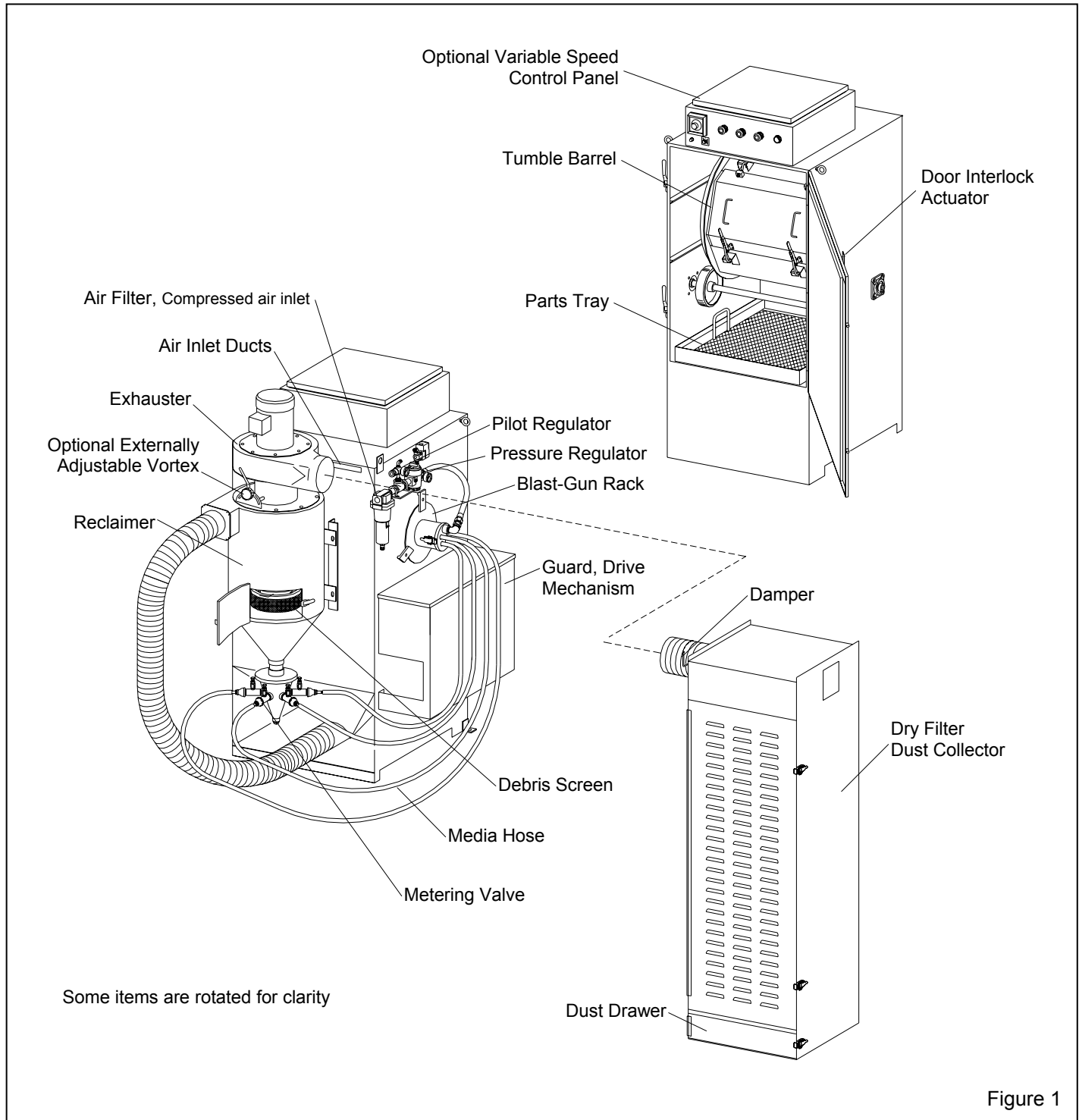


Figure 1

1.5 Dust Collector Options

▲ WARNING

Prolonged exposure to any dust could 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, could cause serious respiratory injury or death. Identify all materials that are to be removed by blasting. Use reverse-pulse dust collectors with HEPA after-filters if lead coating or any other toxic materials are being removed by the blasting process. Do not use dust collectors with simple cloth filters for those applications.

1.5.1 Dry Filter: Uses tubular filters which trap dust on their inner surfaces. A dry filter is for use with light to moderate dust contamination. The filters must be shaken manually approximately every twenty minutes, and the dust drawer emptied regularly. This type of dust collection must never be used in applications which generate toxic dust.

1.5.2 Reverse Pulse Dust Collector: The most efficient dust collector option. Cartridge filters are automatically cleaned by a periodic pulse of compressed air. This type of dust collector used with the optional HEPA filter must be used in applications in which toxic dust is generated. See separate manual for operation of reverse-pulse dust collectors.

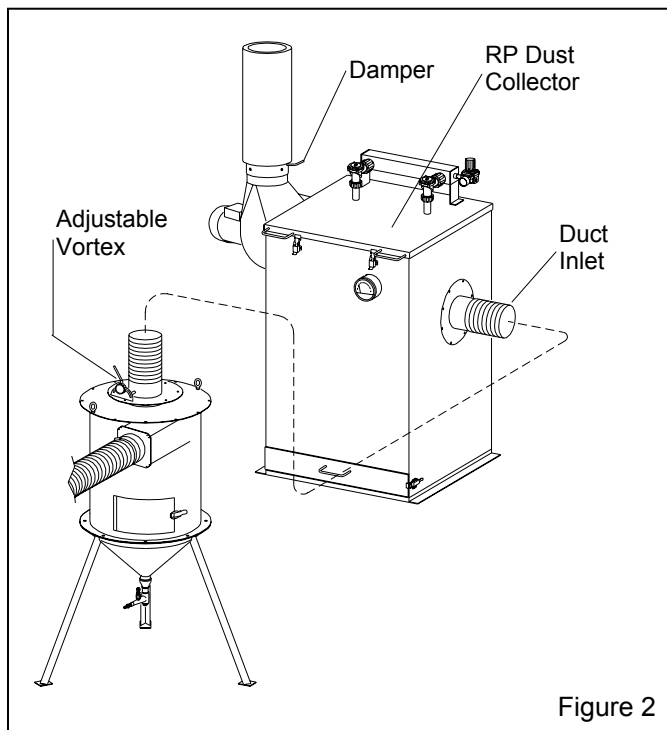


Figure 2

1.5.3 HEPA Filter: Optional HEPA after-filters provide additional filtration and, are available for use with reverse-pulse collector only. HEPA filters must be used when removing lead coatings or any other toxic materials.

1.6 Nozzle Options

1.6.1 Ventilation requirements limit standard cabinets to 5/16" nozzle and No. 5 (5/32" orifice) air jets. In some applications, where compressed air is limited, No. 4 (1/8" orifice) air jets may be used, but blast rates will decrease accordingly. See Section 1.8. Unless otherwise specified at the time of order, cabinets are supplied with ceramic nozzles. More durable tungsten carbide and boron carbide nozzles are available and are shown under Accessories and Replacement Parts in Sections 9.1 or 9.3. Use boron carbide nozzles when blasting with aggressive media, such as those listed in Section 1.7.4.

1.7 Media

1.7.1 BNP Tumble Blast Cabinets utilize most common reusable media 30 mesh to 180 mesh, that is specifically manufactured for dry blasting (glass bead and aluminum oxide are most commonly used). The usable media size range depends on the number of nozzles and reclaimer cleaning rate. Several factors affecting the reclaimer cleaning rate include: reclaimer size, blast pressure, media/air mixture, media friability, contamination of parts being cleaned, and humidity. Media sizes noted are guidelines only, and are based on standard nozzles and average conditions.

Media finer than those recommended may increase carryover to the dust collector. Using media 200 mesh and finer will usually require the addition of the optional, externally adjustable vortex cylinder. See Section 5.5. The vortex cylinder is standard on pull-through systems (cabinets with reverse-pulse dust collectors). Media coarser than those recommended may be too dense for the reclaimer to recover from the cabinet hopper.

1.7.2 Steel: Steel grit or shot should not be used with standard tumble cabinets.

1.7.3 Sand and Slag: Sand should never be used because of the hazards of using media containing free silica. Slags are not recommended because they rapidly break down.

1.7.4 Aluminum Oxide, Silicon Carbide, and Garnet: Aggressive media such as these may be used but consideration should be given to accelerated wear on all parts of the cabinet, reclaimer, nozzle and hoses, which come in contact with the media. When these

media are used extensively, use boron nozzles, a full rubber lined reclaimer and RP dust collector.

1.7.5 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 lumps.

1.7.6 Fine-mesh Media: The optional adjustable vortex cylinder should be installed when using 200-mesh and finer media. NOTE: The adjustable vortex cylinder is standard on pull-through systems (cabinets with reverse-pulse dust collectors). When using very fine media (200 mesh and finer), the inlet baffle of the reclaimer may also need to be removed. Consult the factory before proceeding with this option.

1.7.7 Lightweight Media: Plastic media and most agricultural media are not recommended with the tumble cabinets; They are usually too light for suction blast applications, and may bridge in the barrel and hopper.

1.8 Compressed Air Requirements

1.8.1 The size of the compressor required to operate the cabinet depends on the size of air jet*, the number of guns and blasting pressure. See table in Figure 3 to determine cfm requirements. Consult with a compressor supplier for suggested compressor size based on the air consumption.

NOTE: A separate air line is required for the optional reverse pulse dust collector.

Model	Jet	Nozzles	CFM	PSI
162	*1/8"	2	42	80
162	5/32"	2	64	80
164	*1/8"	4	84	80
164	5/32"	4	128	80
166	*1/8"	6	126	80
166	5/32"	6	192	80

Air Consumption in cfm

*1/8" jets decrease blast rates by approximately 30%.

Figure 3

1.8.2 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 fine-mesh media are used. Moisture causes media to clot and inhibits free flow through the feed assembly. If moisture problems persist, an air dryer may be required.

1.9 Electrical Requirements

1.9.1 Electrical requirements depend on the size and type of motors and electrical package. Electrical schematics are packed inside the control panel. Refer to the schematic for electrical requirements.

2.0 INSTALLATION

2.1 General Installation Notes

2.1.1 See Figure 1 (and Figure 2 for optional reverse-pulse collector) 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 parts. Provide enough clearance in front of the dust collector to remove the dust drawer without tipping. Place free-standing reclaimers directly behind the cabinet with hose connections toward the cabinet with as few bends as possible. Determine the best location, and position all units before final assembly.

2.2 Level Cabinet Enclosure

2.2.1 Level the cabinet by using shims as necessary under cabinet corners. A cabinet that is not level may have problems with door closing and barrel tracking.

2.3 Connect Conveying Hose

2.3.1 Connect flexible conveying hose between the cabinet hopper transition and reclaimer inlet adaptor. It is easier to slip the hose over the adaptors and create a tighter seal if the first two or three inches of wire are removed from the inside of the hose. Use care not to damage the hose. Clamp flex hose securely in position with worm clamps provided. NOTE: The hose wire helps dissipate static electricity in the conveying hose, and also helps ground each segment. In order for the hose wire to dissipate static electricity, the wire must touch the metal of each segment.

2.4 Connect Compressed Air Supply Line(s)

2.4.1 Install an isolation valve at the air source to enable depressurization for service. Connect an air line from the air source to the air filter inlet, located at the upper side of the cabinet. For best blasting performance, size the air line as follows:

BNP-162 1" ID or larger
 BNP-164 1-1/4" ID or larger
 BNP-166 1-1/2" or larger
 A separate air line is required for the RP dust collector.

WARNING

If twist-on type air hose couplings are used, they must be secured by safety pins or wires to prevent accidental disconnection while under pressure. Hose disconnection while under pressure could cause serious injury.

2.5 Ground Cabinet

2.5.1 To prevent static electricity build up, attach an external grounded wire from an earth ground to the grounding lug on the rear of the cabinet.

2.6 Connect Electrical Service

WARNING

Shorting electrical components could result in serious electrical shocks, or equipment damage. All electrical work and any work done inside the panel must be performed by a qualified electrician, and comply with applicable codes.

NOTE: Schematics are packed in the electrical panel. After wiring is completed, keep the schematic with the manual for future reference and for electrical replacement parts.

2.6.1 As much wiring as possible has been completed at the factory. The electrician needs to provide service to the motor starter in the electrical panel mounted on the cabinet, and connect the conduit and wiring from the starter to the motor on free standing reclaimers. Refer to the schematic packed in the panel. NOTE: The user must provide conduit and wiring from the starter to the motor for RP Collectors.

2.6.2 Whether voltage is 230 or 460 is determined at time of order, and heaters are provided accordingly.

2.6.3 Supply service from the user's disconnect to the electrical panel as shown on the schematic.

2.6.4 Check the rotation of the motors. To check, jog the exhauster starter (momentarily turn switch on and off). This will cause the motor to rotate slowly. Look through the slots in the fan housing on top of the motor where rotation of the fan can easily be observed. The exhauster fan should be rotate clockwise when viewed

from the fan end of the motor. The tumble barrel should rotate clockwise when viewed from the gear reducer side.

WARNING

Do not look into the reclaimers exhausters outlet while the paddle wheel is turning. Injury to the eye or face could occur from objects being ejected from the exhausters.

2.7 Dry Filter Dust Collector. See separate manual for Reverse-Pulse Dust Collector.

2.7.1 The dry filter duct inlet adaptor can be converted to the left or right. If it is more convenient to have the inlet on the opposite side, switch the inlet adaptor for the blank cover.

2.7.2 Connect the flexible exhaust hose between the reclaimers outlet and dry filter inlet adaptor. It is easier to slip the hose over the adaptors, and create a tighter seal if the first two or three inches of wire are removed from the inside of the hose. Use care not to damage the hose. Secure the hose with worm clamps. NOTE: The hose wire helps dissipate static electricity in the conveying hose, and also helps ground each segment. In order for the hose wire to dissipate static electricity, the wire must touch the metal of each segment.

3.0 FIELD INSTALLED ACCESSORIES

3.1 Manometer

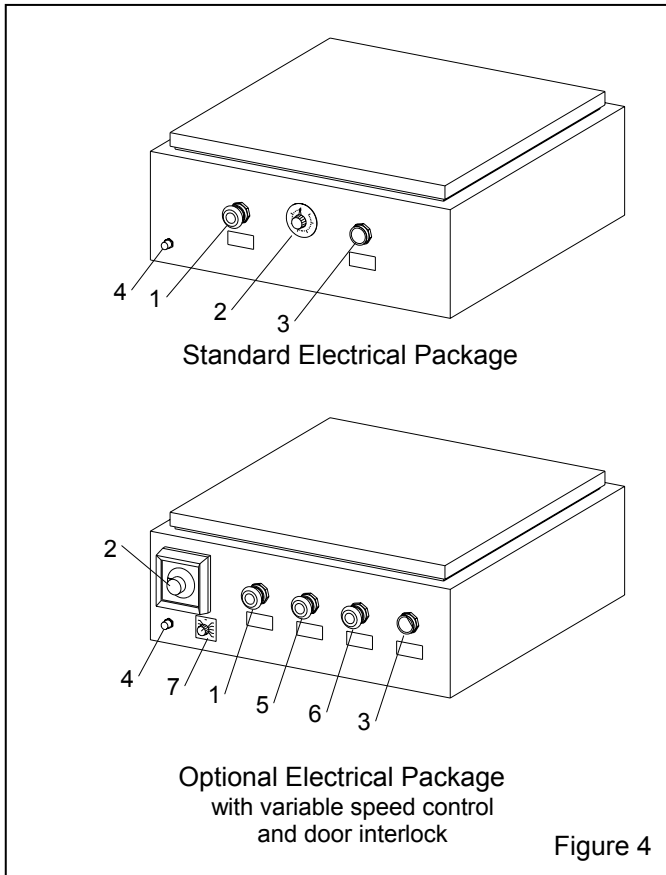
3.1.1 Constant static pressure is necessary for precise separation, as the reclaimers efficiency is accomplished by a centrifugal balance of particle weight and size. The air balance and static pressure are set by adjusting the outlet damper. The manometer measures static pressure. Use the instruction sheet provided with the manometer, for installation and operation instructions. The optional manometer kit is listed in Section 9.1.

3.2 Drum Divider Kit

3.2.1 Drum dividers split the barrel chamber into separate compartments. This permits simultaneous blasting of different parts. Barrels should not be divided into compartments containing less than two nozzles.

4.0 OPERATION

4.1. Control Panel Operation, Ref. Figure 4



Item Description and Function

1. **Exhauster Switch:** Pulling out the button starts the exhauster, pushing in the button stops the exhauster. Other controls will not operate unless the exhauster is running.
2. **Timer:** Sets duration of the blast cycle. The timer switch also starts the blast cycle on standard electrical package. Blasting automatically stops when the timer times out. Note: Optional electrical package timer does not require resetting after blasting, unless the blasting duration changes.
3. **Barrel Jog:** The exhauster must be on before engaging the switch. Pressing the momentary switch rotates the barrel. The barrel continues to rotate as long as pressure is maintained on the switch.
4. **Door Interlock:** (Optional Package Only) When the door is open, blast guns are disengaged, preventing blasting.

The following controls are supplied with the optional electrical package only.

5. **Sequence Switch:** When the timer and gun controls are set, blasting starts and stops by pulling and pushing the sequence switch.
6. **Guns switch:** This switch engages and disengages the blast guns. If the switch is pulled out "on", blasting starts when the sequence switch is engaged. If the switch is pushed in "off", all tumble operations except blasting starts when the sequence switch is engaged.
7. **Speed Control:** Controls the rotation speed of the tumble barrel.

4.2 Media Loading and Unloading

4.2.1 **Media Loading:** With the exhauster off, add clean dry media, by pouring it through the reclaimer fill door. Do not fill past the cone on the reclaimer. **Do not pour media directly into the cabinet hopper, as overfilling may occur.** Overfilling will result in media carryover to the dust collector and possible blockage in the conveying hose. Refill only after all media has been recovered from the cabinet.

The approximate amount of media to charge the system is as follows:

300 CFM Reclaimer	50 Lb. (.5 cu. ft.) Media
600 CFM Reclaimer	75 Lb. (.75 cu. ft.) Media
900 CFM Reclaimer	100 Lb.(1 cu. ft.) Media

4.2.2 **Media Unloading:** To empty the cabinet and reclaimer of media, allow all media to be recovered from the cabinet, turn off the exhauster and place an empty container under the metering valve manifold (or metering valve on 162 units). Unscrew the plastic plug, permitting media to flow into the container. If media doesn't flow, it has caked. Open the fill door and stir media until it starts to flow. Replace the plug when the reclaimer is empty.

4.3 Loading and Unloading Parts

- 4.3.1 Open the cabinet door, and pull the exhauster button switch to start the exhauster. Press the barrel jog button until the barrel loading door is facing forward.
- 4.3.2 Unlatch the barrel door clamps and remove the door.
- 4.3.3 Parts must be free of oil, water, grease, or other contaminants that will cause media to clump, or clog filters.

4.3.4 Load parts through the barrel door. Do not overload the barrel. The following table shows maximum load capacity in weight and cubic feet.

MODEL	BNP-162	BNP-164	BNP-166
Max. volume	1 cu ft	2 cu. ft.	3 cu. ft.
Max. weight	100 lb.	200 lb.	300 lb.

4.3.5 Check gun rack angle adjustment per Section 5.2.

4.3.6 Close the barrel door and latch it securely.

4.3.7 Close the cabinet door. Be certain door is latched securely. Optional door interlock system will prevent blasting.

4.4 Blasting Operation

CAUTION

- **Always close cabinet, reclaimer and dust collector doors before blasting. Keep all doors closed during blasting.**
- **After blasting, keep doors closed and exhauster on until the cabinet is clear of all airborne dust.**
- **Stop blasting immediately if dust leaks are detected.**

4.4.1 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.

4.4.2 Turn on the exhauster by pulling the exhauster button.

4.4.3 Adjust the pilot pressure regulator located on the top, left side of the cabinet, to the required blast pressure per Section 5.1.

4.4.4 Load parts, set gun rack angle. See Section 4.3.

4.4.5 For optional electrical package only, set timer blast duration.

4.4.6 Start the blast cycle as follows:

Standard Electrical Package:

1. Set timer for blast duration. Blasting begins when timer is set.

Optional electrical package:

1. Set Speed Control
2. Pull Gun Switch "on"
3. Pull Sequence Switch "on".

WARNING

Shut down the cabinet immediately if dust discharges from the collector or bag. Make sure that the filters are correctly seated and not worn or damaged. Prolonged breathing of any dust could result in serious lung disease or death. 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 material safety data sheet for the blast media.

4.4.7 Check media flow per Section 5.3.

4.5 Stop Blasting

4.5.1 Blasting and barrel rotation stop when the timer cycle is complete.

4.5.2 Allow exhauster to run awhile before opening the door and run exhauster until parts are unloaded.

4.5.3 Press the barrel jog button until the barrel loading door is facing forward, then completely remove the barrel door.

4.5.4 Parts may be unloaded through the barrel door, or the barrel may be jogged, until parts empty into the parts tray.

4.5.5 Remove parts from the tray. The parts tray may be installed with the open end toward the front or back, place it to most easily handle the parts.

4.5.6 Reload the barrel, or shut off the air supply valve, drain the air filter, and switch off the exhauster.

5.0 ADJUSTMENTS

5.1 Blasting Pressure

5.1.1 The pilot regulator, located on the upper side 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 used for

delicate work. In all cases, highest production can be achieved only when pressure is carefully monitored.

5.1.2 To adjust, unlock the knob, and turn it clockwise to increase pressure or counter-clockwise to decrease pressure. Pressure will usually drop from closed-line pressure when blasting starts. Once operating pressure is reached, lock the knob to maintain the setting.

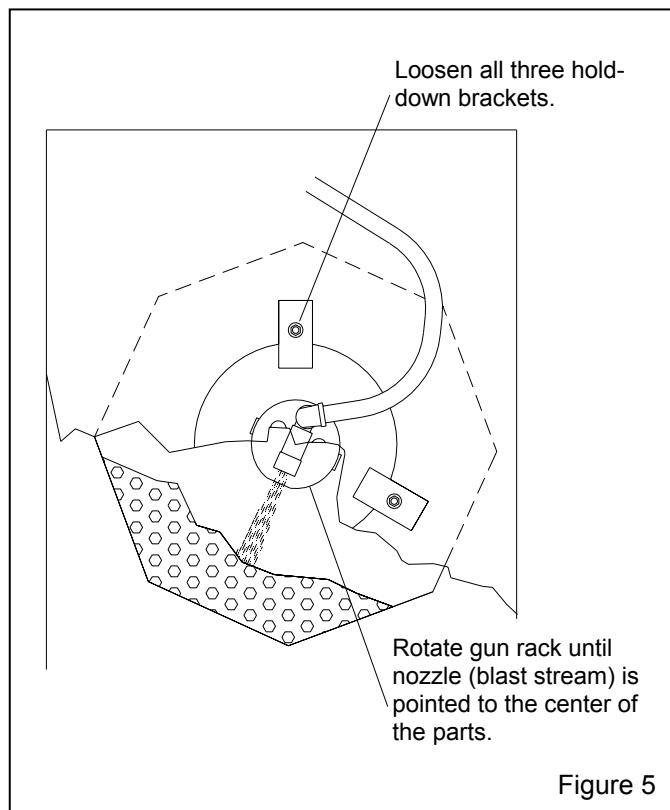
5.2 Gun Rack Angle, Ref. Fig. 5

CAUTION

The gun rack must be adjusted to direct the blast stream toward the parts. If the rack is not correctly adjusted, the tumble barrel will wear prematurely and parts will require longer blast cycles.

5.2.1 Load parts into the barrel; close the barrel door; and jog the barrel until it has rotated one revolution. This places the parts at the angle in which they tumble.

5.2.2 Open the door and check the alignment of the guns by placing a dowel, pencil, or similar object into a nozzle barrel.



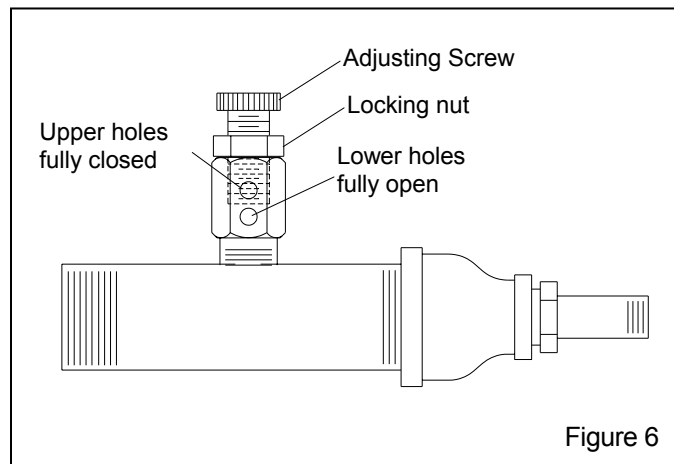
5.2.3 If the guns do not point toward the center of the parts, loosen the three gun rack hold-down brackets and rotate the rack until the nozzles point to the center of the parts.

5.2.4 Remove the dowel and tighten the hold-down brackets to maintain the setting.

5.3 Media/Air Mixture, Figure 6

5.3.1 Media should flow smoothly and evenly through the hoses. Flow can be observed through the clear metering valve body.

5.3.2 If media does not flow smoothly, loosen the locking ring, 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 6. This adjustment is a starting point.



5.3.3 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 to maintain the setting.

5.3.4 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 tight to maintain the setting.

5.4 Static Pressure

5.4.1 Correct static pressure varies with size of reclaimer and the size, weight and type of media.

5.4.2 Adjust static pressure by opening (handle horizontal) or closing (handle vertical) the damper. The damper is located on the inlet on dry filters, and on the outlet of reverse pulse dust collectors. If the damper is not opened enough, the reclaimer will not remove fines, resulting in dusty media and possible media blockage in the conveying hose. If the damper is opened too far, it may cause carryover (usable media carried into the dust collector) and result in excessive media consumption. Open only as far as necessary to obtain a balance of dust removal without media carryover.

5.4.3 A manometer is useful when adjusting or monitoring static pressure. The manometer kit is listed under Optional Accessories in Section 9.1. The following are static pressure starting points for given media. Static pressure may need to be lower with finer media, higher with coarser media.

Glass Bead No. 8 to 13	2-1/2 - 3"
Alox. 60 & coarser	4 - 5"
Alox. 80 & finer	2-1/2 - 3"

5.4.4 If the damper has been adjusted and carryover or excessive dust in the media continues to be a problem, an optional adjustable vortex cylinder, (standard on pull through reclaimers), may help retain media. This option is usually required only when using 200 mesh and finer media, or lightweight media. See Section 5.5, and reclaimer accessories in Section 9.8.

5.5 Optional Externally Adjustable Vortex Cylinder (standard on pull-through reclaimers). For use with fine-mesh or lightweight media.

5.5.1 The adjusting lever for the vortex cylinder is mounted on the spacer between the reclaimer body and exhauster housing. Start with the lever in the vertical position. Before adjusting the vortex cylinder, adjust the damper on the dust collector to increase or decrease static pressure per Section 5.4. Once the damper has been adjusted, adjust the cylinder as follows.

5.5.2 **Dusty Media:** If the reclaimer is not removing sufficient quantities of dust, raise the cylinder by moving the lever left toward "COARSE", in 1/4" increments at the indicator plate. Do not adjust again until the media has gone through several cycles, to be certain further adjustment is required.

5.5.3 **Media Carryover:** If too much usable media is being carried to the dust collector, lower the vortex cylinder by moving the lever right toward "FINE", in 1/4" increments at the indicator plate. Note: If the cylinder is lowered too far, the reclaimer will again begin to allow usable media to be carried over, and cause abnormally high static pressure.

5.5.4 When using very fine media (200 mesh and finer), the inlet baffle of the reclaimer may also need to be removed. Consult the factory before proceeding with this option.

5.6 Door Interlocks, Ref. Figure 7 Standard with optional electrical package

⚠ WARNING

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

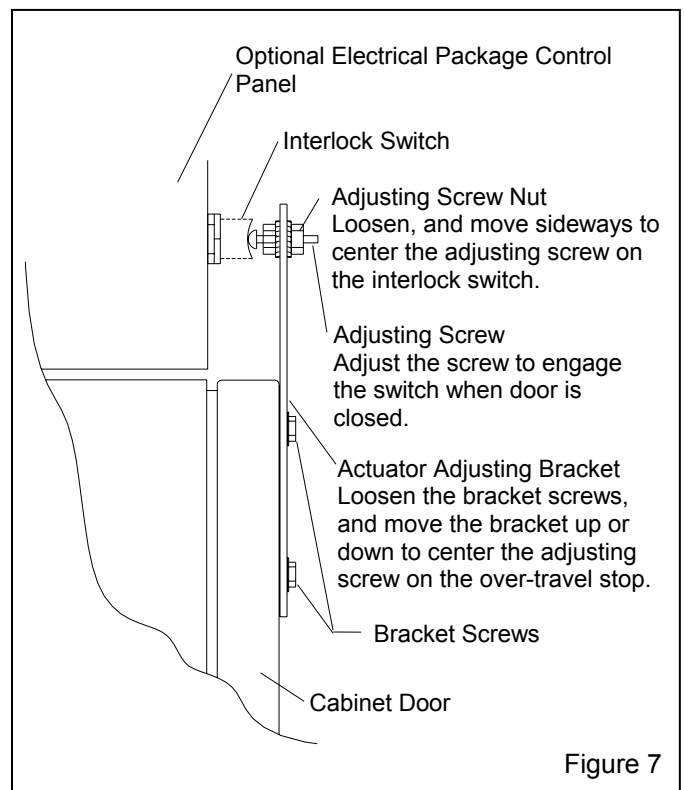


Figure 7

5.6.1 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.

5.6.2 Close cabinet door.

5.6.3 Loosen the actuator bracket screws and adjusting screw nut. Move the actuator adjusting bracket up or down, and the adjusting screw sideways, to center the adjusting screw on the switch button. Tighten the bracket screws.

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

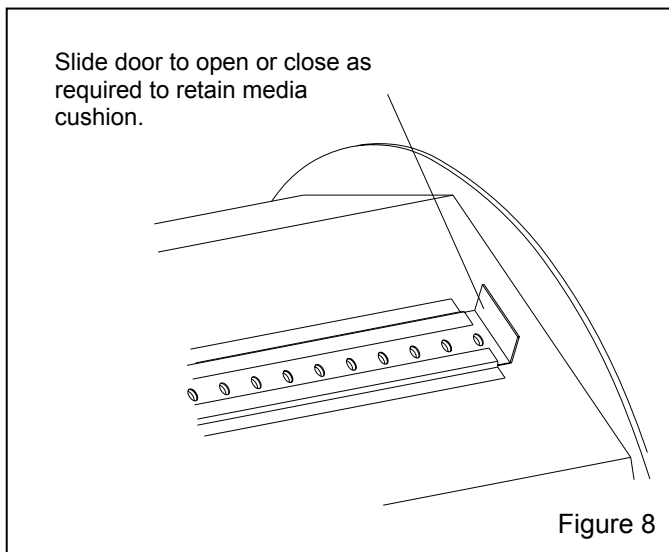
5.6.5 Test the operation with the door open only enough to disengage the interlock switch, and then again with the door closed. The interlock should stop the blasting when the door is opened, and permit blasting when the door is closed. NOTE: Negative pressure inside the cabinet may cause the door to flex inward. Tests should be performed with the exhauster on.

5.7 Tumble Barrel Slide Doors, Ref. Figure 8

5.7.1 The barrel must retain a certain amount of media to cushion parts as they tumble. The two slide doors control the amount of media contained in the barrel.

5.7.2 How far the slide doors are open depend on the parts and media size. Begin with the door set to allow a small amount of media to fall through the holes as the barrel turns.

5.7.3 After a short blast cycle, open the barrel loading door to see how much media is retained in the barrel and if the parts are nicked. Adjust the opening size accordingly.



5.8 Timer, Ref. Figure 4

5.8.1 Set the timer for the duration of the blast cycle. Blasting automatically stops when the timer times out. 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.

5.8.2 Timers on standard electrical packages require resetting after each cycle. The optional electrical package timer does not require resetting unless the blasting duration changes.

5.9 Speed Control, Ref. Figure 4. Available with optional electrical package only.

5.9.1 Set the speed control to rotate the barrel for optimum speed for processing the parts. Trial and error will determine the optimum speed setting. If multiple types of parts are processed using different speeds, make a note of the speed for future runs of similar parts.

6.0 PREVENTIVE MAINTENANCE

⚠ WARNING

Failure to wear approved respirators and eye protection when servicing dust-laden areas of the cabinet and dust collector, and when emptying the dust collector could result in serious eye irritation and lung disease or death. 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 material safety data sheet for the blast media.

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

6.1 Dry Filter Dust Collector

6.1.1 The dry filter uses tubular filters which collect dust on their inner surfaces. A shaker arm accessible from the outside of the collector is used to shake dust from the filters. Approximately every twenty minutes, turn off the exhauster and shake the filters vigorously.

CAUTION

Do not shake the filters when the exhauster is on. Doing so will accelerate wear on the filters around the shaker assembly, but not loosen the dust.

6.1.2 Empty the dust collector drawer regularly. Begin by checking the drawer several times daily and adjust frequency based on usage and breakdown rate of media. Dump the contents into a suitable disposal container.

CAUTION

Do not open the dust drawer door while the exhauster is on. The drawer chamber is under positive pressure when the exhauster is on. Opening the dust door while the exhauster is operating or the paddle wheel rotating, will allow dust to escape.

NOTE: Blast media is usually non-toxic, however, some materials removed by the process may be toxic. Check with proper authorities for disposal restrictions.

6.2 Reclaimer Debris Screen

6.2.1 The screen is accessible through the reclaimer door. With the exhauster off, remove the screen and empty it daily or when loading media. Empty the screen more often if part blasted causes excessive debris. Do not operate the machine without the screen in place.

6.3 Compressed Air Filter

6.3.1 The cabinet is equipped with a manual drain air filter. Drain the filter at least once a day, and more often if water is present. Moist air inhibits the flow of media. If moisture continues to be present, a dryer or after-cooler may be required.

6.4 Gear Reducer

WARNING

Lock out and tag out electrical power before continuing. Risk of severe injury to limbs and body is present when the drive guard is removed and the drive mechanism unexpectedly starts.

6.4.1 Inspect lubricant level monthly as follows.

6.4.2 Lock-out and tag-out electrical power and remove the drive guard.

6.4.3 Unless stated otherwise in the instructions supplied with the gear reducer, the lubricant should be

changed after the first 100 hours of operation. Thereafter, lubricant should be changed every 6 months.

6.4.4 Recommended Lubricant

6.4.4.1 Follow the instructions supplied with the gear reducer.

6.4.5 Changing Lubricant

6.4.5.1 Drain initial oil and flush the gear case with an approved non-flammable, non-toxic solvent and refill with an approved lubricant.

6.5 Bearing Lubrication

WARNING

Lock out and tag out electrical power before continuing. Risk of severe injury to limbs and body is present when the drive guard is removed and the drive mechanism unexpectedly starts.

6.5.1 Every 40 hours of operation lubricate the four flange bearings with a good quality general purpose bearing grease.

6.6 RP Dust Collector

Optional reverse-pulse dust collectors are covered by a separate manual.

7.0 SERVICE MAINTENANCE

WARNING

Lock out and tag out electrical power and the compressed air source before performing any maintenance on this machine. Failure to do so could result in severe injury due to the engagement of machinery or the release of trapped compressed air.

⚠ WARNING

Failure to wear approved respirators and eye protection when servicing dust-laden areas of the cabinet and dust collector, and when emptying the dust bag or collector could result in serious eye irritation, lung disease or death. Toxicity and health risk vary with type of media and dust generated by blasting. Identify all material being removed by blasting, and obtain a material safety data sheet for the blast media.

7.1 Nozzle

7.1.1 Replace the nozzle(s) when its diameter has increased by 1/16", or when suction diminishes noticeably. To inspect or change the nozzles, proceed as follows:

7.1.2 Remove the air supply hose from the gun rack by unscrewing the swivel fitting.

7.1.3 Release the two gun rack latches and remove the gun rack by sliding it out of the tube chamber.

7.1.4 Unscrew the holding nuts from the gun ends, and pull the nozzle from the guns. 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.

7.1.5 Reassemble the gun rack assembly and air hose.

7.2 Media Hose

7.2.1 To avoid unscheduled down-time, periodically inspect the media hose for thin spots, by pinching it every 6 to 12 inches.

7.2.2 Remove the gun rack per Section 7.1, to replace media hose.

7.3 Barrel Liners

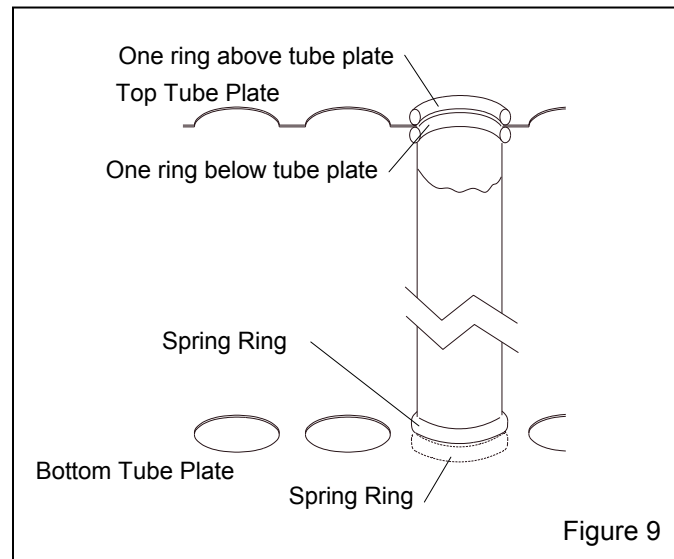
7.3.1 Periodically inspect the barrel liners for wear. Replace the liners as soon as the rubber is worn to the metal substrate.

7.4 Dry Filter Tube Replacement, Figure 9.

CAUTION

- Do not bend spring ends tight enough to cause ends to kink.
- Do not use a sharp instrument to force spring rings into the opening. This could damage the filter and seriously impair the function of the dust collector.
- Install one filter at a time. Check the seating of the top and bottom spring rings, and that tube is not twisted, before proceeding to the next.

7.4.1 Replace damaged filters immediately. Remove the old filters by pulling the spring rings off the bottom and top tube plates. Working from the back to the front, install one filter at a time. To install new filters, form the end of the spring ringed tubular filter into a shallow "c" shape, push the filter far enough into the hole of the top plate to allow one spring ring to snap into place above the tube plate and the other to snap into place below it. See the illustration in Figure 9.



7.4.2 The tubular filter is held firmly by spring rings above and below the perimeter of the hole in the top and bottom tube plate. The filters fit tight to prevent dust leakage. Force may be required by the installer. Check for proper seating at both ends, and remove any twist in the tube before proceeding to the next filter.

7.5 Reclaimer Wear Plate Replacement

7.5.1 Remove the reclaimer inlet adaptor and old wear plate. The wear plate is held in place by screws attached from the outside of the reclaimer.

7.5.2 Angle the new wear plate into reclaimer inlet until it is in position with the straight end at the reclaimer inlet. Using a board or similar object as leverage, pry the wear plate against the inner wall of the reclaimer and install sheet metal screws to hold in place. Caulk any gaps or voids around the wear plate to prevent rapid wear in those areas.

7.6 RP Dust Collector

Optional reverse-pulse dust collectors are covered by a separate manual.

8.0 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.**
- **Never override the door interlock system.**

8.1 Dust Leaking From The Cabinet Enclosure

8.1.1 Dirty tube filters or filter cartridge. Shake tube filters, and empty dust drawer regularly. Refer to the RP Dust Collector Manual for pulse pressure and sequence.

8.1.2 Motor rotating backwards. The motor should rotate as indicated by the arrow on the housing. If it does not rotate in the proper direction, LOCK-OUT AND TAG-OUT POWER and switch the motor leads as shown on the motor plate. See Section 2.6.

8.1.3 Damaged gaskets. Inspect and replace damaged gaskets.

8.1.4 Outlet damper closed too far restricting air movement in cabinet. Adjust static pressure per Section 5.4.

8.1.5 Hole worn in flex hose between cabinet hopper and reclaimer inlet (if RP collector is used also check hose between the reclaimer outlet and dust collector inlet). Replace hose and route it with as few bends as possible to prevent wear.

8.1.6 Reclaimer door open.

8.1.7 Obstruction in flex hose between the cabinet hopper and reclaimer inlet.

8.1.8 Paddle wheel worn. Check wheel for wear.

8.2 Abnormally High Media Consumption

8.2.1 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.

8.2.2 Dust collector damper open too far. Adjust static pressure per Section 5.4.

8.2.3 Media may be too fine or worn-out.

8.2.4 Using friable media that rapidly breaks down.

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

8.2.6 Hole worn in reclaimer, or leak in reclaimer seams. Check entire reclaimer for negative-pressure leaks.

8.2.7 If using very fine media (200 mesh and finer), the inlet baffle of the reclaimer may need to be removed. Consult the factory before proceeding with this option.

8.2.8 Optional externally adjustable vortex cylinder out of adjustment. See Section 5.5.

8.3 Reduction In Blast Cleaning Rate

8.3.1 Low media level reducing media flow. Check and fill if low.

8.3.2 Incorrect metering valve adjustment. Adjust per Section 5.3.

8.3.3 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.

8.3.4 Blockage in media line or gun. Blockage may occur as a result of a missing debris screen, or incorrect metering valve adjustment permitting heavy media flow. See Section 5.3.

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

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

8.3.7 Moist media. Frequent bridges or blockage in the area of the metering valve can be caused by moisture. See Section 8.5.

8.4 Plugged Nozzle

8.4.1 A damaged or missing reclaimer screen will allow large particles to pass and block the nozzle. Replace or re-install as necessary.

8.4.2 Media mixture too rich. Adjust media/air mixture per Section 5.3.

8.5 Media Bridging

8.5.1 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, from moisture in the compressed air line, or from absorption.

8.5.2 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.

8.5.3 Moist compressed air may be due to a faulty compressor that overheats, or pumps oil or moisture into the air line, too long 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.

8.5.4 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.

8.5.5 A vibrator attached to the reclaimer cone or media metering valve may help prevent bridging of fine-mesh media.

8.6 No Media or Air Comes Out The Nozzle During Blast Cycle.

8.6.1 Door interlocks not engaging. Check adjustment per Section 5.6.

8.6.2 Pressure regulator may be turned down or off. Check pressure on pilot regulator.

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

8.7 Blockage In Media Hose

8.7.1 Media obstructions. Usually caused when the media mixture is too rich. Adjust media/air mixture per Section 5.3.

8.7.2 Wet or damp media. See Section 8.5.

8.8 Media Surge

8.8.1 Heavy media flow. Adjust per Section 5.3.

8.9 Poor Suction In Media Hose

8.9.1 Inadequate air supply. Compare air supply with cfm table in Figures 3. Compare air supply size with sizes recommended in Section 2.4.

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

8.9.3 Blockage in media hose or nozzle. See Section 8.4.

8.10 Blow-Back Through Media Hose

8.10.1 Blockage in nozzle. Remove the nozzle and check blockage.

8.11 Static Shocks

8.11.1 Cabinet and/or operator not grounded. Abrasive blasting generates static electricity. The cabinet must be grounded to prevent static buildup. See Section 2.5.

8.12 Dust Leaking From Dust Collector

Refer to RP Dust Collector Manual for service of reverse-pulse dust collectors.

8.12.1 Check for damaged or loose filters.

8.12.2 Check for a faulty seal on the dust drawer.

8.12.3 Check that upper and lower tube sheets are sealed on both sides, front, and rear.

9.0 ACCESSORIES AND REPLACEMENT PARTS

9.1 Optional Accessories

Lock pins (pkg. of 25) for twist-on hose couplings .	11203
Manometer kit	12528
Nozzles	
boron carbide, No. 5	11935
tungsten carbide, No. 5	13118
Barrel divider kit, field installed	22332

9.2 Electrical Components

Refer to the Electrical Schematic packed in the control panel for electrical replacement parts.

9.3 Cabinet and Drum Assembly, Figure 10

Item	Description	Stock No.
1.	Gasket, door, adhesive backed, 162, 24 ft. required	00187
	164, 26 ft. required	00187
	166, 30 ft. required	00187
2.	Parts tray	
	for 162	14422
	for 164	14417
	for 166	14423

3.	Latch, door	11875
4.	Barrel assembly w/inserts, less door assembly	
	for 162	13010
	for 164	12228
	for 166	12229
5.	Door assembly, tumble barrel	
	for 162	12246
	for 164	12247
	for 166	12248
6.	Clamp, barrel door	11580
7.	Slide door kit	
	for 162	20593
	for 164	20594
	for 166	20595
*8.	Insert, door liner	
	for 162	11681
	for 164	11680
	for 166	11682
*9.	Insert, 3-panel liner	
	for 162	11857
	for 164	11860
	for 166	11861
*10.	Insert, 2-panel w/ slide holes, 2 required	
	for 162	11858
	for 164	11859
	for 166	11862

* Items 8, 9 & 10 are made from rubber covered metal

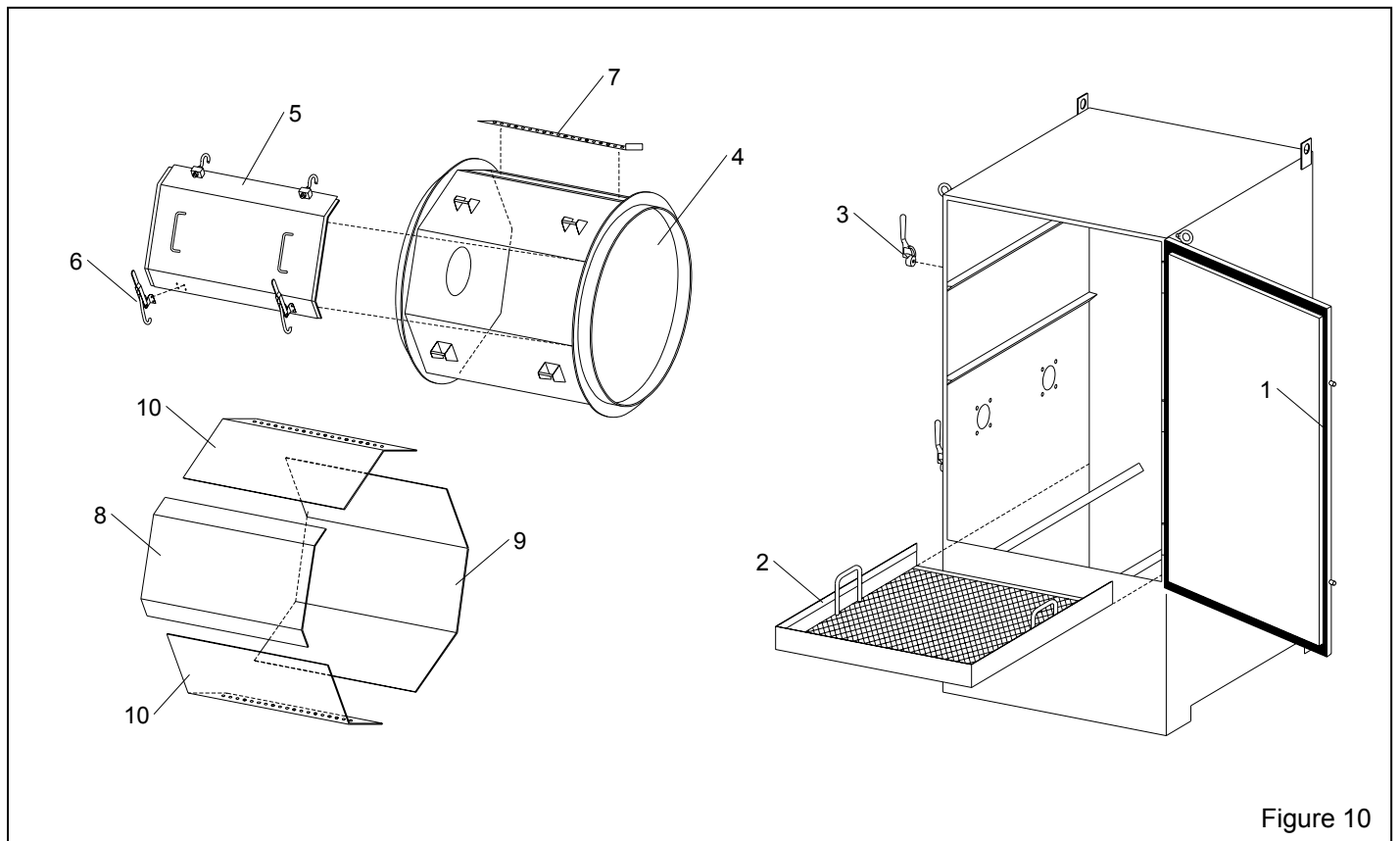


Figure 10

9.4 Gun and Rack Assembly, Figure 11

Item	Description	Stock No.
1.	Nut, nozzle holding	11914
2.	Body, gun	12267
3.	Air jet No. 4, 1/8" orifice (use with limited air)	11951
	No. 5, 5/32" orifice (standard)	11952
4.	Nozzle Ceramic No. 5, (standard)	11930
	boron carbide, No. 5	11935
	tungsten carbide, No. 5	13118
5.	Washer	04396
6.	Bushing, 3/8" x 1/4"	12818
7.	Nipple, 1/4" x 1" toe	11912
8.	Hose, 1/2" media, 10 ft. reqd. per gun	12471
9.	Chamber, gun rack for 162	13861
	for 164	13062
	for 166	14420
10.	Gasket, gun rack chamber	23479
11.	Air manifold, gun rack for 162	13862
	for 164	14419
	for 166	14421
12.	Gasket, air manifold	11744
13.	Adaptor, 1" male NPT x 1" male flare	11720
14.	Latch assembly, spring	12263

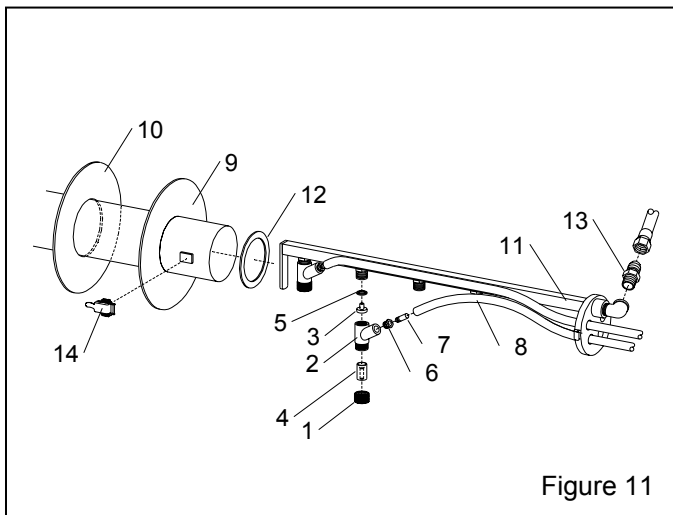


Figure 11

9.5 Drive Mechanism, Figure 12

Item	Description	Stock No.
1.	Wheel	12217
2.	Bearing, flange	11519
3.	Chain, #40 roller, 6.58 ft. required	12430
4.	Shaft, wheel for 162	12075
	for 164	12076
	for 166	12077
5.	Sprocket, 15 tooth, used on gear drive	12101
6.	Gear reducer	12026
7.	Sprocket, 24 tooth (for variable speed)	13090
8.	Bushing, constant speed sprocket	11556
9.	Sprocket, 60 tooth (for constant speed)	12102
10.	Motor, 3/4 HP, variable speed DC	11903
11.	Motor, constant speed 1/2-HP, 3-PH, for 162.....	12311
	3/4-HP, 3-PH, for 164 and 166	13373

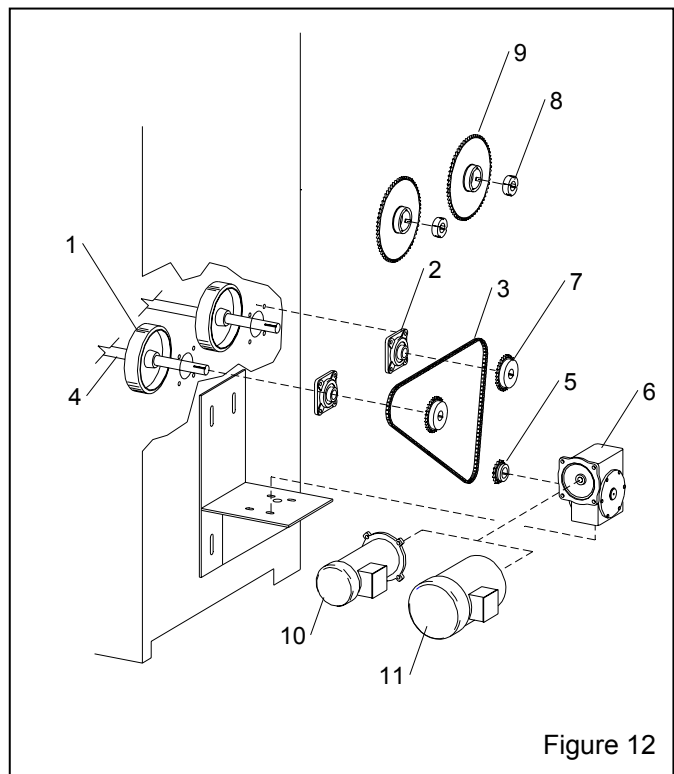


Figure 12

9.6 Media Metering Assemblies, Figure 13

Item	Description	Stock No.
1.	Metering valve assembly, Lexan	12420
2.	Stem, metering adjusting	23097
3.	Screw, adjusting	23098
4.	Nut, adjusting stem lock	23099
5.	Plug, 1" plastic	12011
6.	Nipple, 1" x close	01701
7.	Manifold, multiple metering valve	12322
8.	Tee, 1" pipe.....	01789
9.	Body, Lexan metering valve	11534

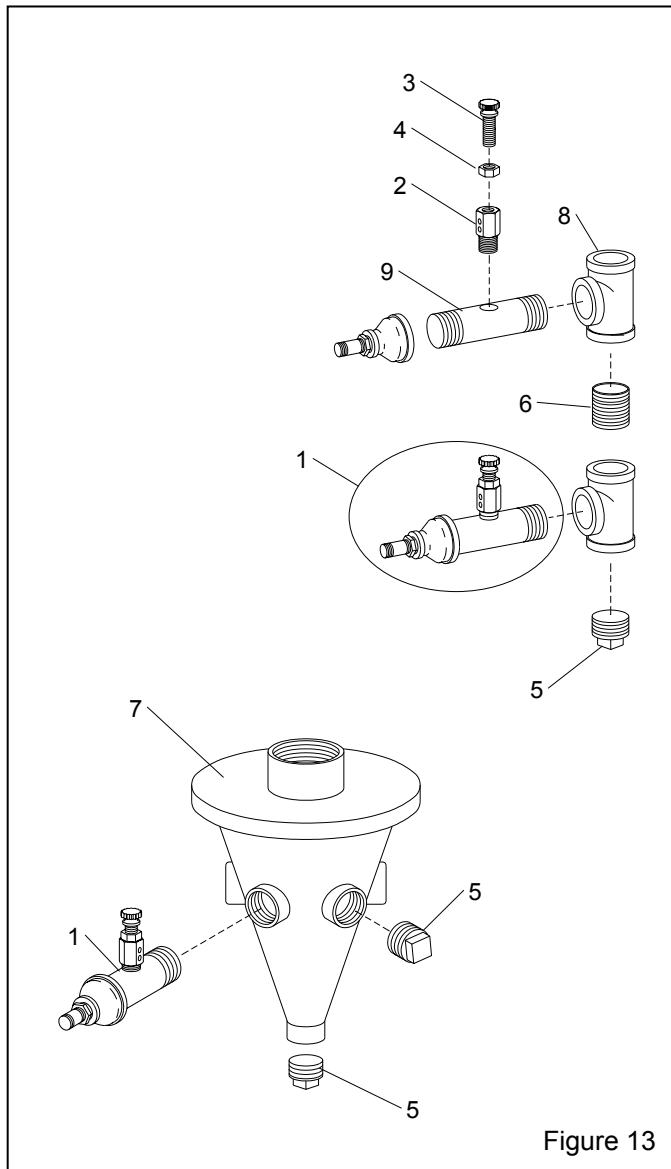


Figure 13

9.7 Plumbing Assembly, Figure 14

Item	Description	Stock No.
1.	Filter, air with auto drain 1" for 162 and 164	22425
	1-1/2" for 166	22364
2.	Regulator, 1/4" pilot w/gauge	12050
3.	Gauge, 1/8" cbm, replacement	01908
4.	Bushing, 1/4" x 1/8" brass	02010
5.	Adaptor, elbow, 1/4" male NPT x 1/4 tube ..	11738
6.	Tubing, 1/4", 1 ft. required	12480
7.	Solenoid, 1/4", 3-way	12199
8.	Regulator, pilot operated with gauge 1", for 162 and 164	12052
	1-1/2", for 166	12051
9.	Hose assembly, 1" x 32" coupled	22864
10.	Adaptor, 1" male NPT x 1" male flare	11720
11.	U-bolt for 162 and 164, 1-3/4"	11530
	for 166, 2"	10205
12.	Nipple, 1/4" brass hex	02808

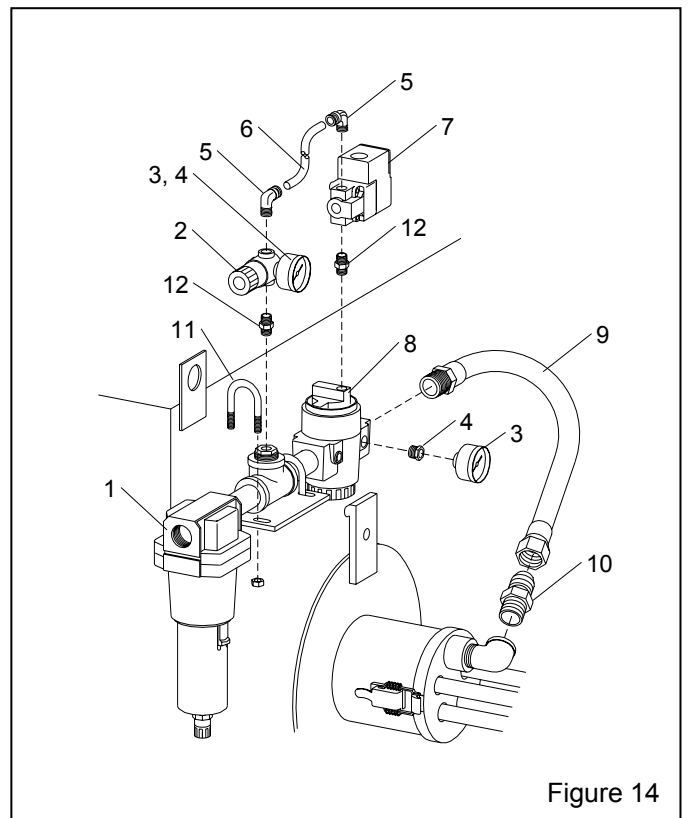


Figure 14

9.8 Reclaimer, Figure 15

Item	Description	Stock No.
(-)	Reclaimer assembly, 300 cfm, complete, w/ exhauster	12402
	less exhauster assembly	12403
(-)	Reclaimer assembly, 600 cfm w/ 2" cone outlet less exhauster assembly	20265
	complete, w/ exhauster	20266
(-)	Reclaimer assembly, 900 cfm complete, w/ exhauster	12398
	less exhauster assembly	12399
1.	Motor, exhauster	
	300 cfm, 1/2 HP, 115/230, 1-Ph	12308
	300 cfm, 1 HP, 230/460, 3-Ph	12310
	600 cfm, 1 HP, 115/230, 1-Ph	12314
	600 cfm, 1 HP, 230/460, 3-Ph	12310
	900 cfm, 2 HP, 230/460, 3-Ph	12309
2.	Plate, motor mount	
	300 cfm	12003
	600 cfm	12004
	900 cfm	12005
3.	Housing, exhauster	
	300 cfm	12273
	600 cfm	12272
	900 cfm	12271
4.	Gasket, 5/16" x 1" adhesive backed, 4 ft. required for each location	00187
5.	Paddle wheel	
	300 cfm	12333
	600 cfm	12334
	900 cfm	12335

6.	Inlet pipe adaptor	
	300 cfm, 4"	12365
	600 cfm, 5"	12361
	900 cfm, 6"	12363
7.	Gasket, inlet adaptor	
	300 cfm	11746
	600 cfm	11779
	900 cfm	11759
8.	Wear plate	
	300 cfm	14060
	600 cfm	13011
	900 cfm	14055
9.	Clamp, hose	
	4-1/2", for 300 cfm	11577
	5-1/2", for 600 cfm	11578
	6-1/2", for 900 cfm	11576
10.	Screen assembly	21265
11.	Gasket, door	11745
12.	Hose, heavy lined flex, 15 ft lengths only	
	4" ID for 300 cfm	12473
	5" ID for 600 cfm	12465
	6" ID for 900 cfm	12457
13.	Spring latch assembly	12263
14.	Vortex cylinder assembly, adjustable, for exhauster mounted reclaimer (optional)	
	300 cfm	19059
	600 cfm	19062
	900 cfm	23047
15.	Vortex cylinder assembly, adjustable, for pull-through reclaimer	
	300 cfm	19077
	600 cfm	19080
	900 cfm	23046

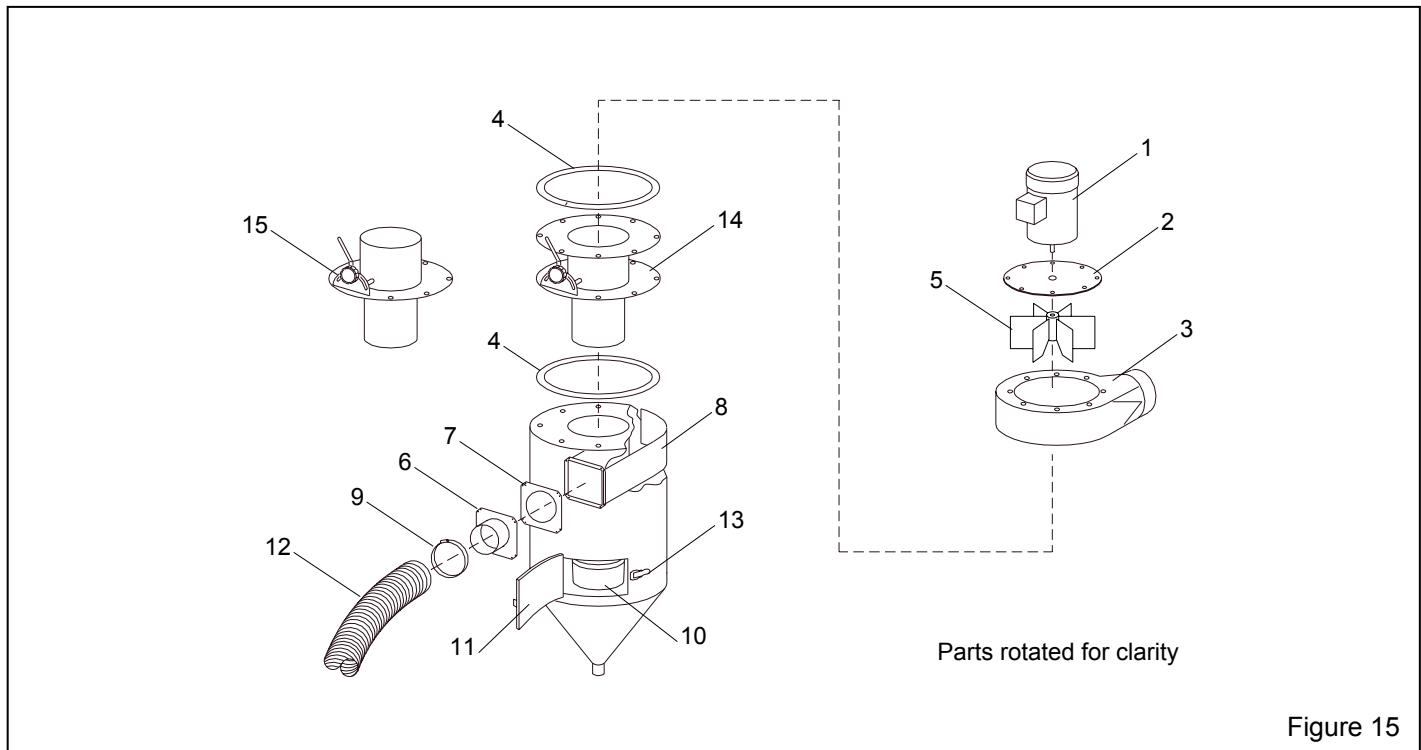


Figure 15

**9.9 Dry Filter Dust Collector and Dust Bags,
Figure 16**

Item	Description	Stock No.
(-)	Dry filter, complete	
	300 cfm	12699
	600 cfm	12700
	900 cfm	12701
1.	Hose, flex, specify length, 5 feet is standard.	
	5" for 300 cfm	12449
	6" for 600 cfm	12452
	7" for 900 cfm	12448
2.	Inlet adaptor w/ damper	
	5" for 300 cfm	21232
	6" for 600 cfm	14272
	7" for 900 cfm	14273
3.	Gasket, inlet adaptor	
	for 300 cfm	21233
	for 600 cfm	11762
	for 900 cfm	11763
4.	Gasket, dust drawer	11771

5.	Clamp, hose	
	5-1/2", for 300	11578
	6-1/2", for 600	00750
	8-1/2", for 900	11576
6.	Spring latch assembly	12263
7.	Drawer, dust	
	for 300 cfm	14274
	for 600 cfm	14275
	for 900 cfm	14276
8.	Plate, inlet cover	
	for 600 cfm	14277
	for 900 cfm	14278
9.	Tubular filter, each	11503
	300 cfm requires 15	
	600 cfm requires 25	
	900 cfm requires 40	
10.	Shaker, tube filter	
	300 cfm	12413
	600 cfm	12414
	900 cfm	12415
11.	Handle, shaker	12899

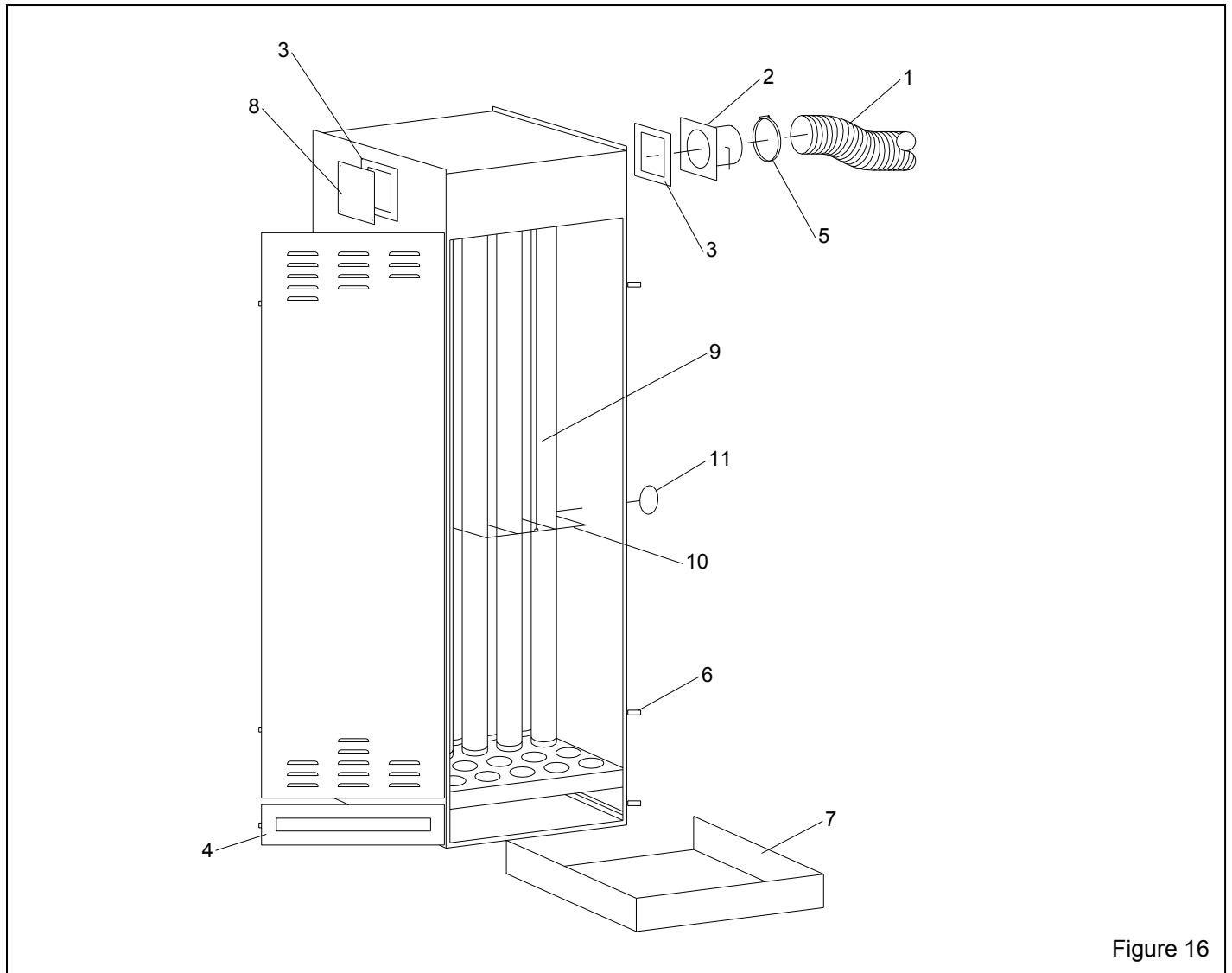


Figure 16