

**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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**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](mailto: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.

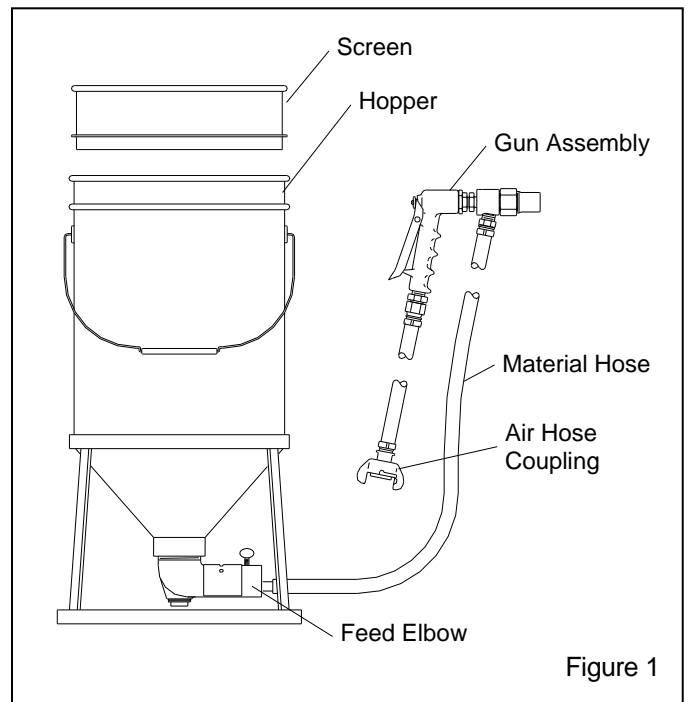


Figure 1

**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.

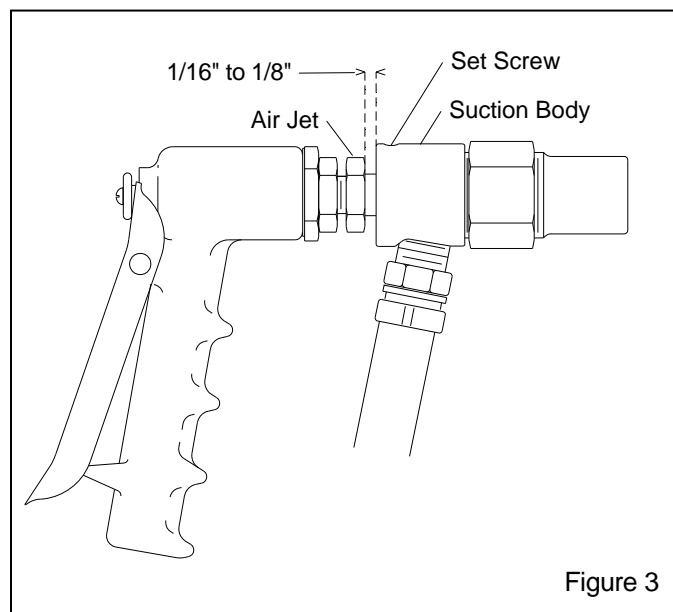


Figure 3

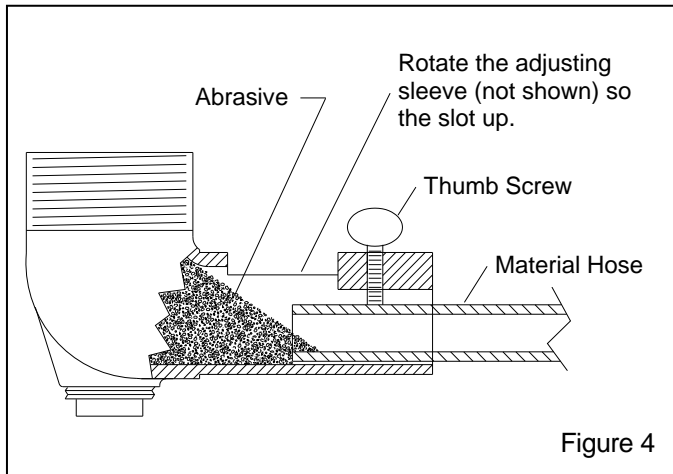
### 5.2 Abrasive/Air Mixture, Figure 4

**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.



**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

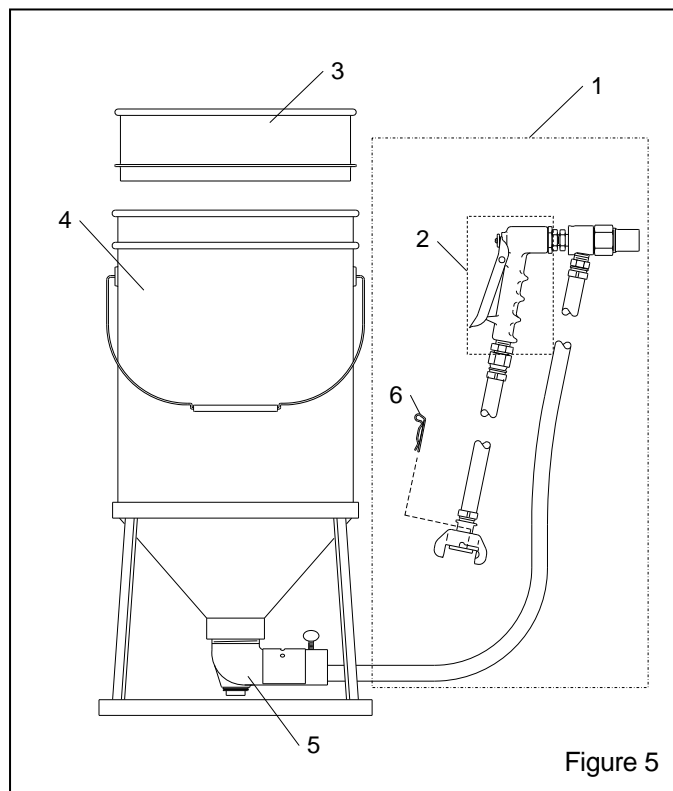
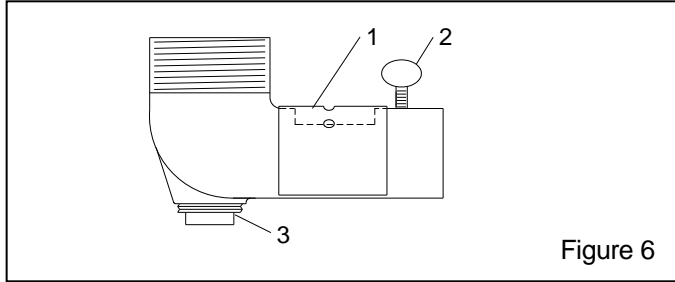


Figure 5

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



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

