

**SG-300 SUCTION GUN
SUCTION ABRASIVE BLAST TOOL
O. M. 06165**

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! WARNING

Do not use this equipment until you have READ 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 important information.

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WARNING

- Employers are responsible for identifying all job site hazards, educating and training all persons who will operate and maintain these products, and ensuring that all blast operators and their assistants understand the warnings and information contained in these instructions relating to safe and proper operation and maintenance of this equipment.
- Serious injury or death can result from failure to comply with all Occupational Safety and Health Administration (OSHA) regulations and all manufacturer's instructions.
- This equipment is not intended for use in any area considered hazardous per National Electric Code NFPA 70 2011, Article 500.
- Read this document and follow all instructions before using this equipment.

OSHA regulations relating to abrasive blasting are contained in the Code of Federal Regulations, Title 29 (29 CFR 1910 General Industry; 1915 Maritime; 1926 Construction). The most pertinent include: 1910.94 Ventilation, 1910.95 Occupational Noise Exposure, 1910.132 Personal Protective Equipment, 1910.133 Eye and Face Protection, 1910.134 Respiratory Protection, 1910.135 Head Protection, 1910.244 (b) Remote Controls. Consult www.osha.gov for complete information.

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.

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.

Abrasive blast equipment is only one component of an abrasive blasting job. Other products, such as air compressors, air filters and receivers, abrasives, scaffolding, hydraulic work platforms or booms, equipment for lighting, painting, ventilating, dehumidifying, parts handling, or specialized respirators 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 job for warnings, information, training, and instruction relating to the proper and safe use of their equipment.

GENERAL INSTRUCTIONS

This material describes some, but not all, of the major requirements for safe and productive use of blast machines, remote controls, respirator systems, and related accessories. All equipment and accessories must be installed, tested, operated and maintained only by trained, knowledgeable, experienced users.

The blast operator and all workers in the vicinity must be properly protected from all job site hazards including those hazards generated by blasting.

Work environments involving abrasive blasting present numerous hazards. Hazards relate to the blast process from many sources that include, but are not limited to, dust generated by blasting or from material present on the surface being blasted. The hazards from toxic materials may include, but are not limited to, silica, cyanide, arsenic, or other toxins in the abrasives or in the coatings, such as lead or heavy metals. Other hazards from toxins include, but are not limited to, fumes from coating application, carbon monoxide from engine exhaust, contaminated water, chemicals or asbestos. In addition, physical hazards that may be present include, but are not limited to, uneven work surfaces, poor visibility, excessive noise, and electricity. Employers must identify all job site hazards and protect workers in accordance with OSHA regulations.

Never modify Clemco equipment or components or substitute parts from other manufacturers for any Clemco components or parts. Any unauthorized modification or substitution of supplied-air respirator parts violates OSHA regulations and voids the NIOSH approval.

IMPORTANT

Contact Clemco for free booklets:

Blast Off 2 – Guide to Safe, Productive, and Efficient Abrasive Blasting, and Abrasive Blasting Safety Practices – Guide to Safe Abrasive Blasting.

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OPERATIONAL INSTRUCTIONS

OPERATOR SAFETY EQUIPMENT

WARNING

- OSHA regulation 1910.134 requires appropriate respiratory protection for blast operators and workers in the vicinity of blasting. These workers must wear properly-fitted, properly-maintained, NIOSH-approved, respiratory protection that is suitable for the job site hazards. Blast respirators are to be worn only in atmospheres not immediately dangerous to life or health from which wearers can escape without use of the respirator.
- The employer must develop and implement a written respiratory protection program with required worksite- specific procedures and elements for required respirator use. The employer must provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary.
- NEVER use abrasives containing more than one percent crystalline silica. Fatal diseases, such as silicosis, asbestosis, lead or other poisoning, can result from inhalation of toxic dusts, which include, but are not limited to, crystalline silica, asbestos, and lead paint. Refer to NIOSH Alert 92-102; and OSHA CPL 03-00-007: “National Emphasis Program – Crystalline Silica”, in which OSHA describes policies and procedures for implementing a national emphasis program to identify and reduce or eliminate health hazards from exposure to crystalline silica. Numerous topics associated with the hazards of crystalline silica in silica blasting sand can be found on [http:// osha.gov/](http://osha.gov/). Clemco urges users of silica blasting sand to visit this website, and read and heed the information it contains.
- Always make sure the breathing air supply (respirator hose) is not connected to plant lines that supply gases that include, but are not limited to, oxygen, nitrogen, acetylene, or other non-breathable gas. Never modify or change respirator air line connections without first testing the content of the line for safe breathing air. Failure to test the line may result in death to the respirator user.

- Breathing air quality must be at least Grade D, as defined by the Compressed Gas Association specification G-7.1, per OSHA Regulation 29 CFR 1910.134. When compressed air is the breathing air source, a Clemco CPF (suitable sorbent bed filter) should be used. Respirator hose connecting the respirator to the filter must be NIOSH approved. Non- approved hose can cause illness from chemicals employed to manufacture the hose.

- All workers must always wear NIOSH-approved respirators when any dust is present. Exposure to dust can occur when handling or loading abrasive, blasting, cleaning up abrasive, or working in the vicinity of blasting. Before removing the respirator, test the air with a monitoring device to ensure it is safe to breathe.

- Clemco respirators DO NOT remove or protect against carbon monoxide or any other toxic gas. Monitoring devices must be used in conjunction with the respirator to ensure safe breathing air. Always locate compressors and ambient air pumps where contaminated air will not enter the air intake.

- Always use Clemco lenses with Clemco respirators; installing non-approved lenses voids the NIOSH approval. Respirator lenses are designed to protect the wearer from rebounding abrasive; they do not protect against flying objects, heavy high-speed materials, glare, liquids, or radiation.

INDUSTRY ORGANIZATIONS

For additional information, consult:

Occupational Safety and Health Administration (OSHA) - www.osha.gov

Compressed Gas Association (CGA) - www.cganet.com

The Society for Protective Coatings (SSPC) - www.sspc.org

National Association of Corrosion Engineers (NACE) - www.nace.org

American Society for Testing and Materials (ASTM) - www.astm.org

National Institute of Occupational Safety and Health (NIOSH) - www.niosh.gov

American National Standards Institute (ANSI) - www.ansi.org

PREFACE

BLAST MACHINES AND REMOTE CONTROLS

⚠ WARNING

OSHA regulation 1910.169 describes the necessity of pressure relief valves on compressed air equipment. Do not operate blast machines with air compressors that are not equipped with properly functioning pressure relief valves.

OSHA regulation 1910.244(b) requires the use of remote controls on blast machines.

Serious injury or death can result from many sources, among them:

- Involuntary activation of the remote controls. Never modify or substitute remote control parts; parts are not compatible among different manufacturers. Welding hose is not suitable for remote control hose. Its ID and material composition make it unsafe for remote control use.
- Exceeding the maximum working pressure. Clemco blast machines are built to ASME-code and carry a 'U' or 'UM' stamp, and National Board/serial number. Every machine is marked with its maximum working pressure. Never exceed the maximum working pressure limits of the blast machine.
- Uncontrolled blast stream. High-velocity abrasive particles will inflict serious injury. Always point the blast nozzle in the direction of the blast surface only. Keep unprotected workers out of the blast area.
- Welding on the blast machine. Never weld on the blast machine; welding voids the National Board approval and may affect the dimensional integrity of the vessel.
- Moving the blast machine. Never manually move a blast machine containing abrasive, any machine containing abrasive must be moved with appropriate mechanical lifting equipment.

HOSES, COUPLINGS, AND NOZZLE HOLDERS

- The inside diameter (ID) of air hoses, fittings, and connections should be at least four times larger than the nozzle orifice size. Blast hose ID should be three to four times the size of the nozzle orifice. Example: a #6 nozzle (3/8" diameter orifice) calls for 1-1/2" ID blast hose and 1-1/2" ID or larger compressor hose. All hose runs should be kept as short as possible and run in as straight a line as possible to reduce pressure loss.
- To install, squarely cut the end of the hose so that it fits snugly against the coupling or hose end shoulder. Always use the screws recommended by the manufacturer ensuring that they do not penetrate the inner wall. Make sure the couplings tightly fit the hose. Install cotter pins at every connection or use couplings with built-in lock-springs to prevent disengagement. Install safety cables at all connections to prevent whipping if hoses disengage or blow out.

MAINTENANCE AND REPAIR

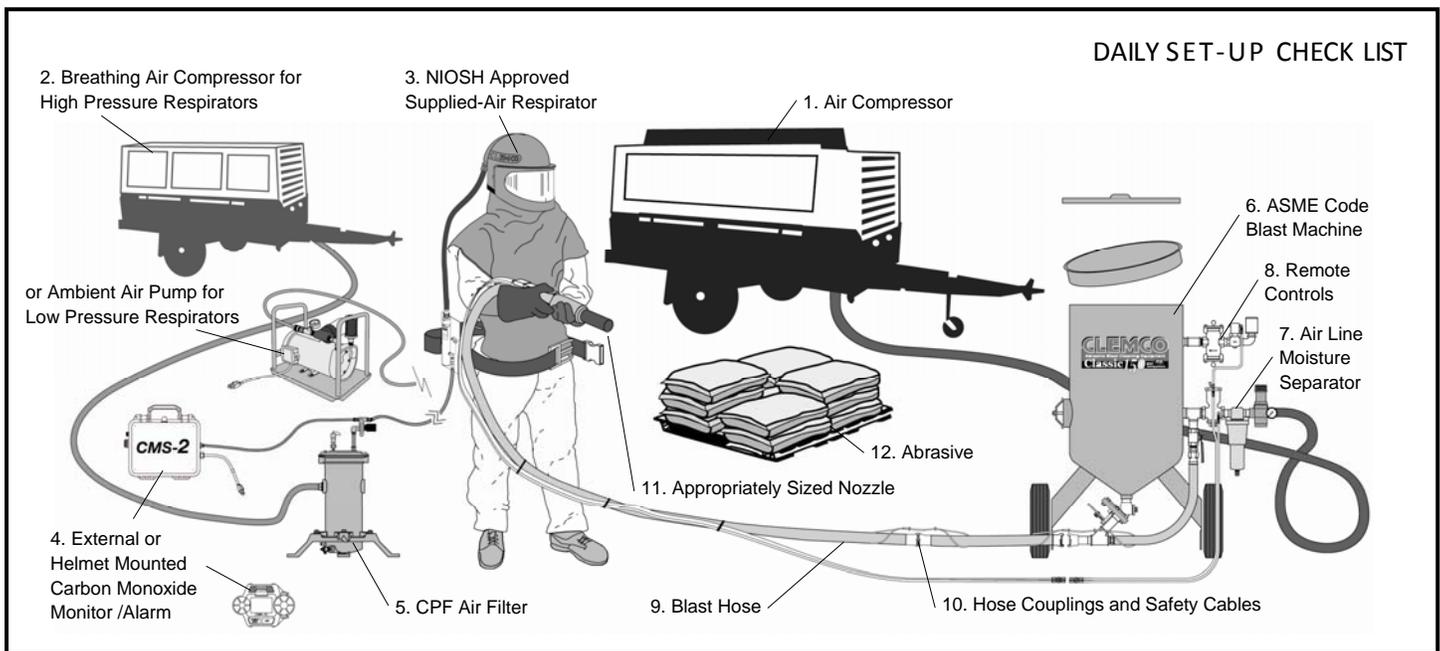
- Completely read and follow all service instructions and recommended maintenance intervals. Always shut off compressor and depressurize blast machine before performing any maintenance. At every service interval, clean all filters, screens, and alarm systems. If spring-loaded abrasive valves are used, always cage spring before disassembly.

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 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 the 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 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 the 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 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.

PREFACE



DAILY SET-UP CHECK LIST

Make sure all blast operators are properly trained and suitably attired with a blast suit, safety boots, leather gloves, respiratory and hearing protection. Every day before start up, check all equipment components, including piping, fittings, and hoses, and valves, for leaks, tightness, and wear. Repair or replace as needed. Use the following checklist.

- 1. PROPERLY-MAINTAINED AIR COMPRESSOR** sized to provide sufficient volume (cfm) at given pressure for nozzle and other tools. ADD 50% volume (cfm) reserve to allow for nozzle wear. Use large compressor outlet and air hose (at least 4 times the nozzle orifice diameter). For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm. Follow the manufacturer's checklist and maintenance instructions.
- 2. BREATHING-AIR COMPRESSOR** (or oil-less ambient air pump) capable of providing Grade D quality air, located in a dust free area. Read # 1 above.
- 3. CLEAN, PROPERLY-MAINTAINED NIOSH-APPROVED SUPPLIED-AIR RESPIRATOR** worn by blast operators, and other workers exposed to blast dust. Make sure all respirator components are in place — all lenses, inner collar, and cape. Thoroughly inspect all components for wear. The NIOSH approval (approval number is listed in the owner's manual) is for a complete assembly from point of attachment on the CPF (sorbent bed) filter to the complete respirator. Substitution of any part voids the NIOSH approval.
- 4. CARBON MONOXIDE MONITOR/ALARM** installed at the CPF filter or inside the supplied-air respirator for monitoring for the presence of deadly CO gas and warning the operator(s) when the CO level reaches an unacceptable level. When an ambient air pump is used for breathing air, a CO monitor provides a measure of safety. Read # 1 above.
- 5. BREATHING-AIR FILTER (OSHA-REQUIRED sorbent bed filter)** for removal of moisture and particulate matter in the compressed air breathing-air supply. Monitor the condition of the cartridge and replace when odor is detected or at 3 month intervals, whichever comes sooner. The breathing air filter does NOT detect or remove carbon monoxide (CO). Always install a CO monitor/alarm.
- 6. BLAST MACHINE** (bearing U or UM stamp, National Board Number, and Maximum Working Pressure) sized to hold a 30-minute abrasive supply. Examine pop-up valve for alignment. Check piping, fittings, screens, valves for tightness, leaks, and wear. Always ground the machine to eliminate hazard of static shock. Install a blast machine screen to keep out foreign objects. Use a blast machine cover if left outdoors overnight. Never exceed the maximum working pressure of the vessel.
- 7. AIR LINE FILTER** (moisture separator) installed as close as possible to the blast machine inlet and sized to match the size of the inlet piping or larger air supply line. Clean filter and drain often. Damp abrasive causes operational problems.
- 8. REMOTE CONTROLS** are required by OSHA and must be in perfect operating condition. Test and check all components to ensure all parts are present and fully functional. Use genuine replacement parts. NEVER mix parts from different manufacturers. Never use welding hose for remote control hose.
- 9. BLAST HOSE** should have an inside diameter sized to suit the blast nozzle. The ID should be three to four times the size of the nozzle orifice diameter. Blast hose should be arranged in as straight a line as possible from the blast machine to the work area, avoiding sharp bends.
- 10. COUPLINGS AND NOZZLE HOLDERS** should fit snugly on the hose and be installed with manufacturer recommended screws. Coupling lugs must snap firmly into locking position. Gasket must always be used to form a positive seal, and cotter pins must be installed. Replace gasket when wear, softness or distortion is detected. Check nozzle holder for thread wear; replace at any sign of wear. Install safety cables at all connections.
- 11. NOZZLE** orifice size should be checked and nozzle replaced when worn 1/16" from original size. (No. 5 nozzle has 5/16" orifice diameter; replace when it measures 3/8"). Threads should be inspected daily for wear and nozzle should be replaced when wear is detected. Always use a nozzle washer.
- 12. ABRASIVE** must be a material specifically manufactured for blasting. It should be properly sized for the job. Check material safety data sheet for free-silica, cyanide, arsenic, lead and other toxins and avoid use when these toxic, harmful substances are present.
- SURFACE TO BE BLASTED** should be examined for hazardous substances. Take appropriate protective measures as required by OSHA to ensure the blast operator, other workers in the vicinity, and any bystanders are properly protected.

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1.0 INTRODUCTION

1.1 Scope of manual

1.1.1 This manual covers the installation, operation, maintenance, and replacement parts of the Clemco SG-3000 Suction Gun.

1.1.2 All personnel involved with the abrasive blasting process must be made aware of the hazards associated with abrasive blasting. The Clemco booklet "Abrasive Blasting Safety Practices" is included with every blast machine; it contains important safety information about abrasive blasting that may not be included in equipment operation manuals. To request additional copies, email info@clemcoindustries.com.

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 General Description

1.3.1 The SG-300 is a suction-type abrasive blasting tool. The suction gun is ideally suited for light-duty, small, and touchup blasting jobs. The suction gun 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 Components of the SG-300 suction gun system are shown in Figure 1.

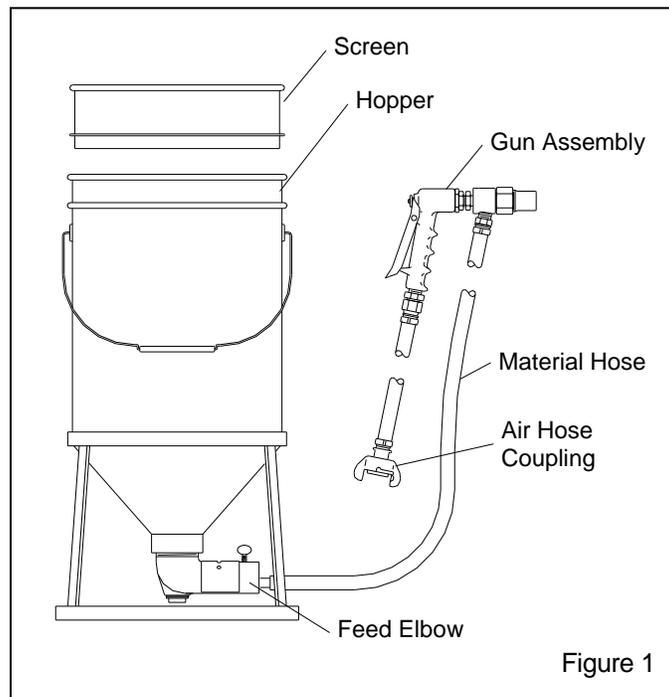


Figure 1

1.4.2 Operating Principles

1.4.2.1 When compressed air is supplied to the gun, and the trigger-handle is squeezed, air flows through the gun, creating a partial vacuum in the material hose. As a result, abrasive is drawn through the material hose into the gun assembly. Abrasive mixes with the air stream at the gun, and is propelled through the nozzle, onto the surface being blasted.

1.4.3 Hose Limitations

1.4.3.1 Material Hose: The material hose is limited to 10 feet.

1.4.3.2 Air hose: The suction gun assembly comes with 10-feet of air hose. If additional air hose is required, use 1/2" ID or larger hose.

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 suction gun. Additional air is needed for a supplied-air respirator, plus other air tools used at the same time as the suction gun. The table shows air consumption; it does not show the recommended compressor size. Check with a compressor supplier for recommendations 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.

2.1.3 Unless otherwise specified at the time of order, the suction gun is supplied with a 1/8" diameter air jet and a 5/16" diameter nozzle. Refer to the table in Figure 2 for other jet and nozzle combinations. Typically the nozzle should be at least twice the diameter of the jet. The 1/16" air jet and 1/8" nozzle combination should be used only when the air supply (cfm) is limited and for very light duty use.

| Jet | Nozzle | * Abrasive Mesh Range | PSI | | |
|-------|--------|-----------------------|-----|----|----|
| | | | 40 | 60 | 80 |
| 1/16" | 1/8" | 30 – 180 | 3 | 4 | 6 |
| 1/8" | 5/16" | 30 – 180 | 13 | 17 | 22 |
| 3/16" | 3/8" | 20 – 180 | 28 | 38 | 48 |
| 1/4" | 1/2" | 16 – 180 | 49 | 67 | 85 |

Air consumption in cfm

* Maximum recommended size for steel abrasive is 30 mesh

Figure 2

2.2 Abrasive

2.2.1 Abrasive Size: Refer to the table in Figure 2. The SG-300 utilizes common abrasives that are 16-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 dry blasting and that are compatible with the surface being blasted. Abrasive produced for other applications may be inconsistent in size and shape, contain particles that could jam the suction gun, produce an unsatisfactory finish.

⚠ WARNING

Obtain a safety data sheet (SDS) 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 suction gun air hose to a 3/4" or larger air supply line. 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 coupling connections to help prevent hose couplings from accidental disconnection.

3.4 Make sure the nozzle is screwed into the nozzle nut until it stops against the suction body. Do not use a wrench for tightening the blast nozzle. A wrench will crack the liner. Screw it in hand tight only.

NOTICE

If the nozzle is not fully seated, accelerated wear can occur on the nozzle, nut, and body, and there will be a noticeable decrease in blasting production.

4.0 OPERATION

4.1 Operator Safety Equipment

4.1.1 Operators and anyone else 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 protective blasting attire outside the blast area, in a clean non-hazardous environment, 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 outside the blasting area, in a clean environment where the air is safe to breathe.

4.2 Loading Abrasive into Hopper and Prepare for blasting

4.2.1 Place the screen over the hopper and load abrasive into the hopper by pouring it through the screen.

4.3 Insert the material hose midway into the feed elbow at the bottom of the hopper, as noted in Figure 4. The slot in the adjusting sleeve should be facing up so that the hose may be observed.

4.4 Pressurize the air supply line.

4.5 Don blasting attire as noted in Section 4.1.

4.6 To blast, 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.

4.7 To stop blasting, release the trigger lever.

4.8 Shutdown

4.8.1 When finished blasting, remove the material hose from the feed elbow and shake abrasive from the material hose. Only if conditions are safe to do so, squeeze the trigger to further empty the hose.

4.8.2 Depressurize the air supply line and shutdown the compressor.

5.0 ADJUSTMENTS

5.1 Air Jet, Figure 3

5.1.1 Adjust the air jet by loosening the set screw in the suction body and moving the jet in or out of the body. This adjustment controls suction in the material hose. Maximum suction is obtained when the jet is 1/16" to 1/8" from full forward, as shown in Figure 3.

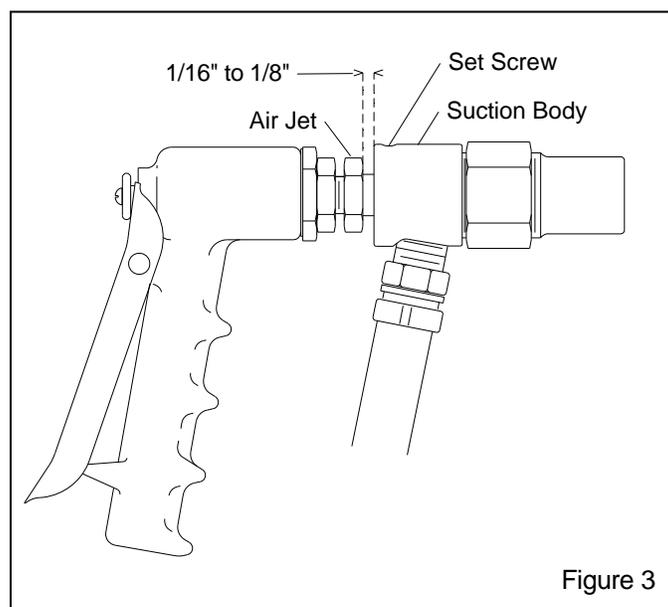


Figure 3

5.2 Abrasive/Air Mixture, Figure 4

5.2.1 The air-to-abrasive ratio (abrasive/air mixture) is controlled by how far the material hose is inserted into the abrasive within the feed elbow. Begin with the material hose inserted into the abrasive leaving the top half of the hose open to air, as shown in Figure 4. To maintain smooth abrasive flow, a generous volume of air with abrasive must be drawn into the hose.

5.2.2 To adjust, rotate the adjusting sleeve so the slot is facing up, and the abrasive can be observed. Loosen the thumb screw in the feed elbow and begin blasting. Check the blast stream, abrasive flow should be smooth and appear as a light mist coming from the nozzle.

5.2.3 If abrasive flow pulsates or surges, not enough air is entering the abrasive stream. While blasting, slowly pull the material hose away from the abrasive until abrasive flows smoothly.

5.2.4 If abrasive flow is too light, decrease air in the mixture by inserting the material hose further into the abrasive.

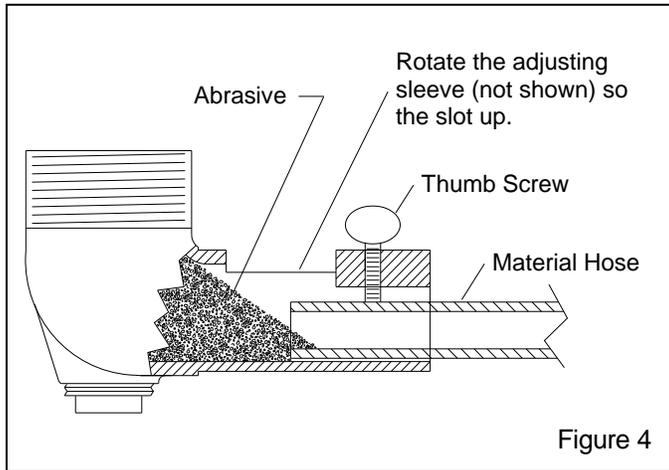


Figure 4

5.2.5 When the correct mixture is achieved, tighten the thumb screw only enough to prevent movement, and rotate the sleeve so the holes are facing upward.

6.0 MAINTENANCE

6.1 Air Jet Sleeve: Periodically inspect the rubber air jet sleeve and replace it when worn. Proper maintenance will prolong the life of the jet.

6.2 Valve Seat: Periodically inspect the neoprene valve seal and replace it when worn. Failure to replace the neoprene seal will cause the suction gun to leak, wasting air and resulting in damage to the brass seat.

6.3 Nozzle: Replace the nozzle when its diameter has increased by 1/16", or sooner if suction diminishes noticeably.

6.4 Periodically inspect the gun 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 from the sudden release of trapped compressed air.

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

7.1 No abrasive flow

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

7.1.2 Abrasive blockage in the material hose. Material hose packing with abrasive is a sign that the abrasive mixture is too rich (the material hose is inserted too far into the abrasive). Clear the hose as follows:

7.1.2.1 Remove the material hose from the feed elbow and put it in a bucket or other container. Raise the gun assembly to let the abrasive fall out of the hose and into the bucket. If the hose is packed and abrasive does not flow, use caution and continue as follows.

7.1.2.2 Remove the material hose from the feed elbow. Reduce line pressure. Press the outlet end of the nozzle against a flat surface and point the end of the material hose in a safe direction. Squeeze the trigger. Back-pressure will force the obstruction out of the material hose.

7.1.3 Worn nozzle. Replace the nozzle when the orifice is worn 1/16" larger than its original size, or sooner if production decreases noticeably.

7.1.4 Air jet worn. Inspect end of air jet and replace when wear reaches the orifice (ID of air jet), and affects the overall length.

7.1.5 Air jet requires adjustment. Check adjustment per Section 5.1.

7.1.6 Abrasive bridging in feed elbow. Frequent bridges or blockage in the area of the feed can be caused by damp abrasive. Refer to Section 7.3.

7.2 Plugged nozzle

7.2.1 Foreign material in the nozzle. Remove material.

7.2.2 Abrasive mixture too rich. Adjust abrasive/air mixture per Section 5.2.

7.3 Abrasive bridging

7.3.1 Frequent bridging or blockage in the feed elbow can be caused by damp abrasive. Some abrasive tends to absorb moisture from the air, especially fine-mesh abrasive 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 squeezed.

7.4.1 Make sure that the air compressor is ON and air supply valves are open.

7.4.2 Inspect nozzle blockage. Refer to Section 7.2.

7.5 Air does not stop when trigger is released

7.5.1 Worn or damaged valve seal or valve seat. Repair as needed.

7.6 Abrasive surge

7.6.1 Abrasive flow is too rich. Adjust per Section 5.2.

7.7 Poor suction in material hose

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

7.7.2 Air jet requires adjustment. Adjust per Section 5.1.

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

7.7.4 Air jet is worn. Inspect end of air jet and replace when wear reaches the orifice (ID of air jet), and affects the overall length.

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

7.7.6 Wrong jet/nozzle combination. Refer to the table in Figure 2 for correct jet and nozzle combinations.

7.7.7 Air jet sleeve extends past end of air jet. Cut the sleeve to length of the air jet.

7.7.8 Nozzle not fully seated against the suction body. Make sure the nozzle is screwed into the nozzle nut until it seats against the suction body.

7.8 Blow-back through material hose

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

7.8.2 Air jet may be too large for nozzle. Refer to the table in Figure 2.

7.8.3 Air pressure too high. Most suction blasting is done below 90 psi.

8.0 REPLACEMENT PARTS

8.1 Assembly Replacement Parts, Figure 5

| Item | Description | Stock No. |
|------|------------------------------------|-----------|
| (-) | SG-300 suction gun assembly | 02641 |
| 1. | SGLH suction gun less hopper. | 02643 |
| 2. | SGT air gun assembly | 02642 |
| 3. | Screen | 02673 |
| 4. | Hopper | 02675 |
| 5. | Feed elbow assembly | 02676 |
| 6. | Lock pin, package of 25..... | 11203 |

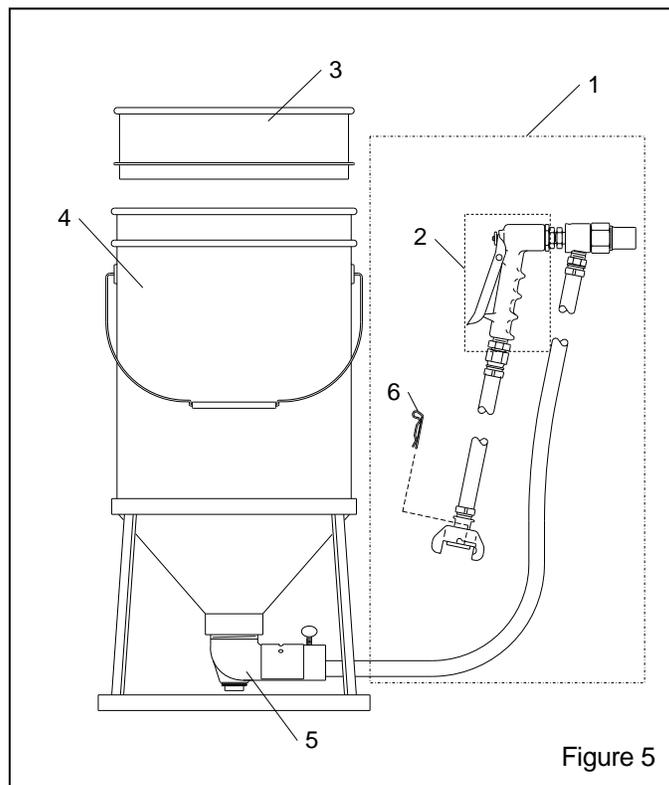


Figure 5

8.2 Feed Elbow Assembly, Figure 6

| Item | Description | Stock No. |
|------|--------------------------------|-----------|
| (-) | Feed elbow assembly | 02676 |
| 1. | Sleeve | 10809 |
| 2. | Screw, 1/4 NC x 1" thumb | 03131 |
| 3. | Plug, 1" plastic | 12011 |

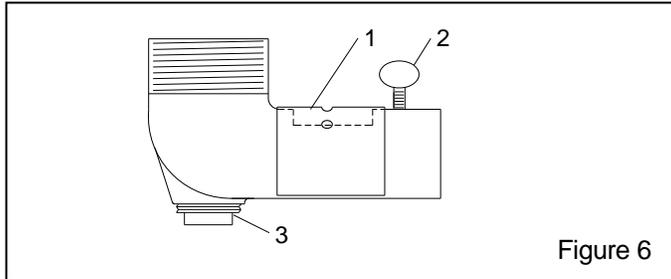


Figure 6

8.3 SGLH, Suction gun less hopper, includes gun assembly, nozzle, and hoses, Figure 7

| Item | Description | Stock No. |
|------|--|-----------|
| (-) | SGLH Suction gun less hopper | 02643 |
| 1. | Suction body | 02663 |
| 2. | Nut, suction body | 02664 |
| 3. | Hose, air assembly, 1/2" x 10 ft. | 02665 |

| | | |
|-----|---|-------|
| 4. | Hose, material assembly, 1/2" x 10 ft. | 02666 |
| 5. | Air jet, with sleeve | |
| | 1/16" orifice | 02659 |
| | 1/8" orifice (standard) | 02660 |
| | 3/16" orifice | 02661 |
| | 1/4" orifice | 02662 |
| 6. | Nut, lock | 02667 |
| 7. | Sleeve, air jet | 02668 |
| 8. | Screw, 1/4-NC x 1/4" set | 03075 |
| 9. | Nozzle, tungsten carbide | |
| | 3/16" orifice | 01352 |
| | 5/16" orifice (standard) | 01354 |
| | 3/8" orifice | 01355 |
| | 1/2" orifice | 01356 |
| 10. | Retaining ring | 02644 |
| 11. | Screw, 8-32 x 3/8" | 02645 |
| 12. | Washer, valve lift | 02646 |
| 13. | Spring, 3/8" I. D. x 1-1/8" long | 02647 |
| 14. | O-ring, 3/16" I. D. | 01992 |
| 15. | Valve stem | 02649 |
| 16. | Washer, No. 8 x 1/2" O. D. | 02648 |
| 17. | Seal, valve, 3/4" O. D. | 02650 |
| 18. | Seat, valve, brass | 02651 |
| 19. | Adaptor, hose connector | 02652 |
| 20. | Trigger, valve | 02653 |
| 21. | Body, valve | 02654 |
| 22. | Hinge pin, trigger | 02655 |
| 23. | Gasket, valve seat | 02657 |
| 24. | Lock pin, package of 25 | 11203 |

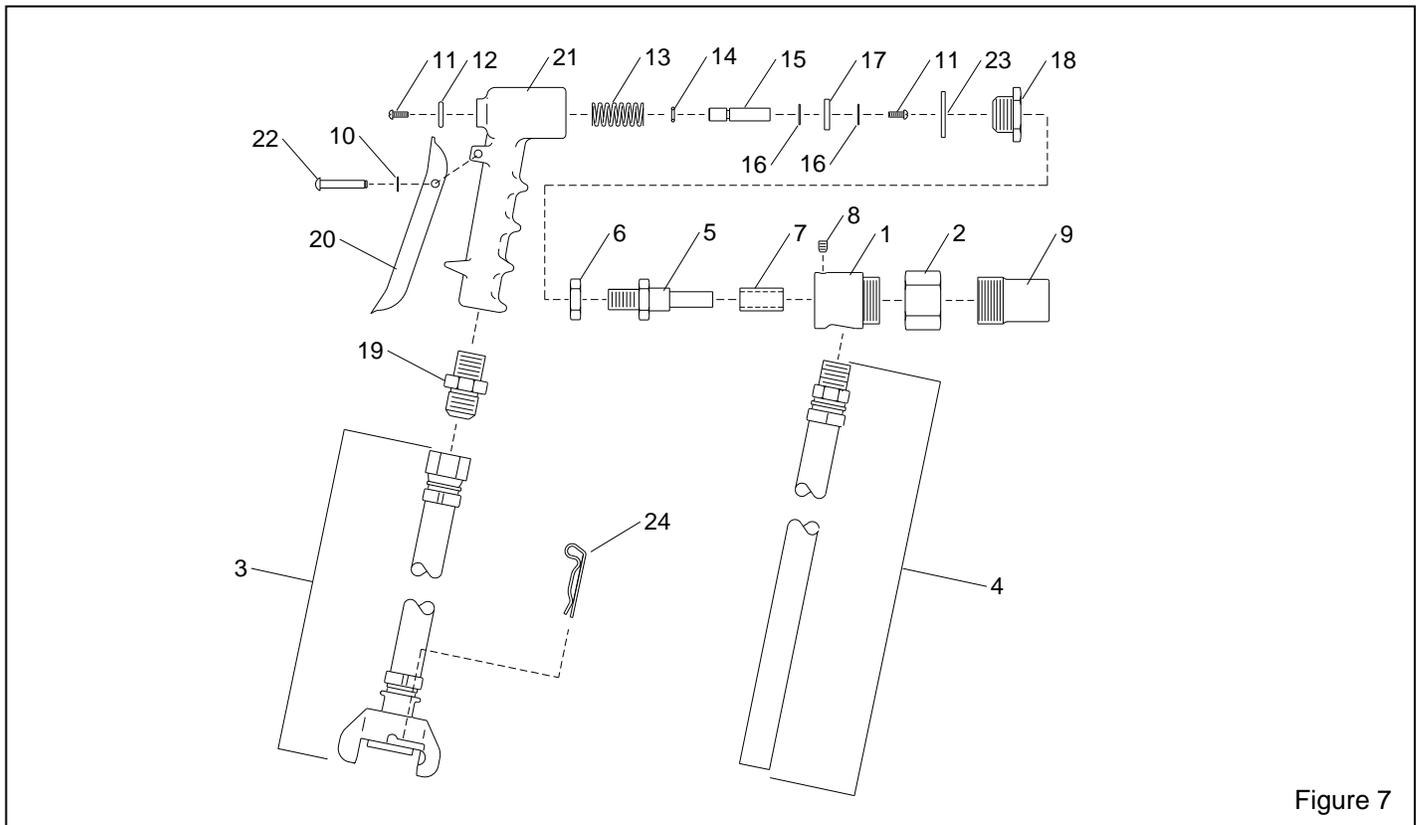


Figure 7