Hodge Clemco Ltd

SG-300
Suction Gun

Date of issue: 24/08/92 TS.OM64A

Owner's Manual

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1.0 INTRODUCTION

1.1 General Description (Figure 1).

The SG-300 Suction Gun is designed for abrasive blast cleaning where the air supply is limited, or where low pressure is necessary to protect delicate parts or soft surfaces. The SG-300 is a suction blast system. An air hose and a material hose are connected to the suction gun body. Air moving at a high velocity through an air jet inside the body creates a partial vacuum in the material hose. As a result, abrasive is sucked from the hopper through the material hose and propelled out of the nozzle.

WARNING: THE MAXIMUM RECOMMENDED WORKING PRESSURE OF THIS EQUIPMENT IS 110 psi. UNDER NO CIRCUMSTANCES MUST IT BE CONNECTED TO AN AIR SUPPLY OF GREATER PRESSURE.

2.0 SETTING UP INSTRUCTIONS

2.1 Ensure that the knurled nozzle adapter (item 2 Figure 2) is securely hand tightened down onto the suction gun body and securely locate the selected nozzle into the nozzle adapter until fully seated.

2.2 Compressor. For most applications, the compressor should be large enough to maintain 80-90 psi under working conditions. Delicate work, however, may dictate pressures as low as 60 psi. The cfm requirement for the compressor varies with the size of the air jet. See air chart (Section 5).

2.3 Air Supply Hose. Securely connect the air supply hose to the 1/2" air hose of the SG-300. Recommended air supply hose diameters are given in the air chart (Section 5). For optimum efficiency, the air supply hose should be as short as possible and the installation of a water separator, to remove moisture, is recommended to avoid abrasive clogging.

WARNING: ESCAPING AIR IS DANGEROUS. IT IS ESSENTIAL THAT ALL AIR HOSE CONNECTIONS ARE SECURE AND THAT ANY SEALING GASKETS REQUIRED ARE IN GOOD CONDITION AND INPOSITION.

2.4 Feed Elbow. Connect the material hose to the feed elbow at the bottom of the hopper. The air/abrasive ratio can be controlled by loosening the thumb screw in the elbow and moving the hose in (more abrasive) or out (less abrasive). The proper adjustment can only be determined by experience. In general, a “lean” mixture is best, with as little abrasive as necessary to do the job.

2.5 Abrasive Loading. Place the sieve over the hopper and fill the hopper with dry abrasive. Ensure that no foreign material is allowed to enter the hopper. Any type of abrasive may be used according to the application. See chart (Section 5) for recommended mesh sizes.

NOTE: Air Jets and Nozzles. The standard suction gun is supplied with a 1/8" diameter air jet and a 5/16" diameter nozzle. Other sizes of jets and nozzles should be used in the following combinations only, and are available ex stock.

AIR JET	NOZZLE
SH-1 1/16”	CT-3L 3/16”
SH-2 1/8”	CT-5L 5/16”
SH-3 3/16”	CT-6L 3/8”
SH-4 1/4”	CT-8L 1/2”

The positioning of the air jet is pre-set to the tolerances shown in Figure 1 for maximum efficiency. Adjustment is not normally required until excessive wear has taken place on the nozzle. Should this occur, the air jet can be moved forward by loosening the set screw (see Figure 1).

3.0 OPERATING INSTRUCTIONS

WARNINGS: 1. THE OPERATION OF THIS EQUIPMENT CAN GENERATE NOISE LEVELS WHICH CAN BE DAMAGING TO THE EARS. IT IS ESSENTIAL THAT THE OPERATOR, POT TENDER AND ALL OTHER PERSONNEL IN THE VICINITY BE MADE AWARE OF THIS AND THAT SUITABLE EAR DEFENDERS ARE WORN.

ABRASIVE RICOCHET AND DUST LEVELS GENERATED FROM THE BLAST CLEANING OPERATION AN BE DANGEROUS AND ALL PERSONNEL WITHIN THE AREA MUST WEAR ADEQUATE PROTECTION.

SIGNS WARNING OF THESE DANGERS MUST BE POSITIONED AROUND THE PERIMETER OF THE BLASTING OPERATION AND MEASURES MUST BE TAKEN TO ENSURE THAT NO ONE ENTERS THE AREA OF THE BLASTING OPERATION WITHOUT PERMISSION AND WITHOUT ADEQUATE SAFETY PROTECTION EQUIPMENT. SHOULD ANYONE ENTER THE AREA, THE BLASTER MUST IMMEDIATELY CLOSE DOWN THE BLASTING OPERATION BY RELEASING THE TRIGGER, (OR BY THE SUPERVISOR TURNING OFF THE COMPRESSED AIR SUPPLY TO THE MACHINE).

NOTE: IN THE INTERESTS OF SAFETY AND EFFICIENCY, IT IS NECESSARY THAT THE BLASTER AND SUPERVISOR OPERATE SOME FORM OF SIGNALLING OR COMMUNICATION SYSTEM. UNDER OPERATING CONDITIONS WHERE THE BLASTER IS NOT IN CONSTANT VIEW OF THE SUPERVISOR,IT IS STRONGLY RECOMMENDED THAT A HELMET COMMUNICATION SYSTEM BE USED.

Having carried out the setting-up instructions contained in Part 1 and prior to loading the initial charge of abrasive into the machine:-

3.1 Turn ON the compressed air supply to the suction gun at the compressed air supply outlet valve.

3.2 Adjust the drain cock on the moisture separator to give a constant slight bleed-off of air-water vapour.

3.3 Refer to the helmet manufacturer’s instructions and turn ON the breathing air supply to the helmet.

WARNING: IT IS ESSENTIAL THAT ALL CONNECTIONS ON THE HELMET AIR HOSES ARE SECUREAND UNDER NO CIRCUMSTANCES MUST THE HELMET BE USED UNTIL THE AIR

SUPPLY HAS BEEN TURNED ON AND FOUND TO BE ENTERING THE HELMET IN THE REQUIRED VOLUME AND QUALITY.

3.4 Ensure that the breathing air supply hose is adequately protected to prevent it becoming accidentally trapped, nipped or broken.

3.5 Position danger warning signs around the area of the operation and outside the perimeter of excessive noise levels and abrasive ricochet/dust fall out.

3.6 The blasting operator must now don protective clothing, sturdy gauntlets, ear defenders and air fed helmet.

3.7 Ensure that all personnel within the vicinity are adequately protected (see WARNING above).

3.8 The operator must first check that no one has entered the marked area of the operation and then firmly take a secure hold of the suction gun, at all times directing the nozzle at the work surface.

3.9 CLOSE the trigger and compressed air and abrasive will pass through the nozzle. For adjustment of abrasive flow see 2.4.

3.10 RELEASE the trigger and the blast stream will cease to pass through the nozzle.

WARNING: A BACK THRUST IS CREATED BY THE ACTION OF COMPRESSED AIR PASSING THROUGH THE NOZZLE, THEREFORE THE OPERATOR MUST ENSURE HE HAS ADOPTED A SAFE STANCE AND POSITION AND MUST MAINTAIN FIRM HOLD OF THE BLAST GUN.

IMPORTANT NOTICE FOR SAFER AND MORE PRODUCTIVE BLAST CLEANING

1. **Use protective equipment:- abrasive-resistant clothing, safety shoes, leather gloves, ear protection, approved air-fed helmet and air filtration system.**
2. **Do not blast with damaged or worn equipment.**
3. **Point nozzle only at area being cleaned.**
4. **Use only abrasives specifically approved for blasting.**
5. **Keep unprotected workers out of the blast area.**
6. **Before blasting:**
   - **Check fittings and hose for wear. Safety-wire couplings together.**
   - **Check helmet filters and air supply.**
   - **Test controls.**
   - **Make sure blast equipment is adequately earthed.**
7. **Do not substitute for Clemco parts or modify equipment in any way.**

4.0. MAINTENANCE

All blast cleaning equipment is subject to abrasive wear, therefore for safety and efficiency, it is ESSENTIAL to operate a preventative maintenance programme. The degree of wear is variable and is dependant upon many factors:- type and grade of abrasive, air pressure, nozzle size, operator expertise etc and these factors should be taken into consideration when planning regular maintenance schedules. The following checklists are a basic guide to assist in planning maintenance programmes.

WARNING: ENSURE THAT THE COMPRESSED AIR SUPPLY TO THE EQUIPMENT IS TURNED OFF AND ALL AIR LINES ARE PURGED OF PRESSURE AND DISCONNECTED FROM THE EQUIPMENT BEFORE ANY MAINTENANCE WORK IS CARRIED OUT. PRECAUTIONS SHOULD BE TAKEN TO PREVENT ACCIDENTAL TURNING ON OF THE COMPRESSED AIR SUPPLY.

NOTE: MAINTENANCE SHOULD ONLY BE CARRIED OUT BY TRAINED, COMPETENT PERSONS.

4.1. Maintenance Check List

4.1.1. Check condition of all air hoses, connections and gaskets for sign of wear and replace as necessary.

4.1.2. Air Jet Sleeve (Figure 1). Periodically inspect the rubber air jet sleeve and replace it when worn. This will prolong the life of the jet.

4.1.3. Valve Seat (Figure 1). Periodically inspect the nylon valve seat and replace it when worn. Failure to replace this washer will cause the suction gun to leak, wasting air and reducing effective blasting power.

4.1.4. Nozzle. Replace the nozzle when its' diameter has increased by more than 1/16", or sooner if suction diminishes noticeably.

NOTE: Do not use a wrench for tightening the blast nozzle. Screw it in hand tight only.

4.1.5. Obstructions. If the material hose clogs, it can normally be cleared by the following method: Disconnect the hose at the intake end from the feed elbow. Press the nozzle outlet hard against a flat surface to block the nozzle and then squeeze the trigger. Back pressure will blow air through the suction head, forcing the obstruction out of the material hose.

WARNING. IF THE ABOVE PROCEDURE IS FOLLOWED, CARE MUST BE TAKEN IN ENSURING THAT:
(A) THE DISCONNECTED END OF THE MATERIAL HOSE IS POINTING AWAY FROM ALL PERSONNEL.
(B) THE NOZZLE SEATS FIRMLY AGAINST THE FLAT SURFACE, THE ABRASIVE THUS BEING GIVEN NO CHANCE TO ESCAPE.

4.1.6. Abrasive "clogging". If abrasive frequently clogs and jams the feed elbow, there is probably excessive moisture in the system. This may be due to a faulty compressor that pumps oil into the air line, or to an air line long enough for moisture to condense on the inside. Install a water separator. If the problem continues, it may be necessary to change the abrasive in the hopper, especially if fine mesh abrasive is used. Do not leave abrasive in the hopper overnight.

4.1.7. Poor Suction/"Blow Back". If the gun has poor suction, check for adequate air supply (paragraph 2.2. and chart 5.0.); proper air jet adjustment and nozzle wear (see NOTE after 2.5.). If abrasive blows back through the feed elbow, this is probably due to an air jet problem. The jet will be missing, worn out or too big.

5.0. Air and Abrasive Requirements

Variable	SH-1 with CT-3	SH-2 with CT-5	SH-3 with CT-6	SH-4 with CT-8
cfm required*	4 to 6	17 to 25	37 to 58	67 to 103
Required air supply hose i.d.	1/2” up to 50ft 3/4” over 50ft	1/2” up to 25ft 3/4” over 25ft	1/2” up to 25ft 3/4” over 25ft	3/4” up to 50ft 1” over 50ft
Maximum abrasive mesh size expendable	30 BSM	30 BSM	20 BSM	16 BSM
Maximum abrasive mesh size metallic	50 BSM	50 BSM	40 BSM	30 BSM
*The size of the jet, not the nozzle, determines air consumption.				

6.0 Fault Analysis

WARNING: ENSURE THAT THE AIR SUPPLY AT THE COMPRESSOR IS TURNED OFF AND THE AIRLINE IS PURGED OF PRESSURE BEFORE REPAIR WORK IS CARRIED OUT.

Symptom	Probable Fault	Action Required
6.1 No air or abrasive passes through the nozzle.	Compressor not turned on. Water separator blocked. Valve seat not releasing.	Turn on compressor. Check and clean – see Owners Manual. Check action of trigger and valve seat.
6.2 Air but no abrasive passes through the nozzle. 6.3 Intermittent flow of abrasive.	Damp abrasive or large object restricting flow at base o cone of abrasive hopper. Abrasive metering not adjusted correctly. Nozzle wear.	Clean out hopper and/or material hose – see 4.1.5. Check material hose adjustment – see 2.4. Check nozzle – see 4.1.4.
6.4 Abrasive surges from the nozzle.	Abrasive metering not adjusted correctly.	Check material hose adjustment – see 2.4.

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Fig 1

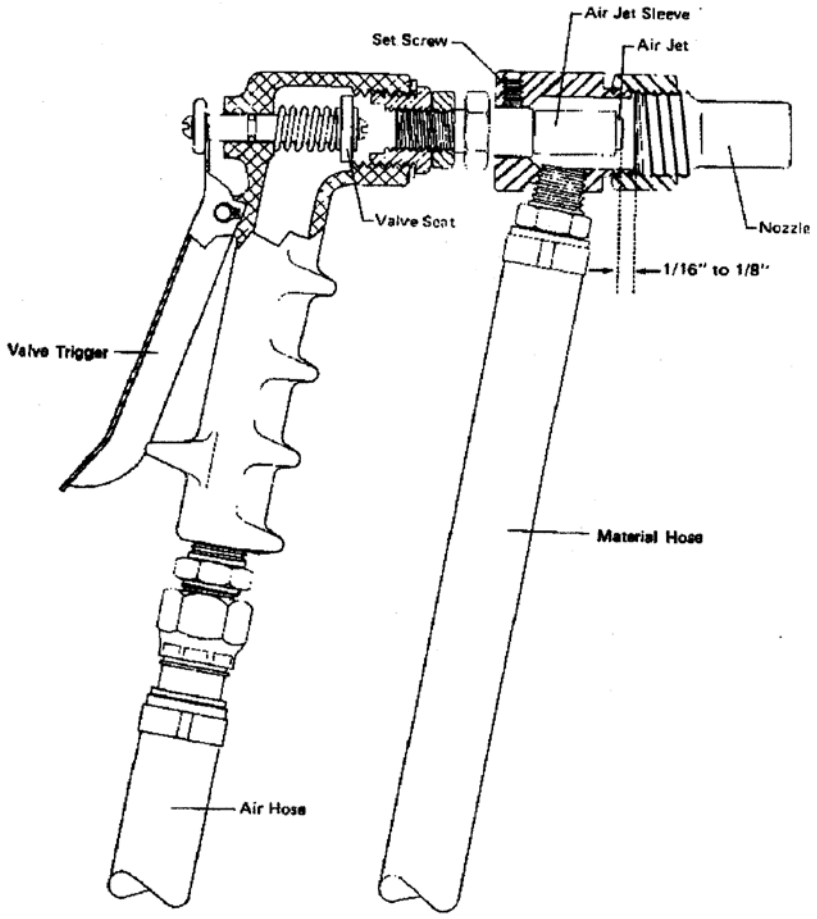
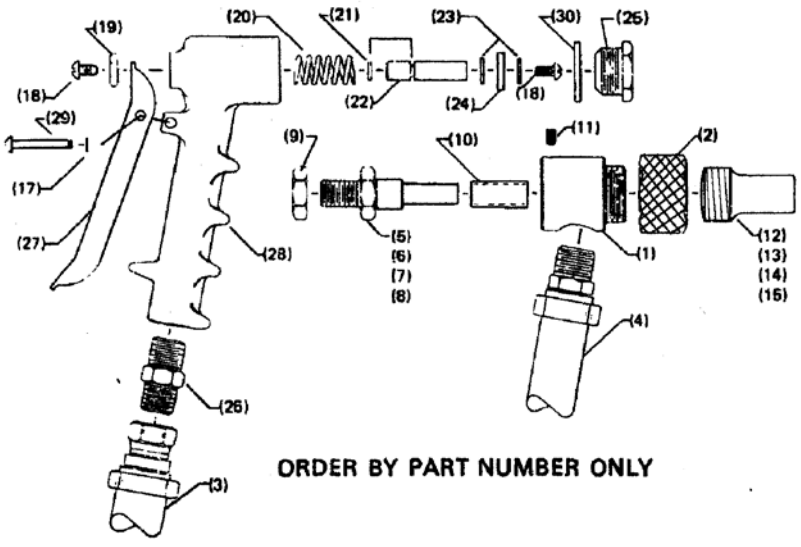


Fig 2



ORDER BY PART NUMBER ONLY

7.0 Replacement Parts

Item	Description	Part No.
(-)	Suction Gun Complete	SG-300
(-)	Suction Gun and Hose Assembly	SGLH
(-)	Hopper Screen	SHS-12
(-)	Hopper	SSH-1219
(-)	Feed Elbow	SSH-200
(1)	Suction Gun Body	SH-6
(2)	Nozzle Adaptor	SG 300 NA
(3)	Air Hose Assembly, 1/2” dia x 10” long	SH-8
(4)	Material (Abrasive) Hose Assembly, 1/2” dia x 10” Long	SH-9
(5)	Air Jet, 1/16” Orifice	SH-1
(6)	Air Jet, 1/8” Orifice	SH-2
(7)	Air Jet, 3/16” Orifice	SH-3
(8)	Air Jet, 1/4” Orifice	SH-4
(9)	Air Jet, Lock Nut	SH-10
(10)	Air Jet, Sleeve	SH-11
(11)	Set Screw, Cone Point, 1/4”	SH-12
(12)	Nozzle, 3/16”	CT-3L
(13)	Nozzle, 5/16”	CT-5L
(14)	Nozzle, 3/8”	CT-6L
(15)	Nozzle, 1/2”	CT-8L
(16)	Air Gun Assembly (includes items 17-30)	SGT
(17)	Retaining Ring	SGT-2
(18)	Round Head Screw	SGT-2
(19)	Valve Lift Washer	SGT-3
(20)	Spring	SGT-4
(21)	O-Ring	SGT-5
(22)	Valve Stem, Brass	SGT-6
(23)	Washer	SGT-7
(24)	Valve Seat Nylon	SGT-8
(25)	Valve Seat, Brass	SGT-9
(26)	Air Hose, Connector	SGT-10
(27)	Valve Trigger	SGT-11
(28)	Body	SGT-12
(29)	Trigger Hinge Pin	SGT-13
(30)	Valve Seat Gasket	SGT-14

Maintenance /Service Record

Date	Details	Signature