

**POWER GUN
SUCTION ABRASIVE BLAST TOOL
O. M. 24189**

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 **WARNING**

Do not proceed with these instructions until you have READ the orange cover of this MANUAL and YOU UNDERSTAND its contents. *

These WARNINGS are included for the health and safety of the operator and those in the immediate vicinity.

***If you are using a Clemco Distributor Maintenance and Parts Guide, refer to the orange warnings insert preceding the Index before continuing with the enclosed instructions.**

Electronic files include a Preface containing the same important information as the orange cover.

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⚠ WARNING

- Read and follow ALL instructions before using this equipment.
- Failure to comply with ALL instructions can result in serious injury or death.
- In the event that the user, or any assistants of the user of this equipment cannot read or cannot completely understand the warnings and information contained in these instructions, the employer of the user and his assistants must thoroughly educate and train them on the proper operation and safety procedures of this equipment.

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 or 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.

Abrasive Blast Equipment is only a component of the range of equipment used in an abrasive blasting job. Other products may include an air compressor, abrasive, scaffolding, hydraulic work platforms or booms, paint spray equipment, dehumidification equipment, air filters and receivers, lights, ventilation equipment, parts handling equipment, specialized respirators, or equipment that while offered by Clemco may have been supplied by others. Each manufacturer and supplier of the other products used in the abrasive blasting job must be contacted for information, training, instruction and warnings with regard to the proper and safe use of their equipment in the particular application for which the equipment is being used. The information provided by Clemco is intended to provide instruction only on Clemco products. All operators must be trained in the proper, safe, use of this equipment. It is the responsibility of the users to familiarize themselves with, and comply with, all appropriate laws, regulations, and safe practices that apply to the use of these products. Consult with your employer about training programs and materials that are available.

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.

GENERAL INSTRUCTIONS

Described herein are some, BUT NOT ALL, of the major requirements for safe and productive use of blast machines, remote control systems, operator respirator assemblies, and related accessories. Completely read ALL instruction manuals prior to using equipment.

The user's work environment may include certain HAZARDS related to the abrasive blasting operation. Proper protection for the blaster, as well as anyone else that may be EXPOSED to the hazards generated by the blasting process, is the responsibility of the user and/or the employer. Operators MUST consult with their employer about what hazards may be present in the work environment including, but not limited to, exposure to dust that may contain TOXIC MATERIALS due to the presence of silica, cyanide, arsenic or other toxins in the abrasive, or materials present in the surface to be blasted such as lead or heavy metals in coatings. The environment may also include fumes that may be present from adjacent coatings application, contaminated water, engine exhaust, chemicals, and asbestos. The work area may include PHYSICAL HAZARDS such as an uneven work surface, poor visibility, excess noise, and electrical hazards. The operator MUST consult with his employer on the identification of potential hazards, and the appropriate measures that MUST be taken to protect the blaster and others that might be exposed to these hazards.

ALL machines, components and accessories MUST be installed, tested, operated and maintained only by trained, knowledgeable, experienced users.

DO NOT modify or substitute any Clemco parts with other types or brands of equipment. Unauthorized modification and parts substitution on supplied air respirators is a violation of OSHA regulations and voids the NIOSH approval.

OPERATIONAL INSTRUCTIONS

OPERATOR SAFETY EQUIPMENT

⚠ WARNING


- Blast operators and others working in the vicinity of abrasive blasting must always wear properly-maintained, NIOSH-approved, respiratory protection appropriate for the job site hazards.
- DO NOT USE abrasives containing more than one percent crystalline (free) silica. Ref. NIOSH Alert #92-102
- Inhalation of toxic dust (crystalline silica, asbestos, lead paint and other toxins) can lead to serious or fatal disease (silicosis, asbestosis, lead or other poisoning).

- ALWAYS wear NIOSH-approved supplied-air respirators as required by OSHA, in the presence of any dust including, but not limited to, handling or loading abrasive; blasting or working in the vicinity of blast jobs; and cleanup of expended abrasive. Prior to removing respirator, an air monitoring

instrument should be used to determine when surrounding atmosphere is clear of dust and safe to breathe.

- NIOSH-approved, supplied-air respirators are to be worn ONLY in atmospheres:
 - NOT IMMEDIATELY dangerous to life or health and,
 - from which a user can escape WITHOUT using the respirator.
- Clemco supplied-air respirators **DO NOT REMOVE OR PROTECT AGAINST CARBON MONOXIDE (CO) OR ANY OTHER TOXIC GAS.** Carbon monoxide and toxic gas removal and/or monitoring device must be used in conjunction with respirator to insure safe breathing air.
- Air supplied to respirator **MUST BE AT LEAST GRADE D QUALITY** as described in Compressed Gas Association Commodity Specification G-7.1, and as specified by OSHA Regulation 1910.139 (d).
- ALWAYS locate compressors to prevent contaminated air (such as CO from engine exhaust) from entering the air intake system. A suitable in-line air purifying sorbent bed and filter or CO Monitor should be installed to assure breathing air quality.
- ALWAYS use a NIOSH-approved breathing air hose to connect an appropriate air filter to the respirator. Use of a non-approved air hose can subject the operator to illness caused by the release of chemical agents used in the manufacture of non-approved breathing air hose.
- ALWAYS check to make sure air filter and respirator system hoses are NOT CONNECTED to in-plant lines that contain nitrogen, acetylene or any other non-breathable gas. NEVER use oxygen with air line respirators. NEVER modify air line connections to accommodate air filter/respirator breathing hose WITHOUT FIRST testing content of the air line. **FAILURE TO TEST THE AIR LINE MAY RESULT IN DEATH TO THE RESPIRATOR USER.**
- Respirator lenses are designed to protect against rebounding abrasive. They do not protect against flying objects, glare, liquids, radiation or high speed heavy materials. Substitute lenses from sources other than the original respirator manufacturer will void NIOSH-approval of this respirator.

BLAST MACHINES AND REMOTE CONTROLS

 WARNING
<ul style="list-style-type: none"> • ALWAYS equip abrasive blast machines with remote controls. • Abrasive blast machine operators must wear NIOSH-approved supplied-air respirators (ref: OSHA regulations 1910.94, 1910.132, 1910.139 and 1910.244).

- NEVER modify OR substitute remote control parts. Parts from different manufacturers are NOT compatible with Clemco

equipment. If controls are altered, involuntary activation, which may cause serious injury, can occur.

- Inspect the air control orifice DAILY for cleanliness. NEVER use welding hose in place of twinline control hose. The internal diameter and rubber composition are UNSAFE for remote control use.
- UNLESS OTHERWISE SPECIFIED, maximum working pressure of blast machines and related components MUST NOT exceed National Board approved 125 psig (8.5 BAR).
- NEVER weld on blast machine. Welding may affect dimensional integrity of steel wall and WILL VOID National Board approval.
- Point nozzle ONLY at structure being blasted. High velocity abrasive particles WILL inflict serious injury. Keep unprotected workers OUT of blast area.
- NEVER attempt to manually move blast machine when it contains abrasive. EMPTY machines, up to 6 cu. ft.(270kg) capacity, are designed to be moved:
 - on flat, smooth surfaces by AT LEAST two people;
 - with the Clemco "Mule"; or
 - with other specially designed machine moving devices.
- Larger empty blast machines or ANY blast machine containing abrasive MUST be transported by mechanical lifting equipment.

AIR HOSE, BLAST HOSE, COUPLINGS, AND NOZZLE HOLDERS

- Air hose, air hose fittings and connectors at compressors and blast machines MUST be FOUR times the size of the nozzle orifice. Air hose lengths MUST be kept as short as possible AND in a straight line. Inspect DAILY and repair leakage IMMEDIATELY.
- Blast hose inside diameter MUST be THREE to FOUR times the size of the nozzle orifice. AVOID sharp bends that wear out hose rapidly. Use SHORTEST hose lengths possible to reduce pressure loss. Check blast hose DAILY for soft spots. Repair or replace IMMEDIATELY.
- ALWAYS cut loose hose ends square when installing hose couplings and nozzle holders to allow uniform fit of hose to coupling shoulder. NEVER install couplings or nozzle holders that DO NOT provide a TIGHT fit on hose. ALWAYS use manufacturers recommended coupling screws.
- Replace coupling gaskets FREQUENTLY to prevent leakage. Abrasive leakage can result in dangerous coupling failure. ALL gaskets MUST be checked SEVERAL times during a working day for wear, distortion and softness.
- Install safety pins at EVERY coupling connection to prevent accidental disengagement during hose movement.
- ALWAYS attach safety cables at ALL air hose AND blast hose coupling connections. Cables relieve tension on hose and control whipping action in the event of a coupling blow-out.

MAINTENANCE

- ALWAYS shut off compressor and depressurize blast machine BEFORE doing ANY maintenance.
- Always check and clean ALL filters, screens and alarm systems when doing any maintenance.
- ALWAYS cage springs BEFORE disassembling valves IF spring-loaded abrasive control valves are used.
- ALWAYS completely follow owner's manual instructions and maintain equipment at RECOMMENDED intervals.

ADDITIONAL ASSISTANCE

- Training and Educational Programs. Clemco Industries Corp. offers a booklet, Blast-Off 2, developed to educate personnel on abrasive blast equipment function and surface preparation techniques. Readers will learn safe and productive use of machines, components and various accessories, including selection of abrasive materials for specific surface profiles and degrees of cleanliness.
- The Society for Protective Coatings (SSPC) offers a video training series on protective coatings including one entitled "Surface Preparation." For loan or purchase information, contact SSPC at the address shown below.

TECHNICAL DATA AND RESEARCH COMMITTEES

- The following associations offer information, materials and videos relating to abrasive blasting and safe operating practices.

The Society for Protective Coatings (SSPC)
 40 24th Street, Pittsburgh PA 15222-4643
 Phone: (412) 281-2331 • FAX (412) 281-9992
 Email: research@sspc.org • Website: www.sspc.org

National Association of Corrosion Engineers (NACE)
 1440 South Creek Drive, Houston TX 77084
 Phone: (281) 228-6200 • FAX (281) 228-6300
 Email: msd@mail.nace.org • Website: www.nace.org

American Society for Testing and Materials (ASTM)
 100 Barr Harbor Dr., West Conshohocken, PA 19428
 Phone (610) 832-9500 • FAX (610) 832-9555
 Email: service@astm.org • Website: www.astm.org

NOTICE

This equipment is not intended to be used in an area that might be considered a hazardous location as described in the National Electric Code NFPA 70 1996, article 500.


WARRANTY

The following is in lieu of all warranties express, implied or statutory and in no event shall seller or its agents, successors, nominees or assignees, or either, be liable for special or consequential damage arising out of a breach of warranty. This warranty does not apply to any damage or defect resulting from negligent or improper assembly or use of any item by the buyer or its agent or from alteration or attempted repair by any person other than an authorized agent of seller. All used, repaired, modified or altered items are purchased "as is" and with all faults. In no event shall seller be liable for consequential or incidental damages. The sole and exclusive remedy of buyer for breach of warranty by seller shall be repair or replacement of defective parts or, at seller's option, refund

- of the purchase price, as set forth below:
1. Seller makes no warranty with respect to products used other than in accordance hereunder.
 2. On products seller manufactures, seller warrants that all products are to be free from defects in workmanship and materials for a period of one year from date of shipment to buyer, but no warranty is made that the products are fit for a particular purpose.
 3. On products which seller buys and resells pursuant to this order, seller warrants that the products shall carry the then standard warranties of the manufacturers thereof, a copy of which shall be made available to customer upon request.
 4. The use of any sample or model in connection with this order is for illustrative purposes only and is not to be construed as a warranty that the product will conform to the sample or model.
 5. Seller makes no warranty that the products are delivered free of the rightful claim of any third party by way of patent infringement or the like.
 6. This warranty is conditioned upon seller's receipt within ten (10) days after a buyer's discovery of a defect, of a written notice stating in what specific material respects the product failed to meet this warranty. If such notice is timely given, seller will, at its option, either modify the product or part to correct the defect, replace the product or part with complying products or parts, or refund the amount paid for the defective product, any one of which will constitute the sole liability of seller and a full settlement of all claims. No allowance will be made for alterations or repairs made by other than those authorized by seller without the prior written consent of seller. Buyer shall afford seller prompt and reasonable opportunity to inspect the products for which any claim is made as above stated.

Except as expressly set forth above, all warranties, express, implied or statutory, including implied warranty of merchantability, are hereby disclaimed.

DAILY SET-UP CHECK LIST

 WARNING
<ul style="list-style-type: none"> • ALL piping, fittings and hoses MUST be checked DAILY for tightness and leakage. • ALL equipment and components MUST be thoroughly checked for wear. • ALL worn or suspicious parts MUST be replaced. • ALL blast operators MUST be properly trained to operate equipment. • ALL blast operators MUST be properly outfitted with abrasive resistant clothing, safety shoes, leather gloves and ear protection. • BEFORE blasting ALWAYS use the following check list.

1. PROPERLY MAINTAINED AIR COMPRESSOR sized to provide sufficient volume (cfm) for nozzle and other tools PLUS a 50% reserve to allow for nozzle wear. Use large compressor outlet and large air hose (4 times the nozzle orifice size). FOLLOW MANUFACTURERS MAINTENANCE INSTRUCTIONS.

2. BREATHING AIR COMPRESSOR (oil-less air pump) capable of providing Grade D Quality air located in a dust free, contaminant free area. If oil-lubricated air compressor is used to supply respirator, it should have high temperature monitor and CO monitor or both. If CO monitor is not used, air **MUST** be tested FREQUENTLY to ensure proper air quality.

3. Clean, properly maintained NIOSH-APPROVED SUPPLIED-AIR RESPIRATOR. ALL components should ALWAYS be present. NEVER operate without inner lens in place. Thoroughly inspect ALL components DAILY for cleanliness and wear. ANY substitution of parts voids NIOSH approval i.e. cape, lenses, breathing hose, breathing air supply hose, air control valve, cool air or climate control devices.

4. OSHA required BREATHING AIR FILTER for removal of moisture and particulate matter from breathing air supply. THIS DEVICE DOES NOT REMOVE OR DETECT CARBON MONOXIDE (CO). ALWAYS USE CO MONITOR ALARM.

5. ASME CODED BLAST MACHINE sized to hold 1/2 hour abrasive supply. ALWAYS ground machine to eliminate static electricity hazard. Examine pop up valve for alignment. Blast machine MUST be fitted with a screen to keep out foreign objects and a cover to prevent entry of moisture overnight.

6. AIR LINE FILTER installed AS CLOSE AS POSSIBLE to machine inlet. Sized to match inlet piping or larger air supply line. Clean filter DAILY. Drain OFTEN.

7. REMOTE CONTROLS MUST be in PERFECT operating condition. ONLY use APPROVED spare parts, including twin-line hose. DAILY: test system operation and check button bumper and spring action of lever and lever lock. DO NOT USE WELDING HOSE.

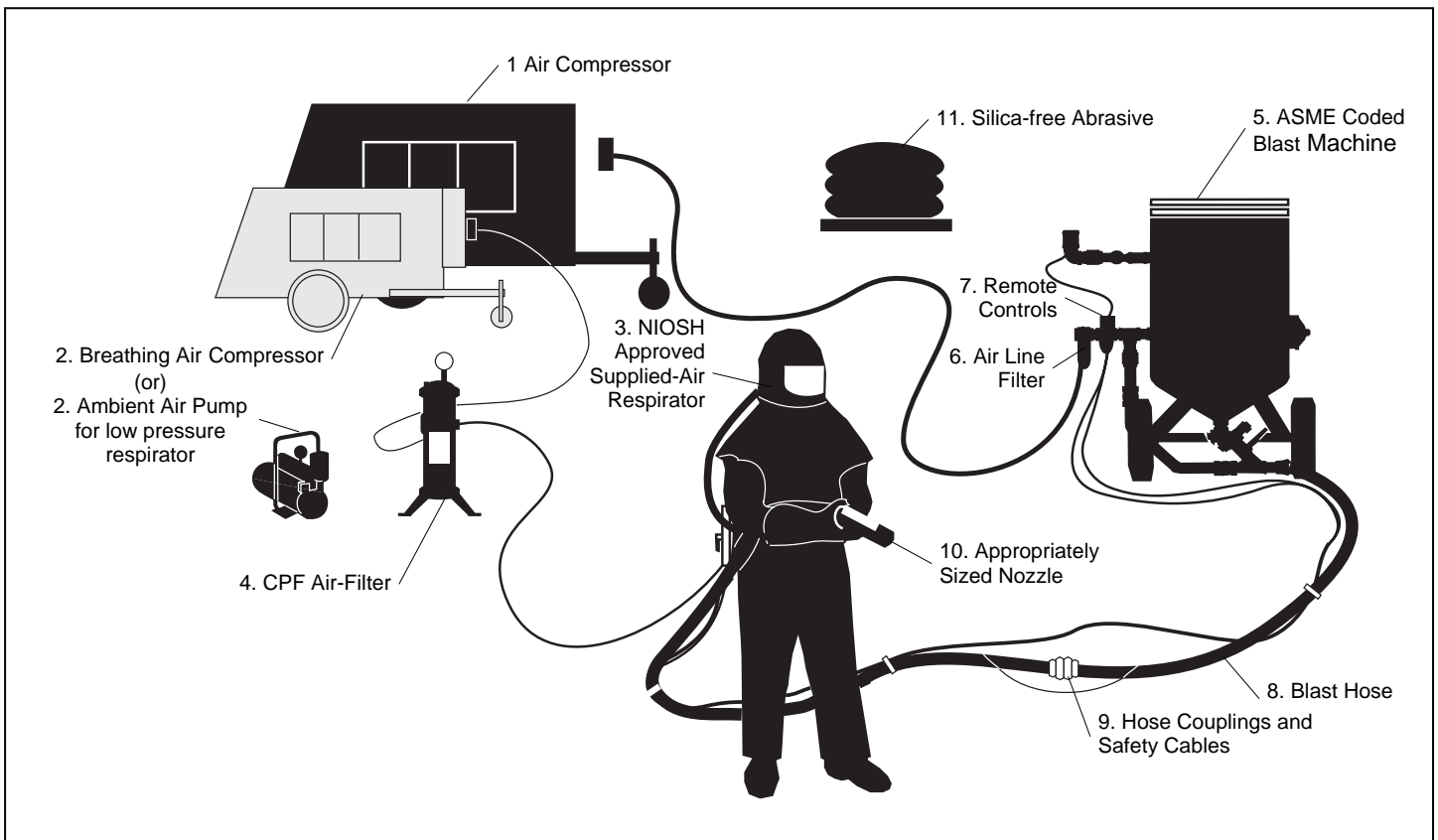
8. BLAST HOSE with ID 3 to 4 times the nozzle orifice. Lines MUST be run AS STRAIGHT AS POSSIBLE from machine to work area with NO sharp bends. Check DAILY for internal wear and external damage.

9. HOSE COUPLINGS, NOZZLE HOLDERS fitted SNUGLY to hose end and installed using PROPER coupling screws. Coupling lugs MUST be snapped FIRMLY into locking position. Gasket MUST form positive seal with safety pins inserted through pin holes. Check gaskets and replace if ANY sign of wear, softness or distortion. ALWAYS install safety cables at every connection to prevent disengagement. Check nozzle holder for worn threads. NEVER MIX DIFFERENT BRANDS OF COMPONENTS. Check each of these components DAILY.

10. Inspect NOZZLE and GASKET DAILY for wear. Replace nozzle when 1/16" larger than original size or if liner appears cracked. Check nozzle threads for wear.

11. Use abrasive that is properly sized and free of harmful substances; such as, free silica, cyanide, arsenic or lead. Check material data sheet for presence of toxic or harmful substances.

12. Test surface to be blasted for toxic substances. Take appropriate, and NIOSH required, protective measures for operator and bystanders which pertain to substances found on the surface to be blasted.



1.0 INTRODUCTION

1.1 Scope of manual

1.1.1 This manual covers the installation, operation, maintenance, and replacement parts of the Clemco Power Gun.

1.1.2 The operator and all personnel in and around the blasting area must be well informed of the hazards associated with abrasive blasting. Before using this machine, all personnel involved with the blast operation must read this entire manual and all accessory manuals, including the orange cover.

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 The Power Gun is a suction-type abrasive blasting tool, available with or without the cart and hopper. The Power Gun is ideally suited for light-duty, small, and touchup blasting jobs. The performance of the Power Gun approaches that of a small pressure system, but does not require a pressure vessel nor does it require the set-up time and maintenance of a pressure system.

1.4 Components and Operating Principles

1.4.1 Components

1.4.1.1 The components of the Power Gun are shown in Figure 1.

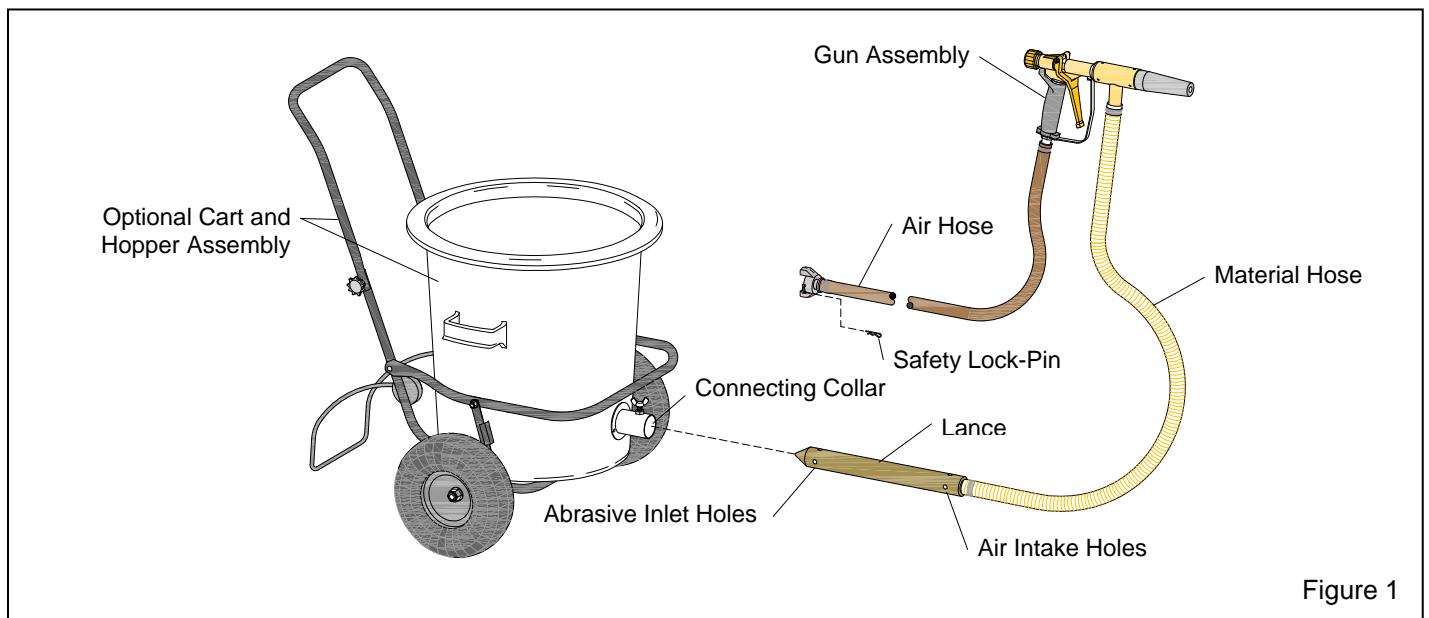


Figure 1

1.4.2 Operating Principals

1.4.2.1 When compressed air is supplied to the gun, and the trigger-lever is pulled, air flows through the gun, creating a partial vacuum in the material hose. As a result, abrasive is drawn into the lance, through the material hose and into the gun assembly. Abrasive mixes with the air stream at the gun, and is propelled out the nozzle.

1.4.3 Hose Limitations

1.4.3.1 Material Hose: The standard Power Gun assembly comes with 16 feet of material hose. Up to 30 feet may be used if adequate pressure is maintained at the gun, and if the nozzle and jet are maintained as noted in Section 6.0.

1.4.3.2 Air hose: The standard Power Gun assembly comes with 16 feet of air hose. Additional hose may be added, provided adequate pressure is maintained at the gun.

2.0 COMPRESSED-AIR and ABRASIVE

2.1 Compressed Air Requirements

2.1.1 The table in Figure 2 shows approximate air consumption (cfm) at various pressures (psi) for the Power Gun alone. Additional air is needed for a supplied-air respirator, plus other air tools that may be in use at the same time as the Power Gun. The table shows air consumption; it does not show the recommended compressor size. Check with a compressor supplier for the recommended compressor based on total compressed-air requirements.

2.1.2 For most applications, the compressor should be large enough to maintain 80-100 psi under working conditions. Delicate work may require lower pressure, and tough applications may require higher pressure.

2.1.3 The air jet orifice is 1/4" ID and the nozzle orifice is 1/2" ID.

Air consumption in cfm								
PSI	40	50	60	75	90	100	120	140
CFM	40	50	60	70	80	90	105	120

Figure 2

2.2 Abrasive

2.2.1 Abrasive Size: The Power Gun utilizes common abrasives that are 12 mesh and finer. Limited air supply, low blast pressure, or heavy abrasive may limit abrasive to smaller sizes.

2.2.2 Use only abrasives specifically manufactured for blast cleaning, that are compatible with the surface being blasted. Abrasive produced for other applications may be inconsistent in size and shape, and produce an unsatisfactory finish. Some abrasive may contain salts, corrosives, or other materials that could contaminate the surface being blasted.

⚠ WARNING

Obtain a material safety data sheet (MSDS) for the blast abrasive. Abrasive blasting with sands containing crystalline (free) silica can lead to serious or fatal respiratory disease. As NIOSH recommends, do not use abrasives containing more than trace amounts (more than one percent) of free silica.

3.0 SET-UP

3.1 An air filter is recommended in the air supply to remove condensed moisture from the air line.

3.2 Connect the Power Gun's air hose to a 3/4" or larger air supply. An isolation valve is required at the air source to enable depressurization.

3.3 Secure all compressed-air supply hose connections with safety lock pins to prevent accidental disconnection. Lock pins are listed in Section 8.1.

⚠ WARNING

Hose disconnection while under pressure could cause serious injury or death. Use safety lock pins at all coupling connections to prevent hose couplings from accidental disconnection.

3.4 Make sure the setscrews securing the nozzle, jet, and gun assembly are tight.

4.0 OPERATION

4.1 Operator Safety Equipment

4.1.1 Operators and **anyone else that may be exposed to the hazards generated by the blasting process** must wear appropriate protective gear, including abrasive-resistant clothing, leather gloves, eye and hearing protection, and a NIOSH-approved Type CE Supplied-Air Respirator.

4.1.2 Don all protective blasting attire in a clean non-hazardous environment outside the blast area, free of contaminants, where the air is safe to breathe.

4.1.3 When finished blasting, and after cleanup is completed, remove the respirator and protective clothing in a clean environment, outside the blasting area, and where the air is safe to breathe.

4.2 Operation with Hopper Option

4.2.1 The hopper and cart assembly must be placed on a firm and level surface.

WARNING

The four-wheel cart rolls easily. It must remain on sound, level ground. Do not place the cart on scaffolding. Do not use on elevated surfaces unless it is adequately anchored to prevent movement.

4.2.2 Insert the lance about halfway into the connecting-collar, and tighten the thumbscrew to secure the lance. Pour abrasive into the hopper; remove any foreign material that may fall in.

4.2.3 Before pouring abrasive into the hopper, make sure the cart's rear support bar is down. Pour abrasive into the hopper; remove any foreign material that may fall in. Do not fill the hopper to a level that impairs easy maneuvering.

Note: Bagged abrasive may be placed inside the hopper, and the lance inserted into the bag as described below.

4.3 Operation without Hopper Option

4.3.1 Abrasive may be kept in the bag, or poured into a hopper, bucket or similar container. Insert the lance into the abrasive, making sure the upper (air-intake) holes remain open, and outside of the abrasive.

4.3.2 To use bagged abrasive, pierce the bag with the pointed end of the lance. Insert the lance into the

abrasive. Using bagged abrasive requires repositioning of the lance as the abrasive level drops.

4.3.3 Pressurize the air supply line.

4.3.4 Put on the appropriate protective gear, including a NIOSH approved supplied-air respirator, abrasive resistant clothing, leather gloves, and hearing protection as required.

4.3.5 Hold the gun approximately 6 inches from the blast surface, and squeeze the trigger lever. Adjust the stand off distance and angle for optimum performance.

4.3.6 Stop blasting by releasing the trigger lever.

4.7 Shutdown

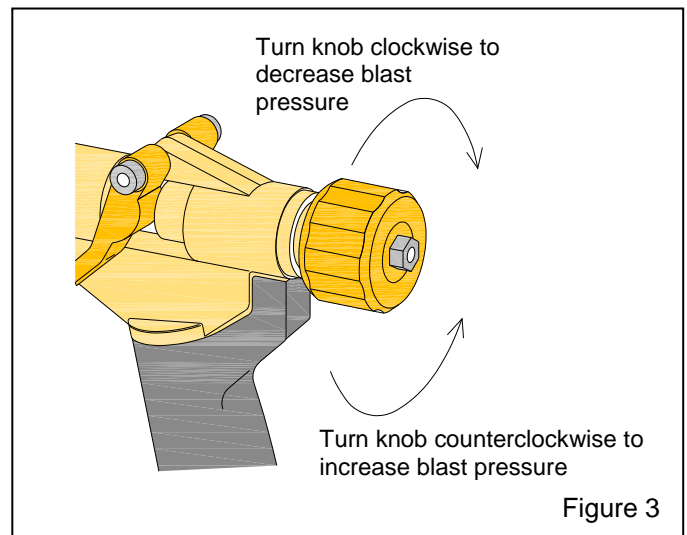
4.7.1 When finished blasting, remove the lance from the abrasive and shake abrasive from the material hose. If conditions are safe to do so, pull the trigger to further empty the hose.

4.7.2 Depressurize the air supply line and shutdown the compressor.

5.0 ADJUSTMENTS

5.1 Air Control Knob, refer to Figure 3

5.1.1 The control knob adjusts the force of air (blast pressure) coming out the nozzle. Turning the knob clockwise decreases the blasting force for delicate jobs, and turning it counterclockwise increases the blast force for tougher jobs.

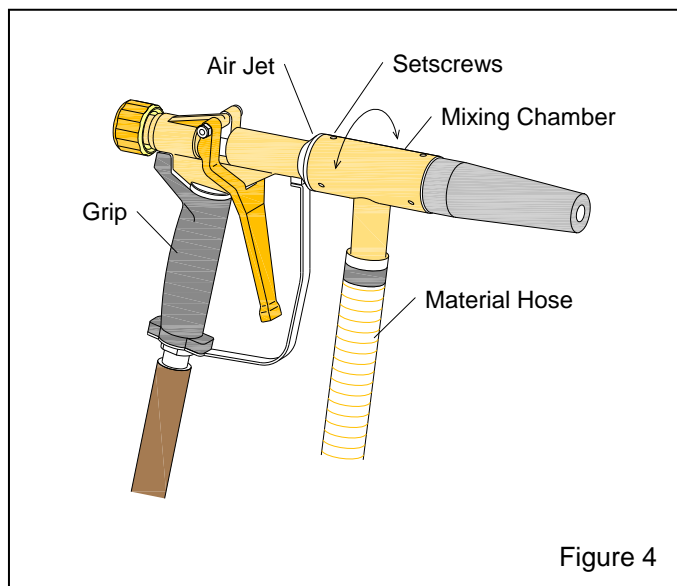


5.2 Hand Positioning, Figure 4

5.2.1 To change the orientation of the material hose with that of the handle grip, loosen the three setscrews securing the mixing chamber to the air jet assembly.

5.2.2 Rotate the mixing chamber to obtain the most comfortable position while holding the grip assembly and material hose.

5.2.3 Make sure the jet is fully seated into the mixing chamber before tightening the setscrews.



6.0 MAINTENANCE

⚠ WARNING

Failure to observe the following procedure before performing any maintenance or service could cause serious injury or death from the sudden release of compressed air.

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

6.1 Periodically inspect the air jet, mixing chamber, nozzle, and material hose for wear.

6.1.1 A new nozzle has a 1/2" ID orifice. Replace the nozzle when its diameter has increased by more than 1/16" (9/16" ID) or sooner if suction diminishes noticeably.

6.1.2 Replace the air jet when wear reaches the orifice, and affects the overall length. New air jet orifices are 1/4" ID, and extend approximately 1-5/16" from the jet body.

6.2 Periodically inspect the grip and trigger assembly for air leaks. Repair at the first sign of leaks.

7.0 TROUBLESHOOTING

⚠ WARNING

Failure to observe the following procedure before performing any maintenance or service could cause serious injury or death from the sudden release of compressed air.

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

7.1 No Abrasive Flow

7.1.1 Foreign material in the mixing chamber assembly. Remove nozzle and check for blockage in the suction head and nozzle.

7.1.2 Abrasive blockage in the material hose. If the material hose packs with abrasive, it is a sign that the abrasive mixture is too rich. Make sure the air-intake holes in the lance are open.

7.1.3 Worn nozzle. Replace nozzle when the orifice is worn to 9/16", or sooner if production decreases noticeably.

7.1.4 Air jet worn. Inspect end of air jet and replace when wear reaches the orifice.

7.1.5 Air jet and/or nozzle not seated correctly. The jet and nozzle must be fully seated into the mixing chamber, and the setscrews must be tight.

7.1.6 Abrasive bridging at the lance's abrasive inlet holes. Frequent bridges or blockage are most likely caused by damp abrasive. Refer to Section 7.3.

7.1.7 Hole worn in material hose. Inspect hose for holes and inspect the clamps for leaks. Repair as needed.

7.2 Plugged Nozzle

7.2.1 Foreign material in the nozzle. Clean and re-install.

7.2.2 Abrasive mixture too rich. Make sure the air-intake holes in the lance are open.

7.3 Abrasive Bridging

7.3.1 Frequent bridging or blockage at the lance can be caused by damp abrasive. Some abrasives tend to absorb moisture from the air, especially fine-mesh abrasives in high-humidity areas. Empty the material hose and hopper of abrasive, and store the abrasive in an airtight container when not in use.

7.4 Neither Air nor Abrasive Comes Out the Nozzle When the Trigger is Pulled.

7.4.1 Inspect the nozzle for blockage. Refer to Section 7.2.

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

7.5 Air Does Not Stop When Trigger is Released

7.5.1 Binding at the trigger, rod, or rod guide. Clean abrasive from parts and inspect for cause of resistance.

7.5.2 Worn or damaged rod tip or obstruction between the rod tip and air jet. Repair as needed.

7.6 Abrasive Surge

7.6.1 Abrasive flow is too rich. Make sure the air-intake holes in the lance are open.

7.7 Poor Suction in Material Hose

7.7.1 Inadequate air supply. Refer to the table in Figure 2.

7.7.2 Blockage in material hose or nozzle. Refer to Sections 7.1 and 7.2.

7.8 Blow-Back Through Material Hose

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

7.9 Air Leak at the Grip and Trigger Assembly

7.9.1 Faulty rod seal. Replace seal.

8.0 REPLACEMENT PARTS

8.1 Assembly Replacement Parts, Figure 5

Item	Description	Stock No.
(-)	Power gun assembly with cart and hopper with 16-ft air and material hose	99860
	with 30-ft. air and material hose	24687
(-)	Power gun less cart and hopper with 16-ft air and material hose	90253
	with 30-ft. air and material hose	24688
1.	Blast gun assembly Refer to Figure 6 for individual parts	100477

2.	Lance	90214
3.	Hose, material, bulk specify feet required 16 ft. is standard length	24778
4.	Hose, air, bulk, specify feet required 16 ft. is standard length	24779
5.	Clamp, material hose	24780
6.	Clamp, air hose	12756
7.	Coupling, air hose	00595
8.	Lock pin, package of 25	11203
9.	Hopper and lid	25589
10.	Cart assembly	25591
11.	Hopper and cart assembly	99899

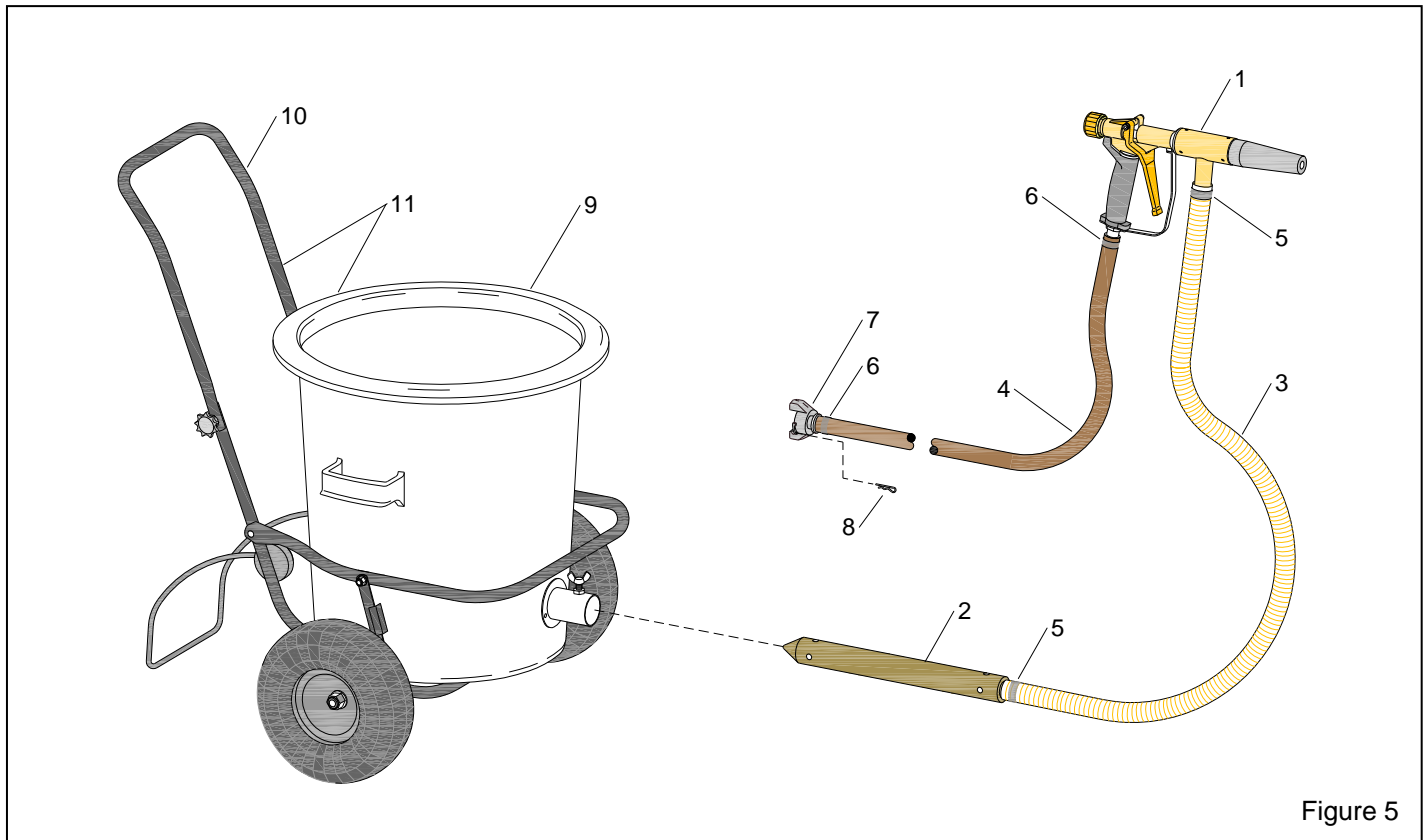


Figure 5

8.2 Blast Gun Assembly, Figure 6

Item	Description	Stock No.
(-)	Blast gun assembly includes all items shown in Figure 6 ...	100477
1.	Grip and trigger assembly	90208
2.	Nozzle	90209
3.	Air jet	90213
4.	Mixing chamber	90366

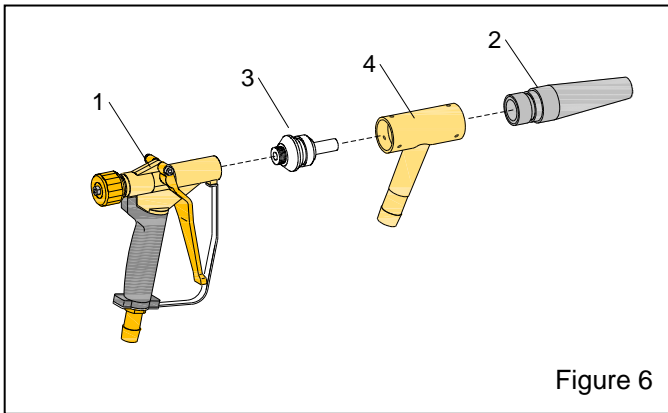


Figure 6

8.3 Grip and Trigger Assembly, Figure 7

Item	Description	Stock No.
(-)	Grip and trigger assembly includes all items shown in Figure 7	90208
1.	Knob, control	90584
2.	Bushing, knob stem	90585
3.	Nut, control knob retaining	90586
4.	Stem, control knob	90587

5.	Screw, stem stop	90588
6.	Spring, control knob	90589
7.	Spring, return	90590
8.	Guide, rod	90591
9.	Setscrew, rod guide	90592
10.	Plug, rod and seal	90593
11.	Rod and tip assembly	90594
12.	Seal, rod	90595

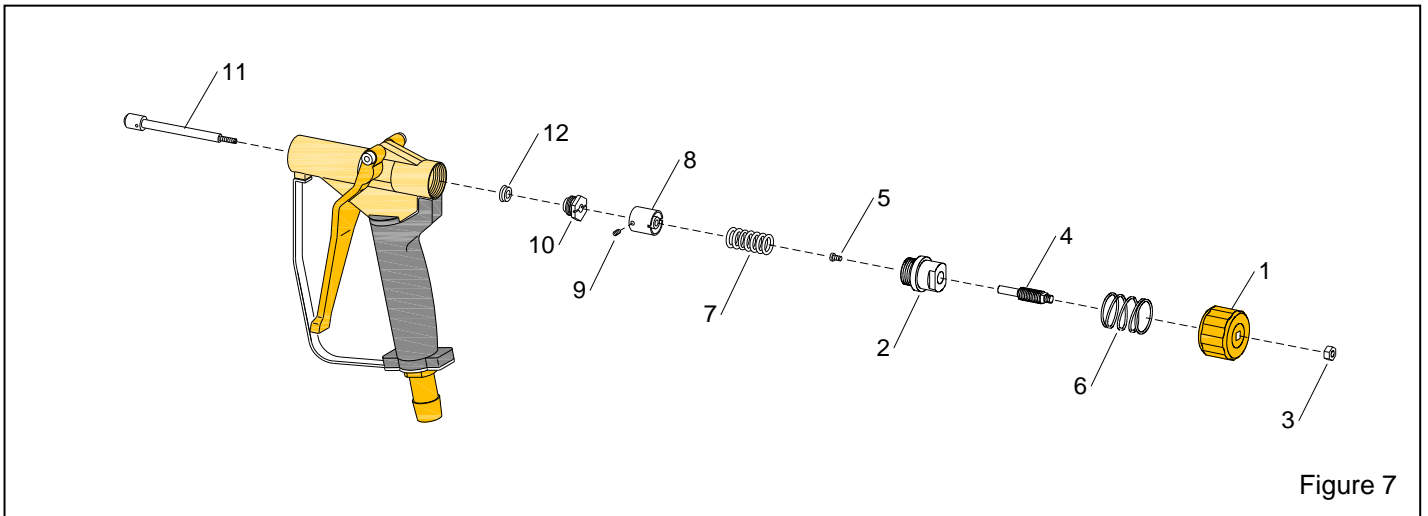


Figure 7