

**SINGLE CHAMBER BLAST MACHINE  
MODELS 1028 AND 1042  
O. M. 04124**

DATE OF ISSUE: 01/15/77  
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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 Part 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.**

© 2013 CLEMCO INDUSTRIES CORP.  
One Cable Car Dr.  
Washington, MO 63090  
Phone (636) 239-4300  
Fax (800) 726-7559  
Email: [info@clemcoindustries.com](mailto:info@clemcoindustries.com)  
[www.clemcoindustries.com](http://www.clemcoindustries.com)



**1.0 INTRODUCTION**

**1.1 Scope**

**1.1.1** These instructions include the set-up, operation, maintenance, troubleshooting, and replacement parts for Clemco Model 1028 (0.5 cu ft. capacity) and Model 1042 (1.0 cu ft. capacity) blast machines. The instructions cover remote-controlled machines (when an operator controls blasting from a pneumatically operated control handle mounted at the nozzle), and manually-controlled machines (a blast machine fitted with simple ball valves at the inlet and outlet, that must be manually opened and closed to start and stop the blast process). The following separate manuals are included with a blast machine when furnished with remote controls.

- TLR-50 Remote Controls, Manual No. .... 03358
- RLX Control Handle, Manual No. .... 10574

**1.1.2** OSHA requires remote controls on all blast machines when a blast operator commands the nozzle Ref 29 CFR 1910.244(b). Manually-controlled blast machines are allowed only where the nozzle is fixed to a supporting fixture, and separated from the operator and surrounding personnel. If this machine is intended for use with a blast operator, and it is not equipped with remotes controls, contact a Clemco distributor for a TLR-50 remote control system (Stock No. 02518).

**1.1.3** These instructions contain important safety information. All operators and personnel involved with the abrasive blast process must read and understand the contents of these instructions, including the orange cover. It is equally important that the operator is trained and qualified to safely operate the blast machine and remote controls, and all other equipment used with the blast machine.

**1.1.4** 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, and contains important safety information about abrasive blasting that may not be included in equipment operation manuals. To order additional copies, visit [www.clemcoindustries.com](http://www.clemcoindustries.com) or email [info@clemcoindustries.com](mailto:info@clemcoindustries.com).

**1.2 Safety Alerts**

**1.2.1** Clemco uses safety alert signal words, based on ANSI Z535.4-1998, 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 indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**



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



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

**1.3 Description**

**1.3.1** The primary components of the blast machine are shown in Figure 1.

**1.3.2** Clemco blast machines (pressure vessels) are manufactured to American Society of Mechanical Engineers (ASME) standards, as described in Section VII, Div. 1, and carry National Board certification. It is the owner's responsibility to maintain the integrity of the vessel. In some states this may include regular inspection and hydrostatic testing as described in National Board Inspection Code and jurisdictional regulations and /or laws.

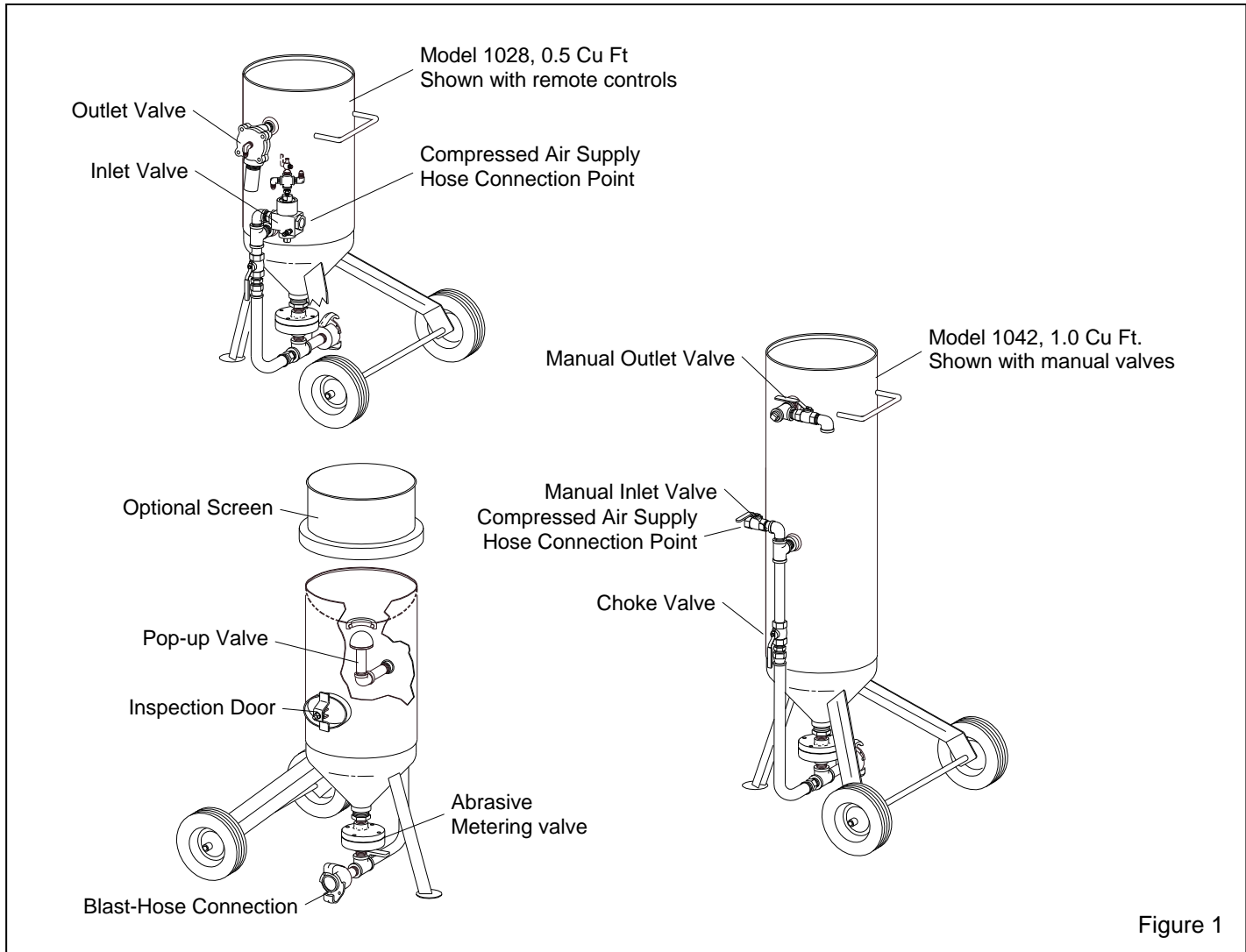


Figure 1

**⚠ WARNING**

**Welding, grinding, or drilling on the blast machine could weaken the vessel. Compressed air pressure could cause a weakened blast machine to rupture, resulting in death or serious injury. Welding, grinding, or drilling on the blast machine vessel, without a National Board R stamp voids the ASME and National Board certification.**

**1.3.3** All welding repairs done on the vessel must be performed by certified welders, at shops holding a National Board R Stamp. Welding performed by any welder not properly qualified per the ASME Code voids ASME and National Board certification of the vessel.

**1.3.4** This blast machine is rated for a maximum working pressure of 125 psi (pounds per square inch); do not exceed the rated pressure.

**⚠ WARNING**

**Excessive compressed air pressure could cause a blast machine to rupture. To prevent serious injury or death, do not exceed the rated pressure of the blast machine.**

**1.3.5** OSHA does not require pressure relief valves on blast machines when air compressors supplying air to the blast machines are built to ASME<sup>(1)</sup> specifications and comply with OSHA<sup>(2)</sup> regulations. ASME Manual section VIII, Division 1, UG-125, paragraph A90 (g) states that pressure relief valves or protective devices "...need not be installed directly on a pressure vessel when the source of pressure is external to the vessel

Compressed Air and Abrasives Consumption							
Consumption rates are based on abrasives that weigh 100 pounds per cubic foot							
Nozzle Orifice Size (inch)	Pressure at the Nozzle (psi)						Air, Power and Abrasive Requirements
	50	60	70	80	90	100	
No. 2 (1/8 inch)	11	13	15	17	19	20	Air (cfm)
	67	77	88	101	112	123	Abrasive (lbs/hr)
	2.5	3	3.5	4	4.5	5	Compressor (hp)
No. 3 (3/16 inch)	26	30	33	38	41	45	Air (cfm)
	150	171	196	216	238	264	Abrasive (lbs/hr)
	6	7	8	9	10	10	Compressor (hp)
No. 4 (1/4 inch)	47	54	61	68	74	81	Air (cfm)
	268	312	354	408	448	494	Abrasive (lbs/hr)
	11	12	14	16	17	18	Compressor (hp)

- Air requirements were measured by a flow meter under actual blasting conditions, and are therefore lower than figures for air alone, with no abrasive.
- Horsepower requirements are based on 4.5 cfm per horsepower.
- Figures are for reference only, and may vary for different working conditions. Several variables, including metering valve adjustments, can affect abrasive flow.
- Figures show approximate compressed air and abrasive consumption when nozzles are new. Consumption will increase as the nozzle wears.

Figure 2

**and is under such positive control that the pressure in the vessel cannot exceed the maximum allowable working pressure at the operating temperature...".** OSHA regulation 1910.169 refers to the above ASME code when describing 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.

<sup>(1)</sup> American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, 1989

<sup>(2)</sup> Occupational Safety and Health Administration, 29 CFR 1910, Subpart M - Compressed Gas and Compressed Air Equipment.

**1.3.6 Compressed-air Requirements**

**1.3.6.1** The size of the compressor required depends on the orifice size of the nozzle and blasting pressure. Unless otherwise specified, blast machine packages are supplied with a 1/4" orifice nozzle. Nozzles larger than 1/4" are not recommended because they will rapidly wear the 1/2" blast hose used with these machines.

**1.3.6.2** Refer to the table in Figure 2 to determine cfm requirements. The table shows air consumption of nozzles when new. It does not show the recommended

compressor size. As nozzles wear, they will consume 70% to 80% more air. Consult with a compressor supplier for suggested compressor size based on the air consumption of the next larger orifice size.

**1.3.7 Remote Controls**

**1.3.7.1** Separate manuals are provided for the operation, maintenance, and replacement parts for the TLR-50 remote controls (Manual Stock No. 03358) and RLX control handle (Manuals Stock No. 10574). Refer to those manuals for set-up and operation of the remote control system.

**1.3.8 Air Filter, Optional**

**1.3.8.1** The optional air filter at the blast machine inlet removes water condensed in the compressed air line. Its use is especially important in areas of high humidity, or when fine-mesh abrasive is used. Moisture causes media to clot and inhibits free flow through the metering valve. See Section 7.1 for accessories. If moisture problems persist, an air dryer may be required.

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## 1.4 Abrasive

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### 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 OSHA recommends, do not use abrasives containing more than trace amounts (more than one percent) free silica.**

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**1.4.1** Selection of blasting abrasive can play a significant part in the health risk, productivity, and maintenance of the blast machine. DO NOT USE abrasives containing more than one percent crystalline (free) silica. Obtain material safety data sheets (MSDS) for the blasting abrasive prior to blasting, paying particular attention the health risks and presence of any hazardous/toxic substances. Use only abrasives specifically manufactured for blast cleaning, and that are compatible with the surface being blasted. Abrasive produced for other applications may be inconsistent in size and shape, and contain particles that could jam the abrasive metering valve, or cause irregular wear.

**1.4.2 Abrasive Size:** The choice of abrasive size depends on the desired profile, cleaning rate, nozzle size and availability of clean dry air. Generally, larger and denser abrasive provide a deeper profile, while smaller abrasives clean faster. Most abrasive blasting is done with abrasive between 20 and 80 mesh. Larger sizes may be used if the nozzle orifice is large enough to prevent particles to pass without jamming. Finer abrasive is especially sensitive to moisture and requires very dry air to prevent bridging in the metering valve.

**1.4.3 Sand:** Sand should never be used because of the respiratory hazards associated with abrasive containing free silica.

**1.4.4 Slags:** Slag abrasives are compatible with the blast machine and accessories. Obtain a material safety data sheets (MSDS).

**1.4.5 Steel:** The abrasive metering valve used with the 0.5 cu. ft. and 1.0 cu ft blast machines are generally not suitable for use with steel or iron abrasive. Steel may wedge between the narrow gap between the pop-up valve and pop-up guide and cause the pop-up valve to stick.

**1.4.6 Silicon Carbide, Aluminum Oxide, and Garnet:** These are the most aggressive, high-volume abrasives in the blasting industry. Aggressive abrasive such as these may be used, but the service life will be reduced on any equipment components which come in contact with the abrasive. Use a nozzle lined with boron carbide with these abrasives.

**1.4.7 Glass Bead:** Most beads are treated to ensure free-flow operation even under moderately high-humidity. Glass beads subjected to excessive moisture may be reused after thorough drying and breaking up any lumps. Clean dry air is a necessity. Minor surging will be noted at startup when using glass bead.

**1.4.8 Lightweight Abrasive:** Plastic media and most agricultural media may be occasionally used in a standard blast machine. Exclusive use of plastic, and some lightweight media, requires a blast machine with a 60° conical bottom to maintain continuous media flow.

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## 2.0 INITIAL SET-UP

### 2.1 Blast Machine Set-Up

**2.1.2** Install an air supply hose fitting to the inlet valve (or filter), that is compatible with the compressed-air supply hose. See Section 3.2.2.

### 2.2 Remote Control Set-Up

**2.2.1** Refer to the remote control manual for set-up and operation of the control system.

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## 3.0 OPERATION

### 3.1 Transporting and moving

#### 3.1.1 Transporting a blast machine

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### WARNING

- Always empty the blast machine before lifting or hoisting.
  - Never hoist the machine by the handle or piping, or with a sling through the handle or piping.
  - When transporting a machine on a pallet, always securely attach the machine to a sturdy pallet.
  - Always securely anchor the machine to the transport vehicle.
  - Failure to observe these warnings could result in serious injury or death.
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**3.1.1.1** Always empty the machine before transporting. Transporting a machine containing abrasive may increase the weight to an unsafe handling limit, and could cause abrasive to settle in the piping.

3.1.2 Moving a blast machine

 **WARNING**

**Never manually move a blast machine when it contains abrasive. Empty (model 1028 and 1042) machines may be moved when the following criteria are met.**

3.1.2.1 An empty machine may be moved manually on level flat surfaces.

3.1.2.2 Move the machine by pushing it in a forward direction. Do not back-up while moving the machine, as potential tripping hazards cannot be seen.

3.2 Set-up

3.2.1 Locate the compressor upwind and/or away from the blasting operation to prevent contaminated air from entering the compressor intake.

3.2.2 Connect a 3/4" ID or larger air line from the compressor to the air supply hose connector previously installed on the blast machine inlet.

NOTE: If the air line supplies air to other pneumatic tools, install isolation valves to enable depressurization of each line for service.

 **WARNING**

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

3.2.3 Make sure the coupling gaskets are in place and in good condition before connecting the blast hose to the quick coupling on the blast machine. To prevent accidental separation during blasting, use safety lock-pins or safety wire to lock the couplings together.

3.2.4 Make sure that all hose connections are secure. Install safety lock pins on all quick couplings. Use lock pins and safety cables at all quick coupling connections to help prevent accidental separation of hoses. Lock pins and safety cables are listed in Section 7.3.

 **WARNING**

**Hose disconnection while under pressure could cause serious injury or death. Use safety lock-pins and safety cables on all coupling connections to help prevent hose couplings from accidental disconnection.**

3.2.5 Make sure the choke valve is open (handle in-line with the piping).

3.2.6 Close the abrasive metering valve. The closed position is when the handle is pointing toward the pipe nipples in the metering valve.

3.2.7 Close the air valve on the compressor. Start the compressor, and bring it up to operating temperature and pressure. The pressure must not exceed 125 psi.

3.2.8 Load abrasive into the machine by following the instructions in Section 3.6.

3.2.9 If the machine is equipped with manual valves, make sure the inlet valve is closed (handle perpendicular to the valve).

3.2.10 If the machine is equipped with remote controls, make sure the control handle is in the "up" (no blast) position.

3.2.11 Slowly open the compressor air valve to pressurize the air supply line. Listen for noise that indicates any open lines or leaks.

3.2.12 Do not allow anyone around the blast machine except machine tenders, who are appropriately fitted with approved personal protective equipment.

 **WARNING**

**Everyone except for the blast operator or blast machine tender must stay clear of the blast machine. The machine tender or blast operator may pressurize or depressurize the machine at any time, which could cause abrasive to vent under pressure, causing dust and toxins to become airborne. Noise is produced by the sudden release of compressed air when the machine is pressurized or depressurized. These conditions could cause injury. Both the operator and machine tender must wear suitable personal protective equipment including an approved respirator, plus approved eye, face, and hearing protection.**

**3.3 Manual Blasting.** Refer to Section 3.4 for blasting with remote controls.

**3.3.1** Make sure the ventilation system is running.

**3.3.2** Make sure the nozzle fixture is secure and that the nozzle is directed only toward objects intended to be blast cleaned.

**⚠ WARNING**

**OSHA requires remote controls on all blast machines when an operator controls the nozzle. Ignoring this warning places the operator at risk of severe injury or death from accidents that could occur from an uncontrolled blast nozzle.**

**3.3.3** Make sure the blasting area is contained.

**⚠ WARNING**

**Abrasive blasting produces harmful dust. Everyone exposed to blasting dust must wear a properly-fitted and properly-maintained NIOSH-approved, respiratory protection appropriate for the job site hazards. Loud noise generated by the use of compressed air could cause hearing damage. Everyone exposed to the noise must wear approved hearing protection.**

**3.3.4** The machine tender closes the outlet valve, and while standing back and facing away from the concave filling head, opens the inlet valve. This action causes the pop-up valve to seal off the filling port and pressurizes the blast machine.

**3.3.5** If the abrasive metering valve is closed as instructed in Section 3.2.6, only air will exit the nozzle. Adjust the metering valve per Section 3.5.

**⚠ WARNING**

**Never leave a pressurized machine unattended. If an emergency occurs, such as a burst blast hose, shut-down the machine immediately.**

**3.3.6** To stop blasting, the machine tender closes the inlet valve, and while standing back and facing away from the concave head and outlet valve, quickly opens the outlet valve. The pop-up valve drops when air is expelled from the machine and pressure equalizes.

**3.4 Blasting with Remote Controls.** Refer to Section 3.3 for manually-controlled blasting.

**3.4.1** Refer to the remote control manual to ensure the machine is correctly set-up and ready for blasting.

**3.4.2 Blasting Attire**

**3.4.2.1** 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.

**⚠ WARNING**

**Before blasting, test the coating and substrate for toxic materials (such as lead or other heavy metals, or asbestos). These hazards require special measures to protect the operators and the environment.**

**No dust is safe to breathe. Abrasive blasting produces harmful dust. Failure to wear approved respirators could result in serious lung disease or death. Blast operators must wear properly-fitted and maintained NIOSH-approved, type-CE supplied-air respirators approved for abrasive blasting.**

**During abrasive blasting, abrasive particles and dust in the area around the blast machine and blast nozzle become airborne. Everyone working in the vicinity of abrasive blasting must wear properly-maintained, NIOSH-approved, respiratory protection and eye protection appropriate for the job site hazards.**

**Loud noise generated by the use of compressed air could cause hearing damage. Everyone in the blasting area must wear approved hearing protection.**

**3.4.3** Close the safety petcock located on the inlet valve. Air should now be heard escaping from the orifice under the control handle lever, but from no other place.

**3.4.4** Pull back the safety lever lock under the control handle lever.

**3.4.5** Point the nozzle only toward objects intended to be blast cleaned.

**3.4.6** While holding the lever lock down, press the control handle lever. Be prepared; blasting will begin as soon as the machine pressurizes.

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## **WARNING**

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**OSHA requires remote controls on all blast machines when an operator controls the nozzle. Do not tie down the control handle or attempt to bypass any part of the remote control system. Doing so will defeat the purpose of the fail-to-safe feature of the remote control. Severe injury or death can result from uncontrolled blasting.**

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**3.4.7** If the abrasive metering valve is closed as instructed, in Section 3.2.6, only air will exit the nozzle. Adjust the metering valve per Section 3.5.

**3.4.8** To stop blasting, release the control handle lever. The safety lever lock automatically pops up to prevent accidental activation of the blast machine.

**3.4.9** Open the safety petcock. Always open the safety petcock during work breaks to prevent unintentional blasting.

### **3.5 Adjust Abrasive Metering Valve**

**3.5.1** Abrasive flow is adjusted with the metering handle. Begin adjustments with the metering valve closed. Closed is when the handle is turned fully clockwise when viewed from the top.

**3.5.2** Increase abrasive flow by moving the handle counterclockwise, at 1/8" or increments or less, allowing time for the flow to stabilize before readjusting.

**3.5.3** Optimum abrasive flow depends on the type and size of abrasive and blast pressure, and can best be determined by experience. Use as little abrasive as possible while maintaining the maximum cleaning rate. The air/abrasive mixture should be mainly air. The abrasive exiting the nozzle should barely discolor the air when seen against a contrasting background.

### **3.6 Loading Abrasive into the Blast Machine**

**3.6.1** Depressurize the machine using procedures for manual blasting per Section 3.3, or blasting with remote controls per Section 3.4.

**3.6.2** Load abrasive into the machine by pouring it into the concave head. Using an optional screen, placed over the head, prevents large objects from falling inside. A screen is recommended to keep objects such as pieces of abrasive bags and rocks from falling into the machine. Foreign objects will jam the machine. Abrasive flows through the filling port into the machine. Keep the abrasive level below the pop-up valve to prevent abrasive on the pop-up valve from being forced up and

out of the top of the machine when the machine is pressurized.

**3.6.3** After the machine is filled, use procedures for manual blasting per Section 3.3, or blasting with remote controls per Section 3.4, to begin blasting.

### **3.7 Emptying the Machine of Abrasive**

**3.7.1** When working in environments subject to extreme temperature changes, or very humid conditions, condensation may develop inside the machine. Condensation wets abrasive and causes flow problems. To prevent this, empty the machine of all abrasive when shutting down for the day. This will eliminate trouble from moist abrasive when starting a new day's blasting. One way to avoid having to empty the machine is to load only as much abrasive as will be used during the work period. If the machine must be purged of abrasive, do the following:

**3.7.2** With the blast machine off, turn the blast pressure to approximately 40-50 psi, close the choke valve, and set the abrasive metering valve at full open.

**3.7.3** Purging the machine without a nozzle, will eventually erode the thread area of the nozzle holder, which could cause a hazardous condition. To prevent wear of the nozzle holder threads, the nozzle should be firmly attached to the nozzle holder. Removal of the nozzle is not recommended. If circumstances require the nozzle to be removed, also remove the nozzle washer.

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## **WARNING**

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**The threads on the nozzle and nozzle holder must be inspected each time the nozzle is secured to the holder. A loose fitting nozzle may eject under pressure and could cause severe injury. Check the threads for wear, and make sure the nozzle holder securely holds the nozzle. The nozzle washer must also be inspected for wear. When nozzle washers are worn, abrasive could erode nozzle threads.**

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**3.7.4** Point the nozzle (or hose end) into a drum or suitable container, or in the direction of the abrasive disposal location.

**3.7.5** Ensure that the hose is secure, and pressurize the machine.

**3.7.6** Depressurize the machine when empty, and open the choke valve.



**3.7.7** If the nozzle was removed, thoroughly inspect the nozzle holder threads for wear before installing the nozzle washer and attaching the nozzle.

**3.8 Shutdown**

**3.8.1** When finished blasting, and after cleanup is completed, remove the respirator outside the respirator-use area and where the air is safe to breathe.

**3.8.2** Depressurize the blast machine.

**3.8.3** Close the compressed-air supply valve at the compressor.

**3.8.4** Drain receiver tank, filters, and water collecting devices, and bleed the compressed-air supply hose.

**3.8.5** Shutdown the compressor.

**3.8.6** Cover the machine when not in use. Refer to Section 7.1 for optional covers.

**4.0 PREVENTIVE MAINTENANCE**

NOTE: These preventive maintenance instructions pertain to the blast machine. Read the owners manuals for all blast accessories, for their inspection and maintenance schedules.

**4.1 Daily Inspection**

**4.1.1** With the air off, before blasting, inspect the following:

- Make sure that couplings are secure and lock pins and safety cables are in place.
- For machines with manual controls, make sure the nozzle supporting fixture is secure.

**4.1.2** During blasting, inspect the following:

- Inspect all couplings and coupling gaskets for leaks.
- Check the blast machine for leaks. If leaks are found around the pop-up valve, inspection door, or pipe fittings at the bottom of the cone, stop blasting immediately and repair or replace worn parts.

**CAUTION**

**If leaks are allowed to continue, abrasive erosion could cause extensive or irreparable damage to the blast machine.**

- Check all external piping, control hoses, and valves for leaks. If leaks are found, stop blasting and repair.

- Inspect blast hose, couplings, and nozzle holders for leaks. At the first sign of a leak, stop blasting and inspect all items for wear. Replace worn parts.

**⚠ WARNING**

**Leaks around couplings and nozzle holders indicate worn or loose-fitting parts. Nozzle holders and couplings that do not fit tightly on hose, and nozzles that do not fit tightly in nozzle holders could disconnect while under pressure. Impact from nozzles, couplings, hoses, or abrasive, and parts disconnected while under pressure could cause severe injury.**

**4.2 Weekly Inspection**

**4.2.1** With the air off, before blasting, inspect the following:

- Inspect the blast hose for wear; squeeze the hose every three to four feet, look for soft spots. Soft spots mean the hose is worn. Replace the blast hose before the tube wears as far as the fabric plies.

**⚠ WARNING**

**Worn blast hose could suddenly burst. Couplings and nozzle holders may not adequately grip worn hose, causing them to blow off under pressure. Compressed air and abrasive escaping from a burst hose, or disconnected coupling or nozzle holder, could cause severe injury.**

- Remove the nozzle for inspection. Replace if the diameter is worn 1/16" or more, or if the liner is cracked.
- Make sure the nozzle washer is in place and not worn.

**⚠ WARNING**

**The threads on the nozzle and nozzle holder must be inspected each time the nozzle is secured to the holder. A loose fitting nozzle may eject under pressure and could cause severe injury. Check the threads for wear, and make sure the nozzle holder securely holds the nozzle. The nozzle washer must also be inspected for wear. When nozzle washers are worn, abrasive could erode nozzle threads.**

- When an optional air filter is used, inspect the filter element, and clean the bowl.

**4.3 Monthly Inspection**

**4.3.1** With the air off, before blasting, inspect the following:

- Check the pop-up valve's urethane coating for cracks and grooves. Replace the pop-up valve at the first sign of wear. See Section 5.3.
- Inspect the rubber pop-up seal, and replace at the first sign of wear, drying, or cracking. See Section 5.4.

**5.0 SERVICE MAINTENANCE**

** WARNING**

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

- **Depressurize the blast machine.**
- **Lockout and tagout the compressed air supply.**
- **Bleed the air supply line to the blast machine.**

**5.1 Removing damp abrasive from the blast machine.**

**5.1.1** To clear a minor blockage caused from damp abrasive, during operation, rapidly open and close the choke valve several times.

**5.1.2** For more difficult blockages, proceed as follows: See Section 5.2 to check for obstructions in the metering valve.

**5.1.3** With the blast machine depressurized, disconnect the blast hose and remove the gasket from the quick coupling on the machine.

**5.1.4** Place the machine so that the outlet is pointed away from any objects or persons.

** WARNING**

**Place the machine so that the outlet is pointed away from any objects or persons. Stand clear of the path of exiting abrasive. It may come out at high velocity. Impact from exiting abrasive could cause severe injury.**

**5.1.5** Close the choke valve and fully open the abrasive metering valve. Pressurize the machine to force out any damp abrasive.

**5.1.6** When the obstruction has been cleared, depressurize the machine. Remove the nozzle and nozzle washer, and reconnect the hose. Open the choke valve and close the abrasive metering valve. Pressurize the machine to clear the hose. When the hose is cleared, depressurize the machine so the nozzle and nozzle washer can be attached.

** WARNING**

**The threads on the nozzle and nozzle holder must be inspected each time the nozzle is secured to the holder. A loose fitting nozzle may eject under pressure and could cause severe injury. Check the threads for wear, and make sure the nozzle holder securely holds the nozzle. The nozzle washer must also be inspected for wear. When nozzle washers are worn, abrasive could erode nozzle threads.**

**5.1.7** With the hose cleared, start the machine using procedures for manual blasting per Section 3.3, or blasting with remote controls per Section 3.4.

**5.2 Clearing obstructions in the abrasive metering valve and blast machine.**

**5.2.1** If the nature of the obstruction permits emptying the machine of abrasive, follow the instructions per Section 3.7.

**5.2.2** Turn off the compressed air supply. Lockout and tagout the air supply, and bleed the air supply line to the blast machine.

**5.2.3** Remove the inspection plate and check the inside of the machine for obstructions from foreign objects.

**5.2.4** Check the inside of the machine for signs of moisture. If moisture is present, condensation is in the compressed air, and must be eliminated.

**5.2.5** Make sure the inspection door gasket is in good condition and that it is correctly in place before bolting the door onto the machine.

**5.2.6** Check to make sure all inspection door and hoses are secure before starting the compressed air supply.

**5.3. Replacing the Pop-Up Valve, Figure 3**

**5.3.1** All service on the pop-up valve must be done with the compressed air off and the air supply locked-out and tagged-out.

**5.3.2** To gain access to the pop-up valve, remove the inspection door assembly.

**5.3.3** Using a small pipe wrench, unscrew the pop-up valve guide by turning it counterclockwise. Remove the pop-up valve and guide from the machine.

**5.3.4** While the pop-up valve is out, check alignment. A misaligned pop-up valve could result in early valve failure, or abrasive leakage when the machine is pressurized or depressurized.

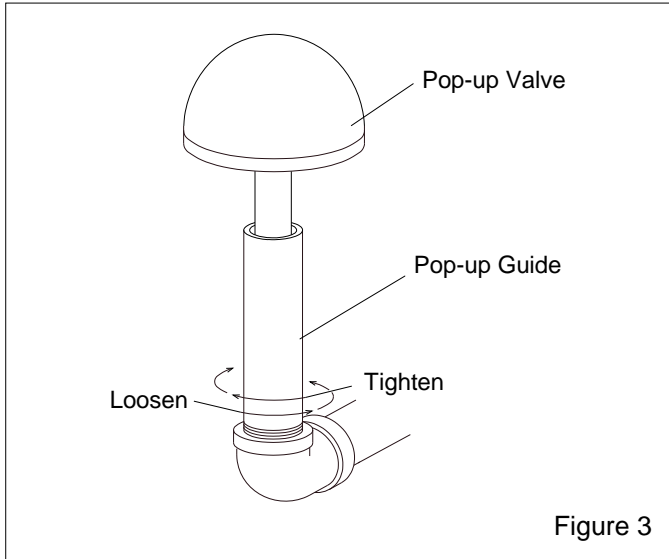


Figure 3

**5.3.5** Slide the new pop-up valve into the guide, and then screw the valve guide (with the pop-up valve in it) into position inside the machine. Tighten the guide until wrench-snug, but not wrench-tight. Over-tightening the guide will make it difficult to remove the next time the pop-up valve needs replacement.

**5.3.6** Put a new gasket on the inspection door assembly before bolting the door onto the machine.

**5.4 Replacing the Pop-Up Seal**

**5.4.1** All service on the blast machine must be done with the compressed air off and the air supply locked-out and tagged-out.

**5.4.2** If unable to change the seal using the following methods, or if the seal falls inside the machine, remove the inspection door and work from inside the machine.

**5.4.3** Remove the old seal using fingers, screwdriver, or similar object, to work the seal out of the retaining groove.

**5.4.4** Push the new seal all the way through the port and then fit it into the retaining groove. For the last few inches, pull up on the seal and allow it to pop into position.

**6.0 TROUBLESHOOTING**

**NOTE:** This section only identifies conditions and problems in the blast machine. Always refer to the appropriate section of this manual, or manuals for the remote controls or other accessory equipment, before servicing the equipment.

**⚠ WARNING**

**To avoid serious injury when troubleshooting the machine, turn off the compressed air, and lockout and tagout the air supply.**

**6.1 Neither abrasive nor air comes out of the nozzle while the machine is under pressure**

**6.1.1** Depressurize the blast machine. After the pop-up valve has dropped, remove the nozzle, and check for obstruction.

**6.1.2** Make sure that both the abrasive metering valve and choke valve are open.

**6.2 Air only (no abrasive) comes out the nozzle**

**6.2.1** Abrasive metering valve may be closed or needs adjustment. Adjust the metering valve per Section 3.5.

**6.2.2** Blast machine may be empty.

**6.2.3** Abrasive may be damp. Refer to Section 5.1 to clear damp abrasive.

**6.2.4** There may be an obstruction in the machine. Check for obstructions per Section 5.2.

**6.3 Heavy abrasive flow**

**6.3.1** Make sure the choke valve is open. The valve is open when the handle is in-line with the piping.

**6.3.2** Abrasive metering valve may be open too far. See Section 3.5.

**6.4 Abrasive surging**

**6.4.1** A certain amount of abrasive surge is normal at start-up. Should the flow of abrasive continue to surge, reduce the amount of abrasive in the air stream by adjusting the metering valve. See Section 3.5.

**6.4.2** Rapidly depressurize the machine. Slow depressurization will load the blast hose with abrasive, and cause surging at start-up.

**6.5 Intermittent abrasive flow**

**6.5.1** Moisture in the blast machine or in the air supply. Drain moisture from the compressor's receiver tank, and if so equipped, the blast machine's air filter. If moisture continues to be a problem, a dryer or aftercooler may be required in the air supply line.

**6.5.2** Abrasive may be worn from recycling. Replace abrasive.

**6.6 Blast machine will not pressurize**

**6.6.1** Make sure the compressor is "on" and all air supply valves to the machine are open.

**6.6.2** Insufficient-size air supply hose or reduced-size fittings between the compressor and blast machine. See Section 3.2.2.

**6.6.3** Dirty filter element in air filter. Check filter element.

**6.6.4** Pop-up valve stuck, or internal piping worn or out of alignment. Inspect internal piping.

**7.0 REPLACEMENT PARTS**

**7.1 Accessories, not shown**

Description	Stock No.
Remote control system, TLR-50 .....	02518
Filter, 1/2" NPT with manual drain .....	01308
Regulator, 1/2" pressure .....	01902
Cover, blast machine, poly .....	15097
Cover, 10" diameter, steel .....	03107
Screen, 10" diameter .....	03362
Blast hose, 1/2" ID x 25 ft. 2-braid	
without couplings .....	23750
coupled with 00577 and 00599 .....	01268
Holder, nozzle, CHE-1/2 .....	00577

Coupling, CQA-1/2 quick .....	00599
Gaskets, CQG, for 00559, pack of 10 .....	00850
Nozzle, tungsten lined, 3/4" NPT x 1-3/4" long	
CT-2, 1/8" orifice .....	01351
CT-3, 3/16" orifice .....	01352
CT-4, 1/4" orifice .....	01353
Nozzle, boron lined, 3/4" NPT x 1-3/4" long	
CTB-2, 1/8" orifice .....	21090
CTB-3, 3/16" orifice .....	21091
CTB-4, 1/4" orifice .....	21092
Washers, NW-1 for CT & CTB nozzle, pack of 10	21580

**7.2 Abrasive Metering Valve, 1/2-In. NPT  
Figure 4**

Item	Description	Stock No.
(-)	Metering valve assembly, Model MSV .....	01247
1.	Upper valve body .....	01258
2.	Gasket, valve body .....	01260
3.	Metering plate and stem .....	01261
4.	O-ring, .....	00794
5.	Pin, handle .....	01263
6.	Washer, nylon .....	01266
7.	Lower valve body .....	01259
8.	Spring .....	02178
9.	Handle, metering .....	01262
10.	Cap screw, 5/16-NC x 1-3/4" ....	Purchase locally
11.	Nut, 5/16-NC hex .....	Purchase locally

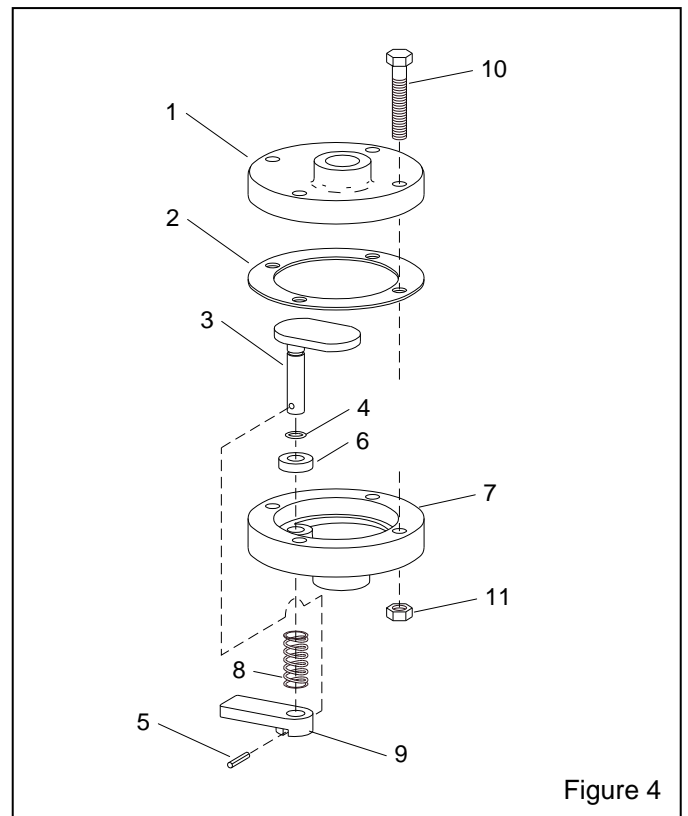


Figure 4

**7.3 Blast Machines, Replacement Parts and Accessories, Figure 5**

Item	Description	Stock No.
(-)	Model 1028, 0.5 cu. ft. capacity blast Machine without remote controls .....	21050
	with TLR-50 remote controls .....	21051
(-)	Model 1042, 1.0 cu. ft. capacity blast Machine without remote controls .....	21052
	with TLR-50 remote controls .....	21053
1.	Seal, pop-up, rubber .....	01245
2.	Pop-up valve and shaft .....	01242
3.	Handle, 1/2" ball valve .....	01252
4.	Valve, 1/2" NPT ball w/ handle .....	01241
5.	Wheel, 6" diameter, rubber tire .....	02326
6.	Metering valve, abrasive .....	01247
7.	Coupling, CFA-1/2, 1/2" NPT alum. ....	00558

8.	Gasket, inspection door, 3" x 4" .....	01249
9.	Inspection door assembly, 3" x 4" .....	01267
10.	Gaskets, CQG, for 00558, pack of 10 .....	00850
11.*	Pusher line assembly, flexible	
	11" nominal for model 1028 .....	24621
	19" nominal for model 1042 .....	24622
12.*	Adaptor, 1/2" NPT x 3/4 JIC .....	25084
13.	Axle .....	02404
14.	Washer, 3/4" thrust .....	03804
15.	Retaining ring .....	03805
16.	Screen, 10" dia. ....	03362
17.	Cover, 10" dia. ....	03107
18.	Lock pin, coupling, package of 25 .....	11203
19.	Safety cable, 1/2" to 1-1/4" OD hose .....	15012

\* Flexible pusher lines are supplied on factory machines as of October 1, 2011. Hard, formed-pipe pusher lines are no longer available.

