BLASTLINE

Operations Manual

Jumbo Blaster

Model No: BL-2500ST

BL-2500ST

Manufacturer: **Jolly Industries**
Certificate No: **2353425**

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This manual supports the following models:

BL-2500ST - 2500 Ltr

DISCLAIMER

Our company is not responsible for any death, injury, loss of materials due to any reason of misuse, inadequate skill, mishandling etc. Our responsibility ends when the material leaves our warehouse.

WARNING

Before using this product, read all instructions, literature, labels, specifications and warnings sent with and affixed to the equipment. Do not paint over, alter or deface the equipment instruction tags, stickers, or plates. Immediately replace all stickers, tags, and plates which become illegible. If the equipment user, or any assistants of the user cannot read or thoroughly understand the warnings and information contained in these instructions, it is the responsibility of the user's employer to educate, train, and test them on the proper operation and safety procedures of this equipment.

Periodic inspections at the work site should be made by supervisory personnel to ensure the equipment is being properly used and maintained in a safe working environment. A copy of this safety manual must be kept with the equipment, and must be readily accessible to equipment users, user assistants, and supervisors. Failure to comply with all instructions can result in severe bodily injury or impairment, illness, or death.

Customer Name	
PO No.	
Date of Purchase	
Machine Model	**BL-2500ST** ◯
Serial No.	

Scope of manual

This manual covers the operation and maintenance of the bulk blaster Jumbo Blaster 2500 Ltr, incorporating the following features:

- During blast operation the tank (volume >500 litre) is not pressurized or depressurized. It is permanently under pressure.
- Air for blasting is controlled by Remote Control Valves
- Abrasive metering through pneumatically controlled Thompson valve
- The blast machine is either portable (chassis) or stationary (runner or module C).

Additionally the following owner's manuals and regulations should be considered:

- Owner´s manual for pneumatic Remote Control Valves and Thompson valve.

Warnings and Cautions

This warning alert symbol is used to alert the operator of this equipment of potential harm and injury hazards. Pay special attention to these safety messages that follow this symbol to avoid potential personal injury or death. Following the instructions provided in this manual and taking the necessary accident prevention measures will greatly lower the risk of injury. Below are the two hazard levels that are used in this manual.

CAUTION

Caution indicates a potentially hazardous situation that, if not avoided, may potentially result in minor or moderate injury. It may also be used to alert against unsafe practices that may cause property damage.

WARNING

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

1.0 Safety Precautions

1.1 Operator Safety Equipment

It is the responsibility of the blast operator's employer to provide proper protective equipment to all job personnel prior to entering or working in an abrasive blasting environment. The below illustrations highlight the minimum personal protective equipment required for each abrasive blast operator.

Do not operate the abrasive blast machine without wearing adequate foot protection. Refer to OSHA 29 1910.136.

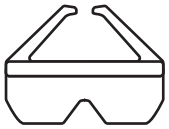
CAUTION

Heavy objects can move or fall while being blasted

SAFETY BOOTS MUST BE WORN

Do not operate the abrasive blast machine without wearing approved safety glasses. Refer to OSHA 29 CFR 1910.133.

CAUTION

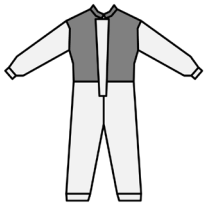


Abrasive can be blown in the face and eyes of the operators when filling the blast machine.

SAFETY GOOGLES REQUIRED

Do not operate the abrasive blast machine without wearing abrasive resistant blast suit/coverall. Refer to OSHA 29 CFR 1910.132/.138.

CAUTION



Media ricochet generated from the blast cleaning operation can be dangerous and all personnel within the area must wear adequate protection

SAFETY SUIT REQUIRED

Do not operate the abrasive blast machine without wearing proper hearing protection. Refer to OSHA 29 CFR 1926.101.

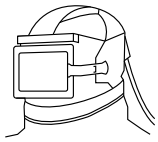
CAUTION

Long-term noise exposure to the blasting process can be damaging to one's hearing.

EAR PROTECTION REQUIRED

Do not operate the abrasive blast machine without wearing NIOSH approved respiratory protection. Refer to OSHA 29 CFR 1910.134.

WARNING

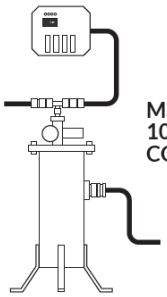


Abrasive blasting produces dust which may containg silica and other toxic substances that can cause serious diseases if inhaled.

WEAR RESPIRATOR HELMET & HEAD SOCKS

Do not use breathing air that is not adequately filtered and monitored to meet OSHA Grade D standards (maximum permissible CO is 10ppm). Verify that all air sources are breathable quality and use a carbon monoxide monitor. Refer to OSHA 29 CFR 1910.134(i).

WARNING



Breathing air provided by oil lubricated air compressor can contain carbon monoxide, which can cause asphyxiation and result in death.

BREATHING AIR FILTER MUST BE USED.

1.2 Rules for Safer Operation

1.2.1 Maintain Vessel Integrity

1.2.1.1Do not exceed the maximum working pressure of the blast machine, which is 150PSI, labeled on the nameplate attached to the machine 1. (Each machine is hydro statically pressure tested to 300PSI.)

WARNING

EXCESSIVE COMPRESSED AIR PRESSURE COULD RUPTURE THE BLAST MACHINE.

1.2.1.2. Do not operate the blast machine if any part of the machine is worn or damaged.

1.2.1.3. Do not hammer, strike, weld, grind, or drill on the blast machine. Any modifications or alterations could weaken the vessel.

1.2.1.4. Inspect the interior condition of the vessel regularly for corrosion.

1.2.2 Transporting the machine

1.2.2.1. Always empty the blast machine before lifting or hoisting.

1.2.2.2. Always use the lifting Jaws on the machine. Do not connect slings to other parts of the machine.

1.2.2.3. Always make sure the blast machine is situated on a flat sturdy surface.

WARNING

THE BLAST MACHINE SHOULD NOT BE OPERATED IN A POTENTIALLY EXPLOSIVE ENVIRONMENT. STATIC ELECTRICITY CAN BE GENERATED BY THE FRICTION OF THE ABRASIVE PARTICLES PASSING THROUGH THE HOSE AND HITTING THE SURFACE BEING BLASTED. STATIC ELECTRICITY CAN SHOCK THE OPERATOR AND CAUSE FIRES/EXPLOSIONS BY IGNITING FLAMMABLE/ COMBUSTIBLE MATERIALS.

2.0 Product Introduction

2.1 This manual is provided to assist you in the safe operation and proper maintenance of the blast machine. Only use genuine Blastline parts and accessories to ensure safe and efficient operation.

2.2 The basic components of the automatic blast machine models are shown in Figure 1 & 2.

2.3 Compressed Air Requirements

The size of the compressor required depends on the nozzle size and desired blasting pressure.

Refer to the table 4 to determine CFM and HP requirements.

Blasting productivity and efficiency levels are determined by the volume and pressure of the air passing through the blast nozzle.

Rule of Thumb: Every psi below 100 psi pressure at the nozzle equates to a 1.5% loss of blasting efficiency. Maximize compressed air volume and pressure at the nozzle to maintain high levels of productivity.

Note: 20 ltr blast machines has a working pressure of 1.12 MPa/ 162 PSI.

3.0 Blasting Abrasives

3.1 Abrasive Type

Abrasives play a crucial role in defining overall blasting efficiency, productivity and cleanliness. Make sure the selected abrasive is compatible with the surface being blasted. Select the abrasive size that will provide the desired surface profile and surface finish.

There are various types of abrasives in ranging sizes-

- Slags - Coal Slag, Copper Slag etc.
- Steel - Steel Shots, Steel Grits etc.
- Garnet, Olivine etc.
- Aluminum Oxide
- Crushed Glass Grit
- Glass beads
- Plastic media
- Agricultural media - walnut shells, corn cob grit etc.

There are coarse, medium, small and fine sizes of abrasives. Choose the correct size depending upon the profile and cleaning standard requirements.

CAUTION

DO NOT BLAST WITH SILICA SAND OR ANY ABRASIVE WITH MORE THAN ONE PERCENT FREE SILICA. CRYSTALLINE (FREE) SILICA IS RECOGNIZED WORLD-WIDE AS A CLASS 1 CARCINOGEN AND CAN LEAD TO SERIOUS INJURY OR FATAL RESPIRATORY DISEASE

OBTAIN A MATERIAL SAFETY DATA SHEET (MSDS) FOR THE ABRASIVE PRIOR TO BLASTING TO ENSURE NO HARDOUS SUBSTANCES ARE PRESENT.

Below are the most common abrasive blast cleaning standards:

Table 3

	Brush Off	Industrial	Commercial	Near White	White Metal
ISO 8501	SA 1		SA 2	SA 2.5	SA 3
SSPC	SP 7	SP 14	SP 6	SP 10	SP 5
NACE	No. 4	No. 8	No. 3	No. 2	No. 1

Typical Profiles of Various Abrasives

Table 1 & 2

Abrasive	Size Distribution Range	Profile Range Micron	Profile Range	Surface Finish	NACE Standard	SSPC Standard
Copper Slag	8/40	50 - 100	2-4	SA - 2.5	No. 2	SP - 10
Copper Slag	12/40	25 - 75	1 - 3	SA - 2.5	No. 2	SP - 10
Coal Slag	12/40	25 - 75	1 - 3	SA - 3	No. 1	SP - 5
Garnet	30/60	25 - 75	1 - 3	SA - 3	No. 1	SP - 5
Staurolite	Course 40/40	13 - 50	0.5 - 2	SA - 2.5	No. 2	SP - 10
Steel Grit	G -40	50 - 100	2 - 4	SA - 2.5	No. 2	SP - 10
Steel Shot	S - 280	50 - 100	2 - 4	SA - 2.5	No. 2	SP - 10

Abrasive	Shape	Hardness	Specific Gravity (g/cc)	Bulk Density Tons/ M^4	Comprative Recyclability
Steel Grit - GP	Angular	46-50 HRC	7.6	3.7	High
Steel Grit - GL		56-60 HRC			
Steel Grit - GH		Min 60 HRC			
Steel Shot - Normal	Spherical	44-50 HRC	7.4	4.45	High
Aluminium Oxide	Angular	9.0 MOH	3.9-3.94	2.4	Medium
Glass Beads	Spherical	5.5 MOH	2.45 - 2.5	1.5	Medium
Garnet	Sub-Angular	7.5-8.0 MOH	4.1	2.4	Medium - Low
Coal Slag	Angular	6.0-7.0 MOH	2.63	1.35	Low
Copper Slag	Angular	6.0-7.0 MOH	3.4	1.9	Low
Crushed Glass	Angular	6.0 MOH	2.5	1.5	Low
Silica Sand	Spherical	5.0-6.0 MOH	2.65	1.5	Low
Sodium Bicarbonate	Angular	3.0 MOH	2.25	0.8	Low
Corn Cobs/ Walnut Shells	Angular	2.0-2.5 MOH	1.15	0.6	Medium-Low
Olivine	Sub-Angular	7-8 MOH	3.3	1.7	Low

Basic Components of Jumbo Blaster

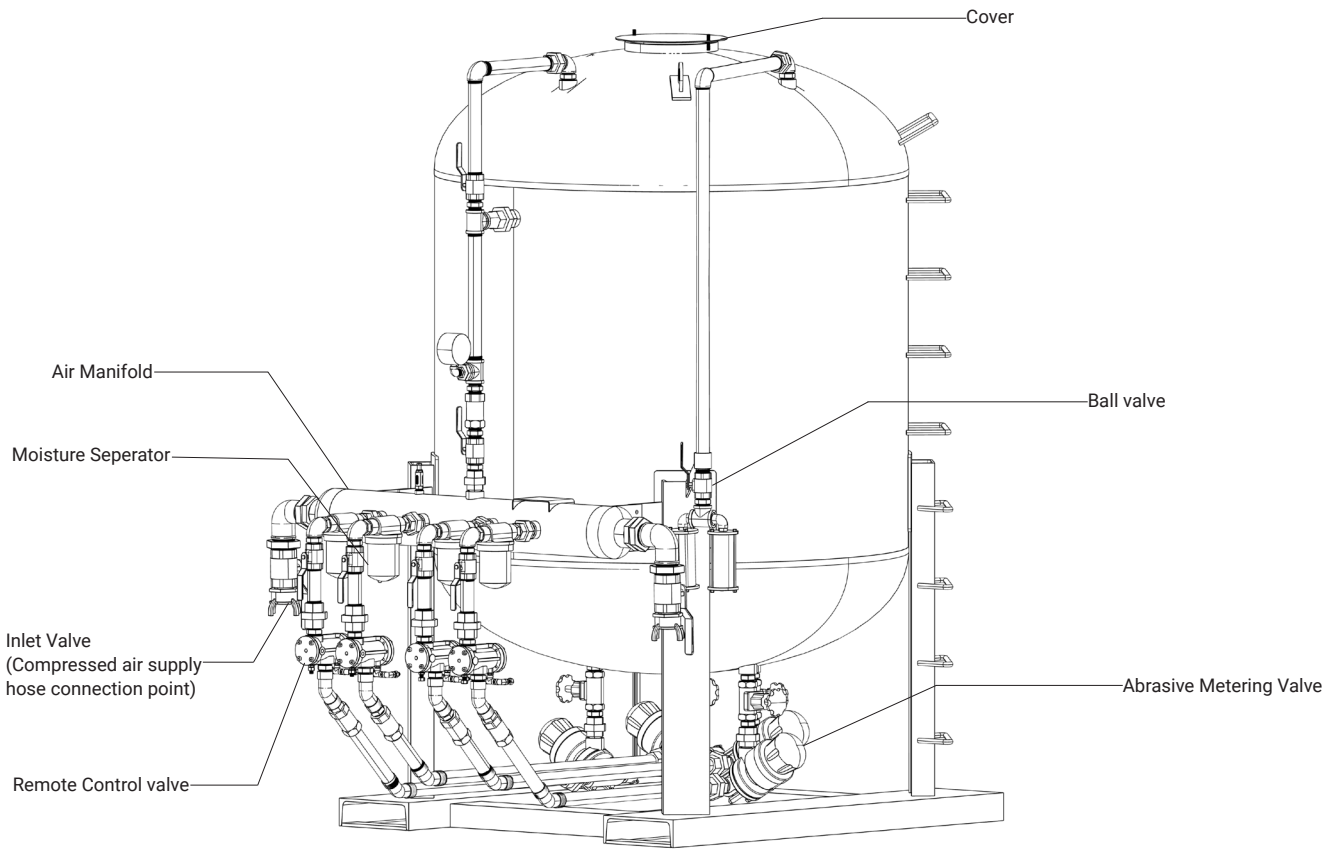


Figure: 1

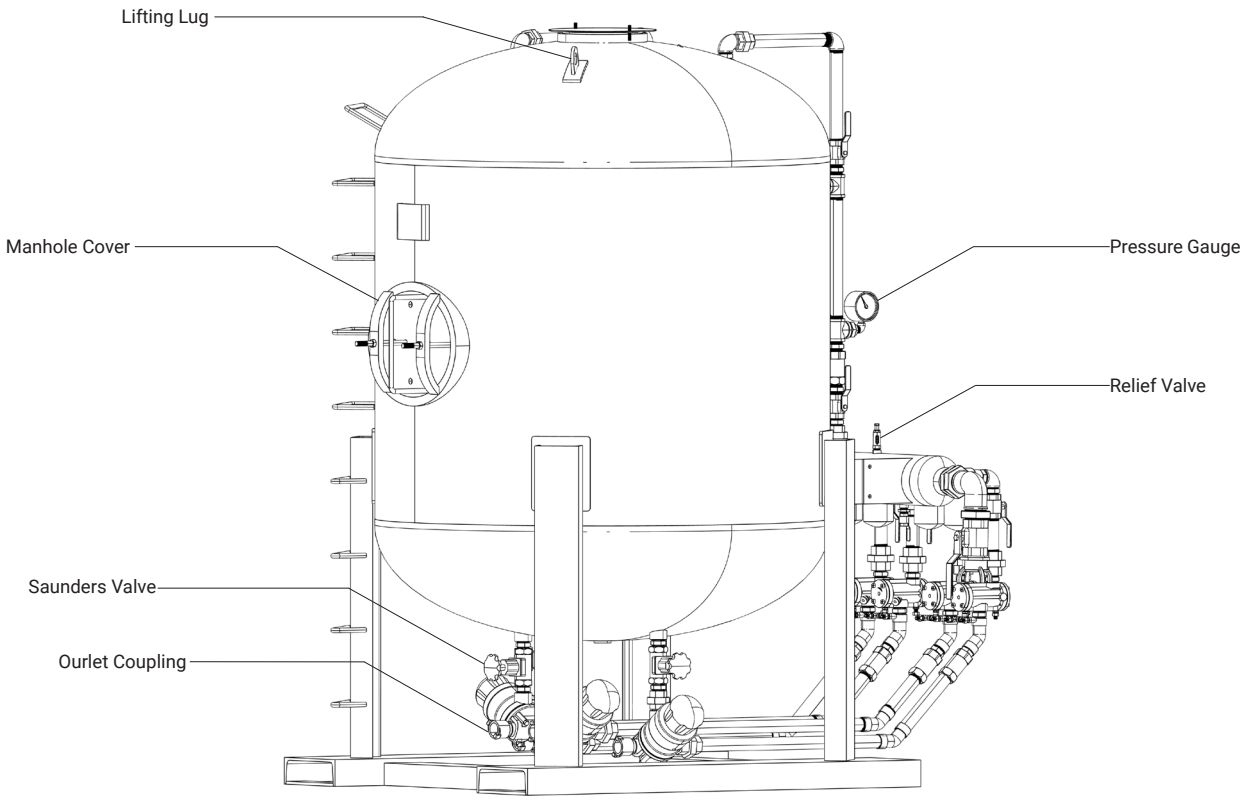


Figure: 2

Compressed Air Requirements for Various Nozzles

Table 4

Nozzle Orifice	Pressure (psi) (bar)	50 3.5	60 4.2	70 4.9	80 5.6	90 6.3 ▼	100 7 ▼	125 8.5
No: 3 3/16" 5mm	**Air Volume**							
	CFM	26	30	33	38	41	45	55
	m3/min	0.73	0.84	0.92	1.06	1.15	1.26	1.54
	Abrasive kg/hr	85	97	111	123	136	136	180
No: 4 1/4" 6mm	**Air Volume**							
	CFM	47	54	61	68	74	81	98
	m3/min	1.31	1.51	1.71	1.9	2.08	2.27	2.75
	Abrasive kg/hr	152	178	200	231	254	280	336
No: 5 5/16" 8mm	**Air Volume**							
	CFM	80	90	100	115	125	140	170
	m3/min	2.16	2.5	2.83	3.16	3.53	3.84	4.71
	Abrasive kg/hr	255	302	342	380	420	460	552
No: 6 3/8" 9.5mm	**Air Volume**							
	CFM	110	125	145	160	175	200	235
	m3/min	3.02	3.53	4	4.5	4.85	5.5	6.64
	Abrasive kg/hr	378	433	490	544	596	653	784
No: 7 7/16" 11mm	**Air Volume**							
	CFM	150	170	200	215	240	255	315
	m3/min	4.12	4.76	5.44	6.09	6.73	7.11	8.8
	Abrasive kg/hr	507	585	655	744	820	896	1075
No: 8 1/2" 13mm	**Air Volume**							
	CFM	200	225	250	275	300	340	410
	m3/min	5.46	6.28	7.06	7.85	8.85	9.46	11.46
	Abrasive kg/hr	657	756	856	951	1050	1148	1378

* Abrasive consumption is based on material with a density of 1.5kg per liter
1 Bar = 14 Psi 1 m^3/m = 35 CFM

▼ Ideal Pressure Values

Air and Blast Hose Selection

Maximum Recommended Air Flow (CFM) ANSI Standard

Table 5

PSI \ SIZE	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"
60	8.0	18	34	50	93	195	290	560	900
80	10.5	23	44	65	120	255	380	720	1200
100	13	29	54	80	150	315	470	900	1450
150	20	41	80	115	220	460	680	1350	2200

For Conversion to Cubic Meter divided by 35.3

Note: Never use blast hose that appears to have worn out areas on the internal rubber tube. Inspect hose daily for soft spots which indicate the need for replacement. The life of the blast hose is approximately 400-500 hours. The life depends on type of abrasives, air pressure, air temperature, ambient air temperature.

Air and Blast Hose Selection

Volume (CFM) X Pressure (Psi)

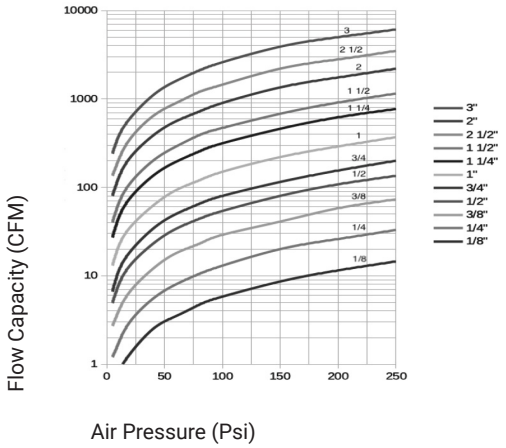


Figure: 3

Schematic of the Jumbo Blaster

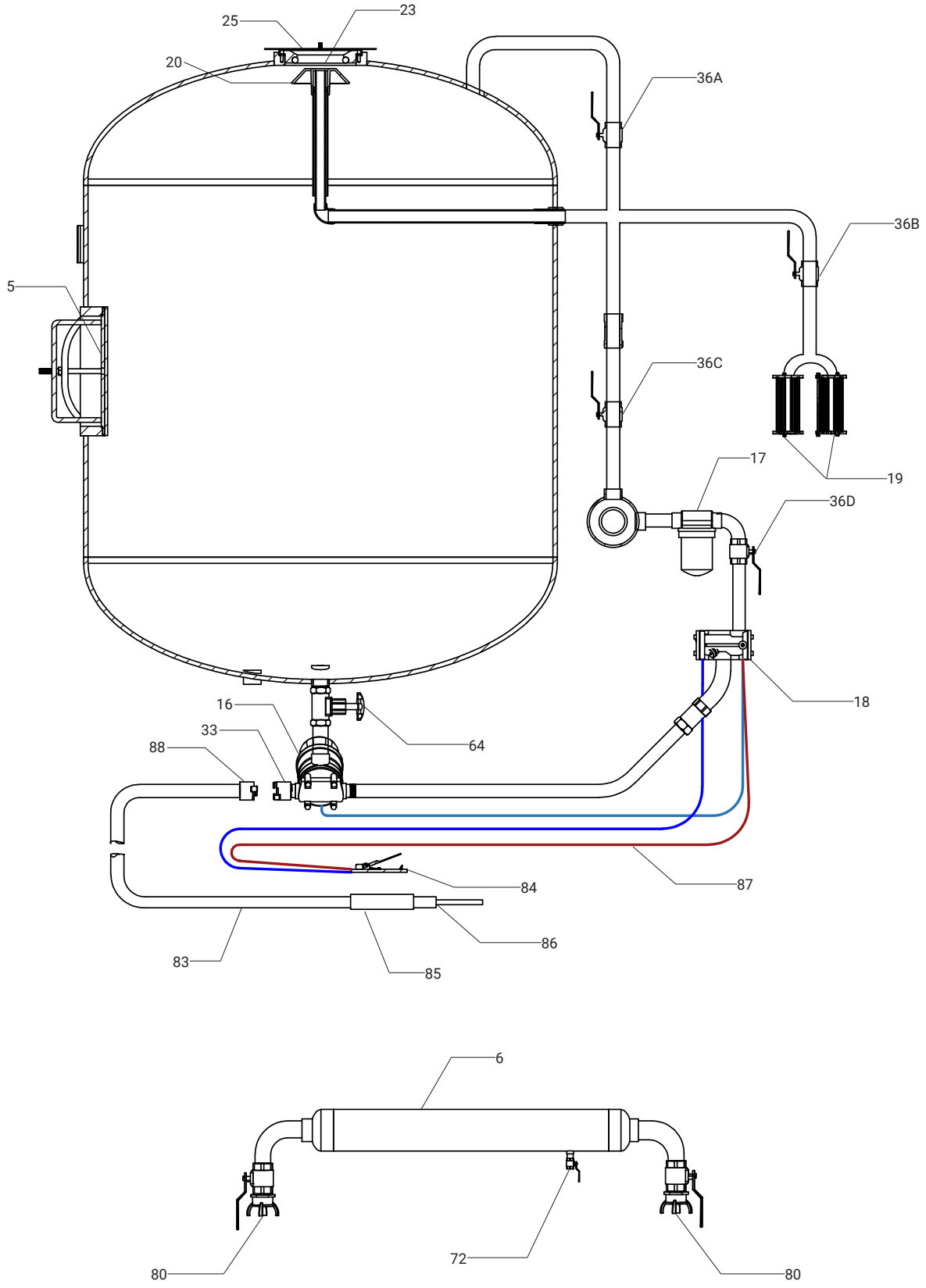


Figure: 4

4.0 Pre-Operation Inspection

4.1 Upon receiving the abrasive blast machine, inspect the blast machine and remote control system for apparent and hidden damage. Check the pop-up valve, pop-up valve gasket, inspection door components, remote control components, piping, and coupling fittings. Prior to operating the blast machine, replace excessively worn or damaged parts and tighten all fitting connections. DO NOT OPERATE THE BLAST MACHINE IF FITTINGS OR CONNECTIONS ARE LOOSE. Note: Always ground the blast machine.

4.2 Prior to placing abrasives in the blast machine, inspect and test the remote control system.

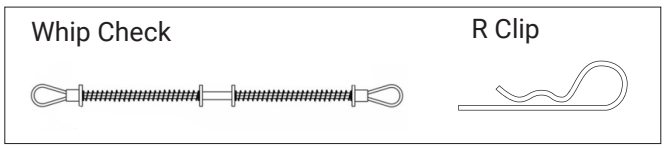
4.3 Check the blast hose, nozzle holder, and couplings for wear and damage. Replace any components or parts that are excessively worn or damaged. Check the blast hose couplings and nozzle holder for coupling gasket(s) and nozzle holder washer. Replace components if they are worn, soft, damaged, or missing.

Blastline strongly suggests that all blast hose couplings be secured together with safety clips/R clips and all blast hose and air hose connections be secured with safety cables/whip checks.

5.0 Application and restrictions

The ”Jumbo Blaster” is especially designed for blast operations which require high production rates with up to 4 operators and mobility.

5.1 Maximum working pressure
The maximum working pressure is 10 or 12 bar (option). It is indicated on the nameplate. To prevent overpressure, the user has to install an overpressure relief valve between the compressor and the BIG CLEM, which is adjusted to the rating of the compressor (air volume) and the size of the air line.



5.2 Abrasive
The “Jumbo Blaster” can be used for all types of abrasives, whereby the following should be considered:

- The maximum particle size of the abrasive depends on the nozzle size.
- The formula maximum particle size = ¼ * nozzle size can be applied.

6.0 Major Components

Figure 4 shows the major components of the Jumbo blaster:

1. Tank (volume between 500-600 litres) with
- Air manifold (item 6).
- 1 moisture separator (item 17) per operator.
- 1 Remote Control Valve (item 18) per operator (shut on / off of the air flow for the blast process).
- 1 pneumatically controlled Thompson valve (item 16) per operator
- 1 Saunders valve (item 64) per operator to shutoff the flow of abrasive during maintenance of the abrasive metering valve.
- 2 Silencers (item 19)

2. 1 deadman handle per operator (item 84) with
- twinline remote control hose (item 87)
- 1 blast hose per operator (item 83) with nozzle holder (item 85) and nozzle (item 86)

7.0 Working

7.1 How the Jumbo Blaster works
When the Jumbo Blaster is connected (connections see figure 4, item 80) to an air supply (compressor), the pop-up valve (item 20) seals off the filling port with the pop-up gasket (item 23), and the tank filled with abrasive is pressurized. During the working session, the tank remains pressurized. It is only depressurized at the end of the work period.

When the operator depresses the deadman handle (item 84), the blast process starts (for a more detailed description of the remote controls, see section 3.2). The remote control valve and the Thompson valve open, and with the blast hose (item 83), the abrasive is guided to the nozzle (item 86). As soon as the operator releases the deadman handle, the blast process stops.

7.2 How the remote controls work
7.2.1 Pneumatic remote controls (see figure 4)
After passing through the moisture separator(item 17) and the Remote control valve(item 18), the red remote control hose (item 87) guides the compressed air to the deadman handle (item 84). When the deadman handle is depressed, the air passes from the red to the blue hose and is guided back to the Remote control valve (item 18) and the Thompson valve (item 16), which will both open (for a more detailed description of both valves see special owner´s manual) When the deadman handle is released, both valves close and interrupt the flow of abrasive and air.

8.0 Set-up and operation

8.1 Requirements

- The Jumbo Blaster should only be placed on a flat and firm surface. It must be ensured that it cannot slide away or move because of the extreme slope (towable version).

When steel grit is used with a stationary Jumbo Blaster with runners, it must be ensured that it does not overturn (firm underground through the usage of a floor plate)

- A sufficient air supply is necessary (see Table 6)
- The user has to make sure, that an overpressure

relief valve is installed between the Jumbo Blaster and the compressor, because the safety valve of the Jumbo Blaster is only a warning device.

- It has to be ensured that there is sufficient space between the operators to prevent danger. If a spatial separation is not possible, a safety distance of minimum 20m between each of the operators should be ensured.

WARNING!
Non-compliance with this measure can result in death to the operator!

8.2 Set-up for initial installation or reinstallation

1. Place "Jumbo Blaster"

- Safe underground
- Engage breaks and if necessary secure against moving (towable version)

2. Install air supply for working pressure indicated on tank

- Place the compressor upwind near the blast machine (no contaminated air should enter the compressor).
- Start the compressor and bring it up to operating pressure (5 to 10min.). Only use compressors whose rating does not exceed the maximum working pressure of the pot!
- Attach an air line (appropriate dimension) with all necessary gaskets in place to the air outlet of the compressor and safety lock couplings together. Escaping air is dangerous and lowers efficiency!
- Fix the loose end of the attached air hose and carefully open the air valve of the compressor to blow out debris and moisture.

WARNING!
Not fixing loose end can result in deadly injuries!

- Close air valve.
- Install appropriate couplings to air inlet (item 80) of Jumbo Blaster (safety coupling).
- Connect air line to Jumbo Blaster and safety lock it.
- FFor trouble-free blasting, we recommend an air supply free of oil and water (air cooler with cyclone and automatic drain).

1. Attach blast hose and nozzle.

- Place blast hoses (item 83) in a straight line.
- Check gasket of couplings (item 33) for wear.
- Connect blast hoses to the length needed (All gaskets must be in place!), attach them to couplings (item 33) of Jumbo Blaster, and safety lock them.
- Choose an appropriate nozzle and attach it to the nozzle holder (with a gasket).

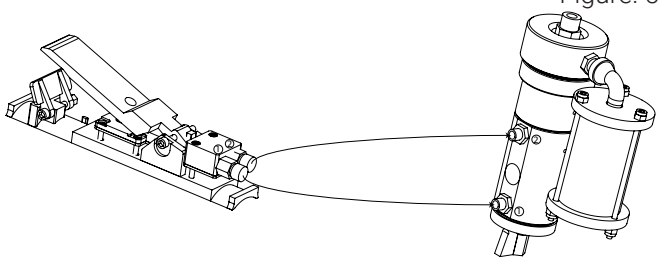
Table 6

Nozzle Bore Size	Air, Power & Abrasive Requirements	Nozzle Pressure P SI (BAR)						
		50 (3.45)	60 (4.14)	70 (4.83)	80 (5.52)	90 (6.21)	100 (6.89)	125 (8.62)
1/8 inch (3.2mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	12 (0.34) 1.75 (1.3) 70 (32)	13 (0.37) 2 (1.49) 80 (36)	15 (0.42) 2.5 (1.86) 90 (41)	18 (0.51) 3 (2.24) 100 (45)	19 (0.54) 3.5 (2.61) 110 (50)	21 (0.59) 4 (2.98) 120 (54	26 (0.74) 6 (4.47) 135 (61)
3/16 inch (4.8mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	25 (0.71) 5 (3.73) 150 (68)	30 (0.85) 8 (5.97) 170 (77)	35 (0.99) 9 (6.71) 200 (91)	40 (1.13) 9.5 (7.08) 215 (98)	43 (1.22) 10 (7.46) 240 (109)	45 (1.27) 10.5 (7.83) 16 (11.93)	60 (1.70) 16 (11.93) 320 (145)
¼ inch (6.35mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	50 (1.42) 10 (7.46) 270 (122)	55 (1.56) 12 (8.95) 300 (136)	60 (1.70) 13 (9.69) 350 (159)	70 (1.98) 16 (11.93) 400 (181)	75 (2.12) 17 (12.68) 450 (204)	80 (2.27) 18 (13.42) 500 (227)	95 (2.69) 25 (18.64) 675 (306)
5/16 inch (8mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	80 (2.27) 17(12.68) 470 (213)	90 (2.55) 20 (14.91) 530 (240)	100 (2.83) 25 (18.64) 600 (272)	115 (3.26) 27 (20.13) 675 (306)	125 (3.54) 28 (20.88) 750 (340)	140 (3.96) 30 (22.37) 825 (374)	190 (5.38) 36 (26.85) 1000 (454)
3/8 inch (9.5mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	110(3.12) 25(18.64) 675 (306)	125 (3.54) 29 (21.63) 775 (352)	145 (4.11) 32 (23.86) 875 (397)	160 (4.53) 35 (26.10) 975 (442)	175 (4.96) 40 (29.83) 1060 (481)	200 (5.66) 45 (33.56) 1100 (499)	275 (7.79) 57 (42.50) 1350 (612)
7/16 inch (11mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	150(4.25) 35(26.10) 900 (408)	170 (4.81) 40 (29.83) 100 (454)	200 (5.66) 45 (33.56) 120 (544)	215 (6.09) 50 (37.28) 130 (590)	240 (6.80) 55 (41.01) 140 (635)	255 (7.22) 60 (44.74) 155 (703)	315 (8.92) 70 (52.20) 180 (816)
½ inch (12.5mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	200(5.66) 45(33.56) 120 (544)	225 (6.37) 50 (37.28) 135 (612)	250 (7.08) 55 (41.01) 150 (680)	275 (7.79) 63 (46.98) 170 (771)	300 (8.50) 70 (52.20) 185 (839)	340 (9.63) 75 (55.93) 202 (919)	430 (12.18) 95 (70.84) 252 (1145)
5/8 inch (16mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	300 (8.5) 70(52.20) 190 (862)	350 (9.91) 80 (59.66) 220 (998)	400 (11.33) 90 (67.11) 240 (1089)	450 (12.74) 100 (74.57) 270 (1225)	500 (14.16) 110 (82.03) 300 (1361)	550 (15.58) 120 (89.48) 330 (1497)	700 (19.82) 150(111.85) 400 (1814)
¾ inch (19mm)	Air - cu ft/min (cu m/min) Horsepower - hp (kW) Abrasive - lb/hr (kg/hr)	430 (12.18) 100 (74.57) 2700 (1225)	500 (14.16) 115 (85.76) 3100 (1406)	575 (16.28) 130 (96.94) 3500 (1588)	650 (18.41) 145(108.13) 3900 (1769)	700 (19.82) 160(119.31) 4300 (1950)	800 (22.66) 175(130.50) 4700 (2132)	1100(31.15) 215 160.33) 5700 (2586)

1. **Install deadman handle and remote control hoses (pneumatic controls**

• Pneumatic remote controls (see figure 5)

Figure: 5



- Connect the blue and red remote control hoses to the correct port of the deadman handle. Connect one end of the red or blue twinline hose to the port marked 1 on the RCV and the other end to the port marked 1 on the deadman handle. Do the same for the other colour at port marked 2.

WARNING!

A reversed connection of remote control hoses causes malfunction and danger of injuries!

• Every 1.5m band twinline hose to blast hose (Sufficient freedom of movement, because underpressure blast hose expands!).

5. **Bring Thompson valve (item 16) and Remote control valve (item 18) into operation**

• Read the attached owner´s manual if the function of the abrasive metering valve and air stop valve is unknown!

6. **Put on protective equipment.**

• Abrasive-resistant clothing.
• Airfed helmet with connection to breathing air supply (air filter) and adjustment of air volume with an air control valve attached to the belt.
• Leather gloves and safety shoes.
• Ear protection.

7. **Remove moisture from tank and check moisture separator and remote controls.**

This action requires an empty tank (no abrasive)

• Check and correct the following adjustments:
- Ball valve (item 36A and 36C) opened
- Ball valve (item 72) closed
- Ball valve (item 36B) for depressurization closed
- Ball valve (item36D) opened
- Ball valve (item 64) for abrasive opened
• Open air valve on compressor.
• Open ball valve (item 80) for air supply of air manifold to pressurize the tank
• Check remote controls for each operator.
- Depress the deadman handle (item 84). Air or air and abrasive must come out of the nozzle. Point the nozzle at a surface to prevent injuries from debris left in the tank!
- Release the deadman handle after a few seconds. Blasting must stop within a few seconds. Blasting must stop within a few seconds.

Removal of moisture.

- Depress one deadman handle (item 84) for minimum 5 minutes.

Depress other deadman handles for 1 minute (removal of moisture from blast hoses).

• Adjust the drains of moisture separators (item 17) so that a constant stream of liquid and air is expelled under pressure.

8.3 Daily set-up

Not necessary if an initial installation or reinstallation was performed (see section 8.2).

1. **Air Supply**

• Start the compressor and bring it up to operating temperature (5 to 10 minutes).

2. **Put on protective equipment.**

• Abrasive-resistant clothing.
• Airfed helmet with connection to breathing air supply (air filter) and adjustment of air volume with an air control valve attached to the belt.
• Leather gloves and safety shoes.
• Ear protection

3. **Remove moisture from the tank and check the moisture separator and remote controls.**

This action requires an empty tank (no abrasive).

• Check and correct the following adjustments:
- Ball valve (item 36A and 36C) opened
- Ball valve (item 72) closed
- Ball valve (item 36B) for depressurization closed
- Ball valve (item36D) opened
- Ball valve (item 64) for abrasive opened
• Open air valve on compressor.
• Open ball valve (item 80) for air supply to the air manifold to pressurize the tank
• Check remote controls for each operator.
- Depress the deadman handle (item 84). Air or a blend of air and abrasive must come out of the nozzle. Point the nozzle at a surface to prevent injuries from debris left in the tank!
- Release deadman handle after a few seconds. Blasting must stop within a few seconds.

• Removal of moisture.
- Depress one deadman handle (item 84) for minimum 5 minutes.
- Depress other deadman handles for 1 minute (removal of moisture from blast hoses).
• Adjust the drains of moisture separators (item 17) so that a constant stream of liquid and air is expelled under pressure.

8.4 Operation

1. **Load abrasive into Jumbo Blaster.**

• Depressurize tank
- Close ball valve (item 80)
- Open ball valve (item 36B)
• During depressurization noise level is above 85dB. Wear ear protection!
• Open cover (item 25) of filling port.
• Load abrasive into tank.
- Silo.
- Conveyor
• Close cover (item 25) if necessary.

2. **Blasting.**

• Pressurize tank.
- Close ball valve (item 36B)
- Open ball valve (item 80)
• Adjustment of abrasive metering valve (2 persons are necessary).
- If the flow of abrasives is not sufficient, release the deadman handle and adjust the Thompson valve. Depress the deadman handle and check the

abrasive flow. Repeat the process till sufficient flow is attained.

8.5 Shut down

This section only refers to a maximum of 1 day of interruption of work without moving equipment.

1. **Depressurization of tank.**
- lose ball valve (item 80)
- Open ball valve (item 36B)

2. **Remove air line.**
- Connections on air manifold (item 80).

3. **Remove and roll up blast hoses.**
- No danger of stumbling.
- No damage through over-passing vehicles.

4. **Close cover (item 25).**
- Abrasive could get moisture.

8.6 shut down for a longer period of time

1. **Empty tank of all abrasive.**
- To prevent problems with moist abrasive.

2. **Depressurize tank**
- Close ball valve (item 80)
- Open ball valve (item 36B)

3. **Remove air line**
- Connections on air manifold (item 80).

4. **Remove and roll up blast hoses**
- No danger of stumbling
- No damage through over-passing vehicles.

5. **Close cover (item25)**
- Abrasives could get moisture.

9.0 Maintenance

9.1 General

During operation blast machines are exposed to wear. IDuring operation, blast machines are exposed to wear. In order to ensure safe operation and high efficiency, the blast machines should be maintained according to the following checklists.

Prior to maintenance, make sure that the air valve of the compressor is closed and the whole system is depressurized!

9.1 Daily check list

1. **Tank**
- Check gasket of filling port (item 23) and replace it when wear is detected (possible from the outside).
- Check pop-up valve of filling port (item 20) and replace it when it is worn.

2. **Air hose and blast hose.**
- Check hoses for sharp bends, causing high loss of energy and rapid wear.
- No vehicles should pass over hoses!

3. **Nozzle and nozzle holder.**
- Check gaskets of nozzle holders and replace them when wear is detected.

4. **Thompson Valve, Remote control valve and deadman handle**
- Check rubber button of deadman handle (item 84) for tight fit and replace it when it is worn.

9.2 Weekly check list

1. **Moisture separator (item 7).**
- Remove and check the filter element. If necessary, clean the filter and sight glass with soap and warm water, and dry it with compressed air.
- A dirty filter causes loss of pressure in system!

2. **Silencer (item 19).**
- Check for wear or blockage and clean or replace the interior body.

3. **Air hoses and blast hoses.**
- Check all couplings and screws for wear or breakage and replace them if necessary.
- Check the whole blast hose by hand for soft spots (reduced wall thickness) and replace it immediately when soft spots are detected.
- Check air line (air supply) and replace it when it is worn.
- Check gaskets of couplings for wear and replace them if necessary.

9.2 Monthly check list

1. **Remote controls.**
- Check all pneumatic connections for leakage.

2. **Silencer**
- Check condition of silencer and corresponding piping.

10.0 Trouble-shooting

Problems of the external electrical box are not included.

Table 7

Problem	Probable cause	Remedy
Neither abrasive nor air comes out of nozzle.	The air valve of the compressor is closed.	Open air valve.
	Blocked moisture separator HMS (item 17).	Check and clean moisture separator.
	RCV (item 18) does not work.	• Check if air comes out of the small hole in the valve body when the valve is in operation. If this occurs pinch tube or diaphragm is damaged. • Repair or replace RCV. Read the owner's manual RCV.
	Pneumatic remote controls: Deadman handle (item 84) or remote control hose leaky.	Check and replace remote control hose or rubber button of the deadman handle if necessary.
Air but no abrasive comes out of nozzle.	Thompson valve (item 16) is closed.	Open Thompson Valve (turn metering knob to the left). See owner's manual
	Defective Thompson valve (item 16).	Read owner's manual
	Saunders Valve (item 64) closed	Open the ball valve.
	Moist abrasive prevents the flow of abrasive in bottom of the tank.	• Open inspection plate (item 5) and clean tank. • Install an after-cooler for air supply. • If moist abrasive is used, do not open choke valve (item 36D) completely.
Irregular flow of abrasive comes out of nozzle.	Incorrectly adjusted abrasive metering valve	Check adjustment and open it completely if necessary.
	Clogging.	Check the nozzle and the gasket of the nozzle for wear and replace them if necessary.
	Choke valve (item 36D) incorrectly adjusted.	Adjust choke valve correctly.
Too much abrasive comes out of nozzle.	Thompson Valve (item 16) opened too much.	Check and correct adjustments (metering knob).
	Choke valve (item 36D) not completely opened.	Check and open completely.
The Pop-up valve does not remain closed.	Insufficient air volume or pressure.	Check the air pressure of compressor with needle gauge.
Pop-up valve does not seal off filling port after depressurization.	Worn pop-up valve and / or gasket.	Replace pop-up valve and / or gasket.
	Blocked guide for the pop-up valve.	Open the inspection plate, remove pop-up valve and clean guide.
The blast process does not stop when deadman handle is released.	Deadman handle is clogged (item 84).	Clean it.
	Remote control hoses incorrectly connected.	Exchange connections.

11.0 Parts List

Table 8

Item	Description	Qty
1	Shell	1
2	Top Dish	1
3	Bottom Dish	1
4	Inspection opening frame	1
5	Inspection door	1
6	Manifold	1
7	Bottom Channel	2
8	Leg Pad	4
9	Leg	4
10	Coupling	12
11	Half Coupling 21/2"	2
12	Half Coupling 11/4"	1
13	Lifting Lug	2
14	Lifting Lug pad	2
15	Manifold Support	2
16	Thompson Valve	4
17	Moisture Separator	4
18	Remote control valve	4
19	Silencer	2
20	Pop-up Valve	1
21	Pop-up valve nozzle	1
22	Pop-up valve nozzle fixture	1
23	Rubber Gasket	1
24	O-ring	1
25	Top Lid	1
26	Inspection door lock	2
27	Filter	1
28	Ladder Bar	4
29	Ladder Bar 2	5
30	Bottom Flat	4
31	Base Channel connection	2
32	Nut	2
33	2 lug coupling CFT-2	4
34	Hex nipple 11/4"	39
35	F & F elbow	8
36	Ball valve 11/4"	5
37	M & F union	9
38	F & F bend (long)	8
39	Non Return Valve	5
40	F-F Union	9
41	Hex Nipple 1/4"	24
42	Nut and tail fitting	12
43	F-F Elbow	8
44	Tee 1/4"	3

Item	Description	Qty
45	Pressure Gauge	1
46	Pipe Coupler	1
47	F & F reducer elbow	1
48	Tee 11/4"	2
49	Stud	2
50	Pipe 1	4
51	Pipe 2	2
52	Pipe 3	2
53	Pipe 4	2
54	Pipe 5	2
55	Pipe 6	2
56	Pipe 7	1
57	Pipe 8	1
58	Pipe 9	1
59	Pipe 10	1
60	Pipe 11	1
61	Pipe 12	1
62	F-F Elbow	2
63	Inspection door supporting plate	1
64	Saunders Valve	4
65	Reducer Bush	2
66	Blast hose quick coupling- 4 lug	2
67	Union elbow	2
68	Reducer Bush (Brass)	1
69	Hex Nipple 1/2"	2
70	F-F Elbow	1
71	Saftey Relief valve	1
72	Ball valve 1/2"	1
73	Pipe Support	1
74	Angle	2
75	Check Nut	1
76	Name Plate Bracket	1
77	Name Plate Bracket for Manifold	1
78	Silencer support	1
79	Inspection door handle	1
80	Ball valve 2"	2
81	Hex nipple 2"	4
82	Inspection door packing rubber	1
83	Blast Hose	4
84	Deadman Handle	4
85	Nozzle Holder	4
86	Blast Nozzle	4
87	Twinline Hose	4
88	CQT-2 Coupling	4

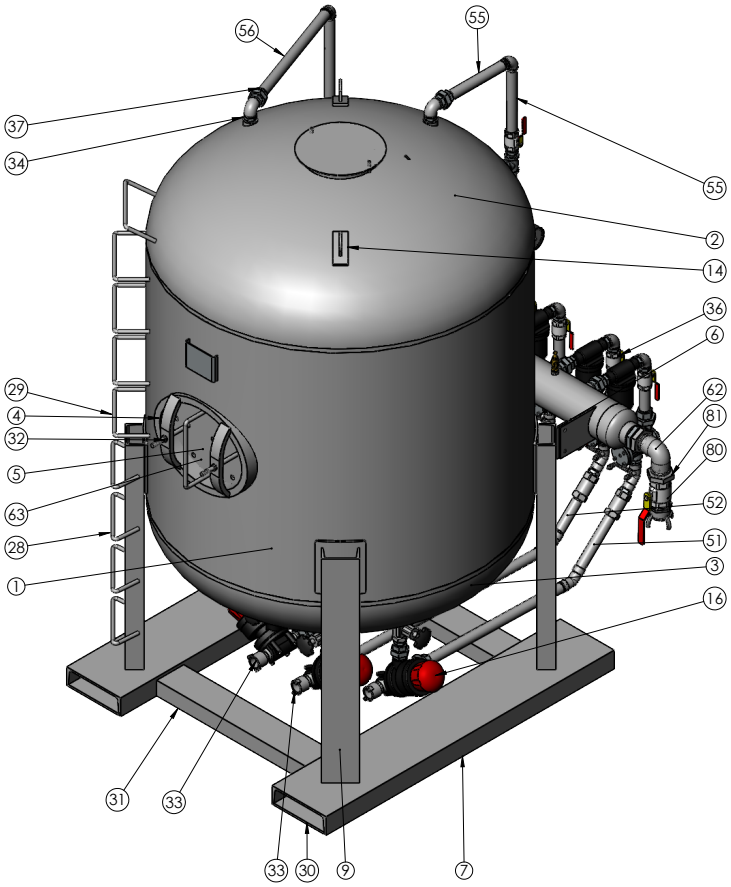


Figure: 6

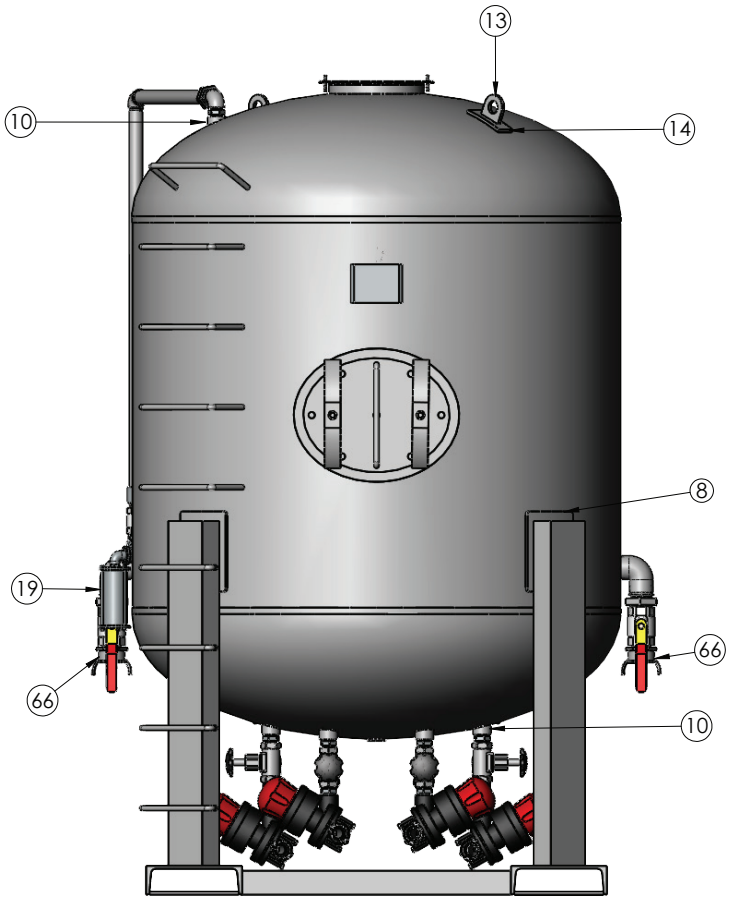


Figure: 7

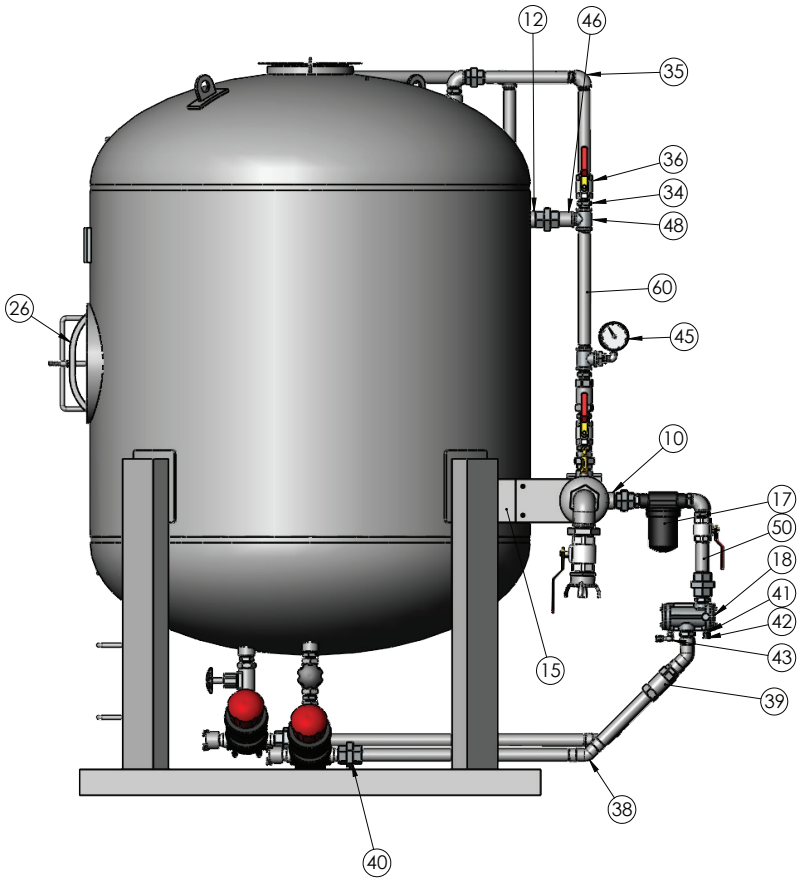


Figure: 8

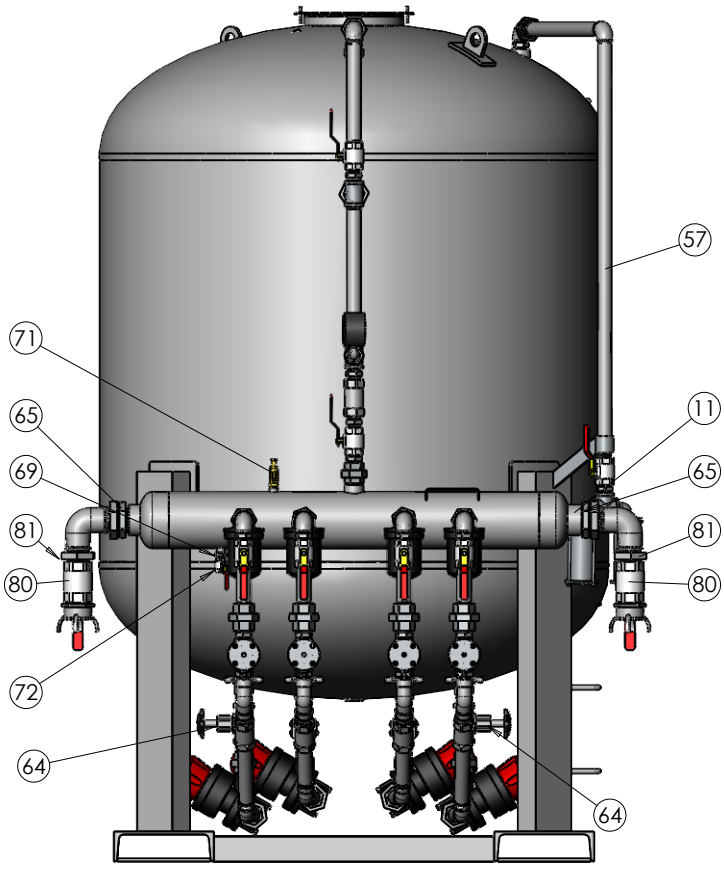
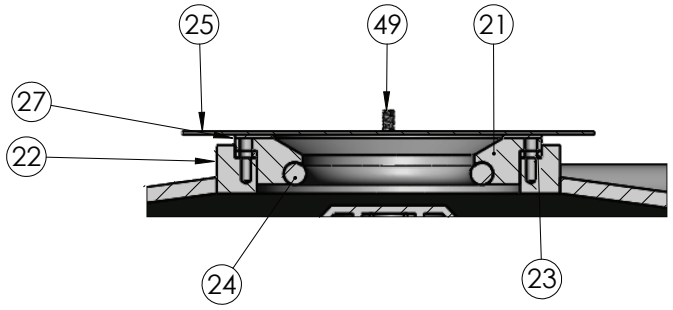


Figure: 9



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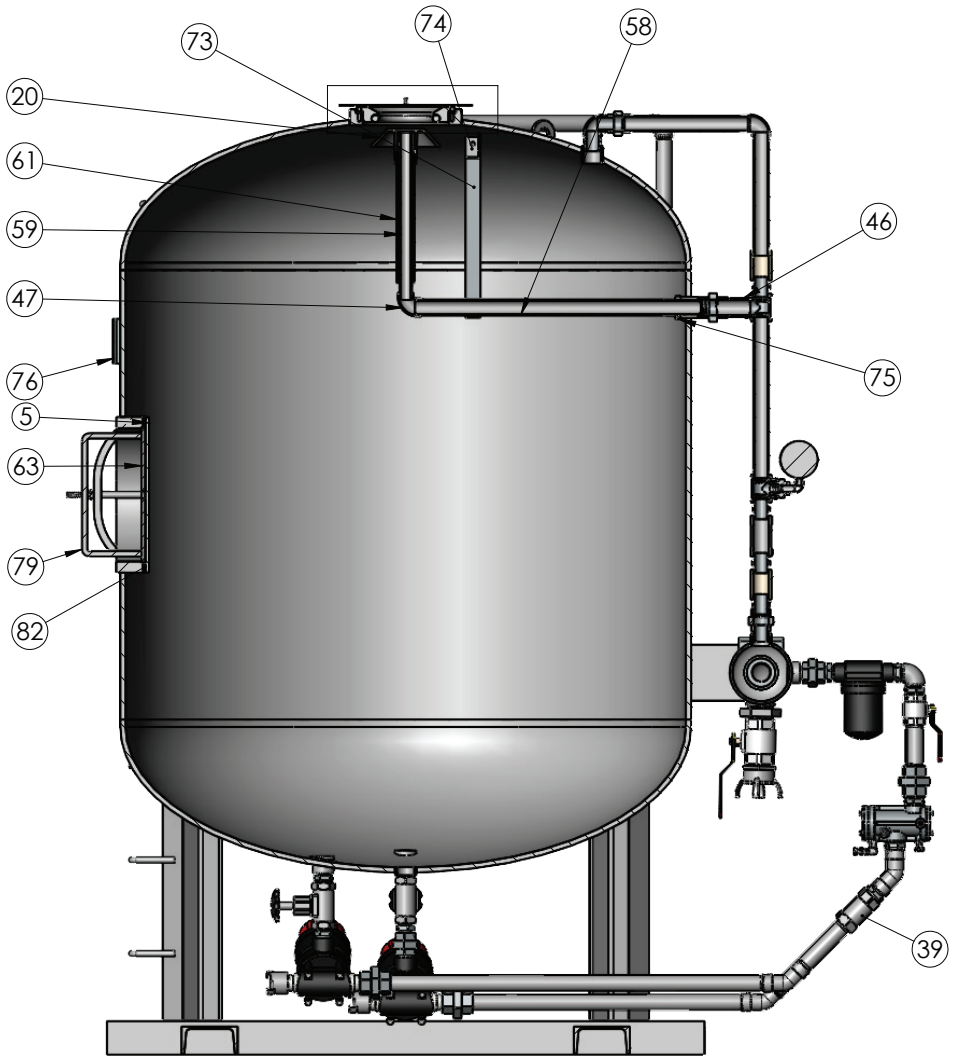


Figure: 11

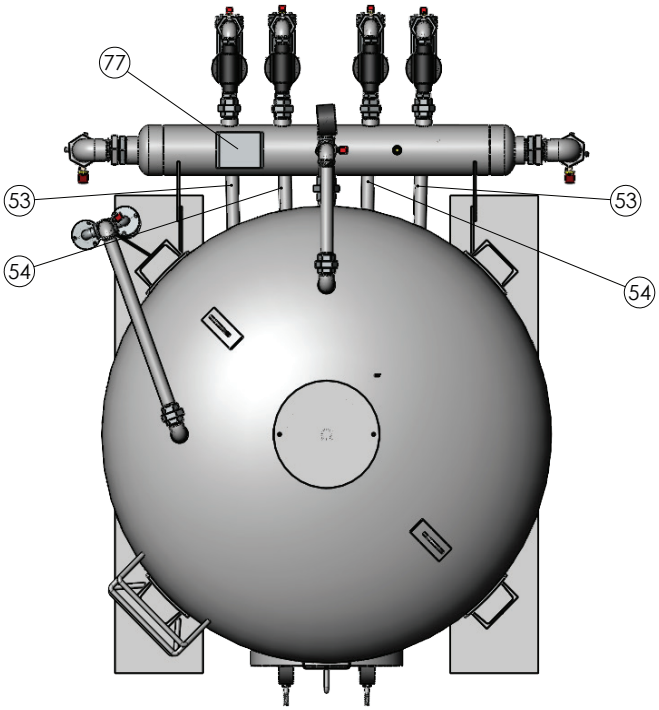


Figure: 12

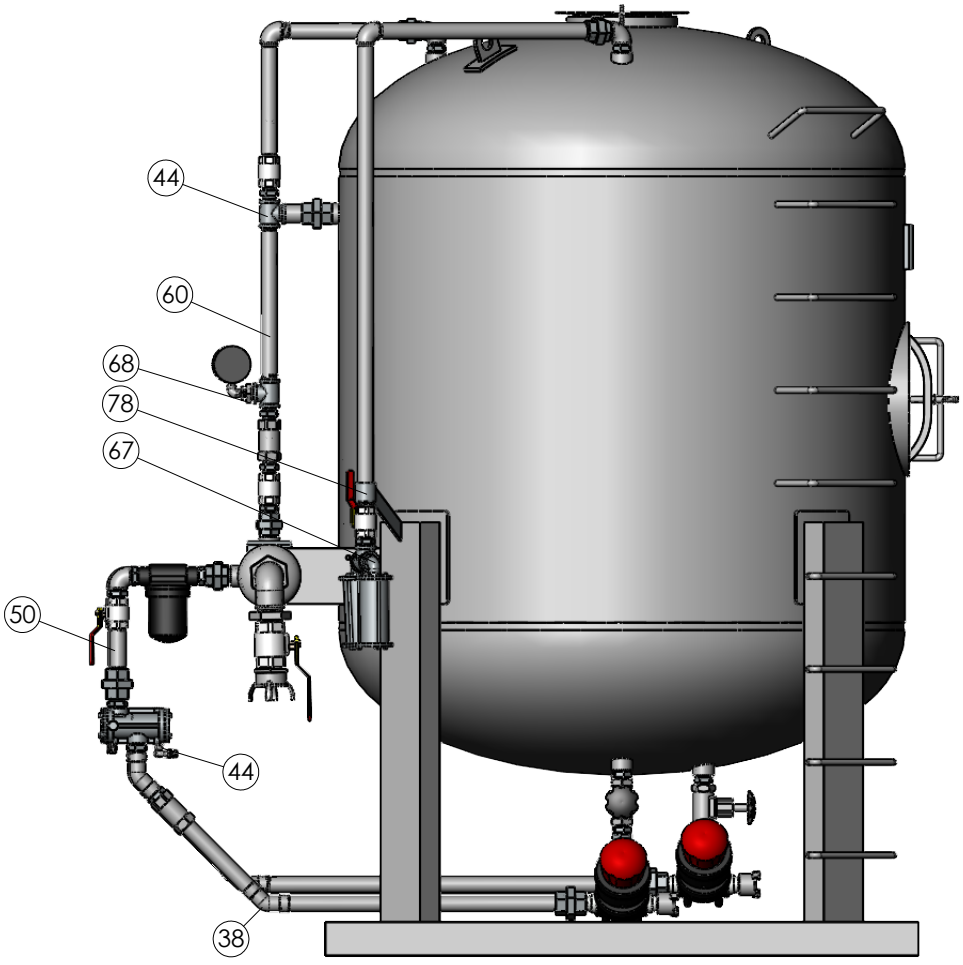


Figure: 13

Thompson Valve

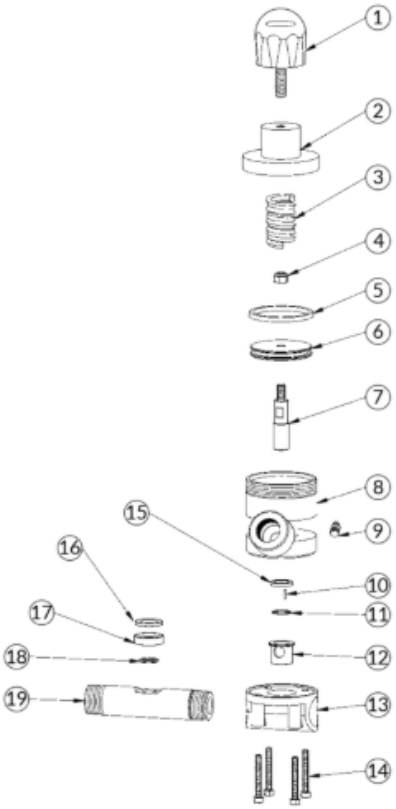


Figure: 14

Table 9

Thompson Valve Parts List			
Item	Part no.	Description	Qty
1.	TV-91000005	Control knob	1
2.	TV-91000002	Cap	1
3.	TV-91000006	Spring	1
4.	TV-91000007	Lock nut	1
5.	TV-91000008	Piston Seal	1
6.	TV-91000009	Piston	1
7.	TV-91000010	Tungsten carbide plunger	1
8.	TV-91000004	Housing	1
9.	TV-91000011	Brass hex nipple	1
10.	TV-91000019	Pin	1
11.	TV-91000013	O-ring	1
12.	TV-91000014	Tungsten carbide sleeve	1
13.	TV-91000001	Bottom	1
14.	TV-91000015	Bolt	4
15.	TV-91000012	Plunger seal	1
16.	TV-91000016	Urethane sleeve	1
17.	TV-91000017	Brush	1
18.	TV-91000018	Brush O ring	1
19.	TV-91000003	Pipe nipple 1-1/4" M x 1-1/4"M	1

Thompson Valve Mounting

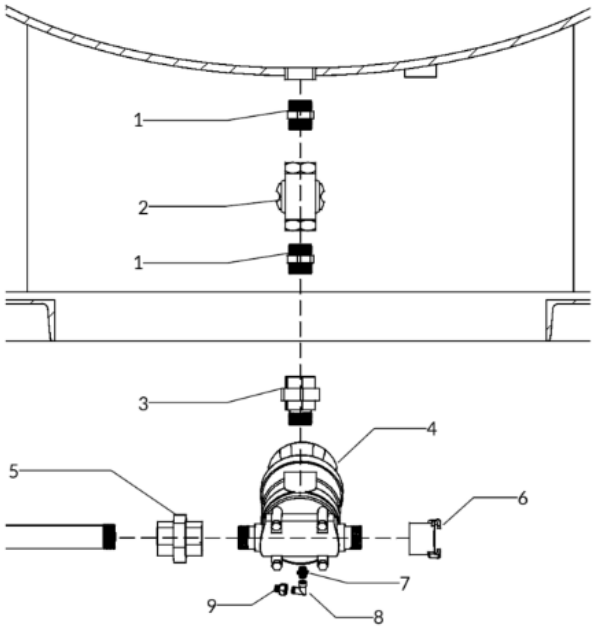


Figure: 15

Table 10

Thompson Valve Mounting Parts List		
Item	Description	Qty
1.	Hex Nipple 11/4"	2
2.	Saunders Valve	1
3.	M-F Union 11/4	1
4.	Thompson Valve	1
5.	F-F Union 11/4"	1
6.	2 lug coupling	1
7.	Hex Nipple 1/4"	1
8.	M-F Elbow 1/4"	1
9.	Nut and Tail Fitting	1

Remote Control Valve

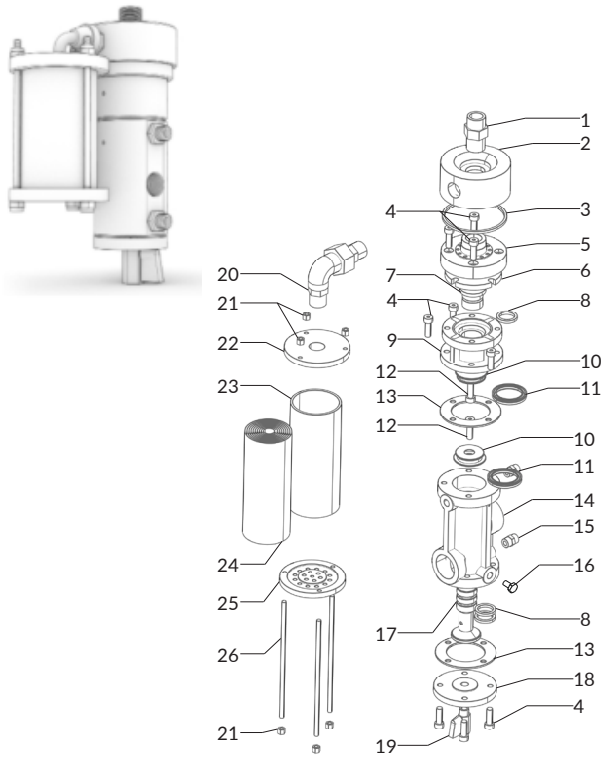


Figure: 16

Table 11

Remote Control Valve Parts List			
Item	Part no.	Description	Qty
1.	BRCV9017	Nipple	1
2.	BRCV9001	Top Manifold	1
3.	BRCV90R01	Big O Ring	1
4.	BRCV9022	M8 x 25 Bolt	12
5.	BRCV9004	Top Cover	1
6.	BRCV90R02	Diaphram	1
7.	BRCV9008	Outlet Piston	1
8.	BRCV90R04	O Ring	3
9.	BRCV9005	Exhaust Cylinder	1
10.	BRCV9009	Piston Head	2
11.	BRCV90R03	U Seal	2
12.	BRCV9023	M8 x 20 Bolt	2
13.	BRCV90R05	Cover Gasket	2
14.	BRCV9006	Valve Body	1
15.	BRCV9019	Brass Nipple - 1	2
16.	BRCV9016	Hex Bolt	1
17.	BRCV9007	Inlet Piston	1
18.	BRCV9010	Bottom Cover	1
19.	BRCV9020	Ball Valve	1
20.	BRCV9021	Union Elbow	1
21.	BRCV9024	Hex Nut	6
22.	BRCV9011	Top Plate	1
23.	BRCV9018	Silencer Pipe	1
24.	BRCV9025	Catridge	1
25.	BRCV9012	Bottom Plate	1
26.	BRCV9026	Studs	3

Moisture Seperator

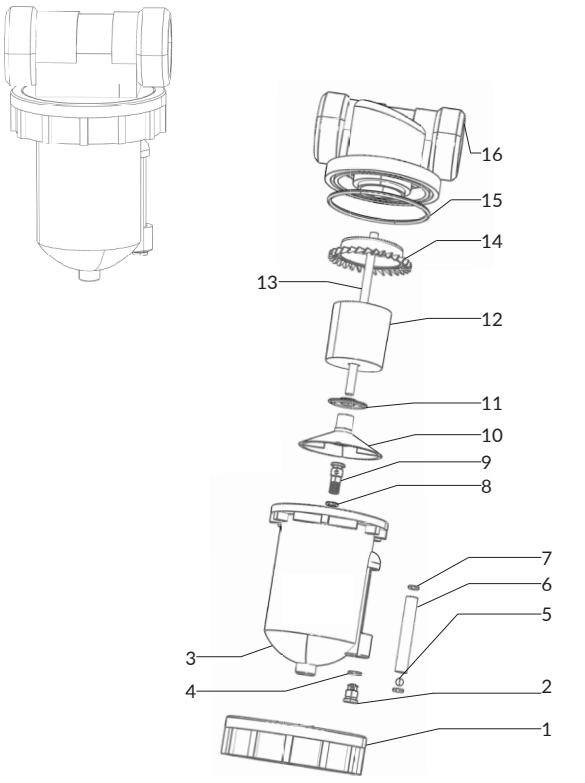


Figure: 17

Table 12

Moisture Separator Parts List			
Item	Part no.	Description	Qty
1.	BS205001	In Out Nut Zinc	1
2.	BS205005	Brass Glass Tube	1
3.	BS205004	Aluminum Cup	1
4.	BS205015	8 x 2 O Ring	1
5.	BS205012	Ball	1
6.	BS205011	Pipe	1
7.	BS205013	5 x 2.5 O Ring	2
8.	BS205014	7 x 2.5 O Ring	1
9.	BS205006	Brass Cup Top	1
10.	BS205008	Black Tapper Fan	1
11.	BS205010	Aluminum Washer	1
12.	BS205009	Bronze Filter	1
13.	BS205017	M8 Threaded Rod	1
14.	BS205007	Aluminum Fan	1
15.	BS205016	O Ring Big	1
16.	BS205003	In Out Zinc Bottom Body	1

Dead Man Handle

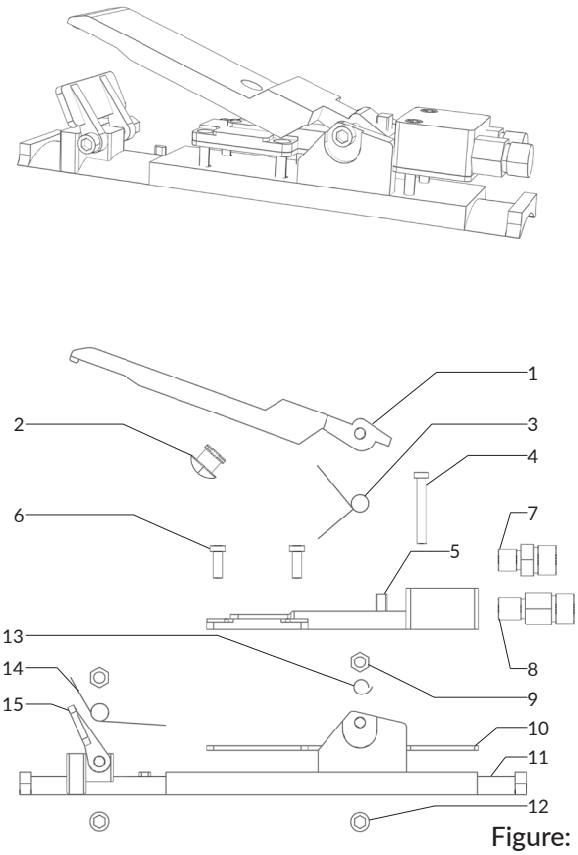


Figure: 18

Table 13

Dead Man Handle Parts List			
Item	Part no.	Description	Qty
1.	DH-70000003	Handle	1
2.	DH-70000012	Stop Button	1
3.	DH-70000006	WRE Spring	1
4.	DH-70000008	M4 x 30 SS Bolt	2
5.	DH-70000002	Middle Part	1
6.	DH-70000009	M4 x 12 SS Bolt	4
7.	DH-70000013	Brass Hex Nipple - 07 A	1
8.	DH-70000014	Brass Hex Nipple - 08 B	1
9.	DH-70000011	M5 Nylock Nut	2
10.	DH-70000004	Long Gasket	1
11.	DH-70000001	DH Bottom	1
12.	DH-70000010	M5 x 40 Allen Bolt	2
13.	DH-70000015	M5 SS Spring Washer	1
14.	DH-70000007	WRE Spring (Short)	1
15.	DH-70000005	Lever Safety Lock	1

Universal Air Couplings

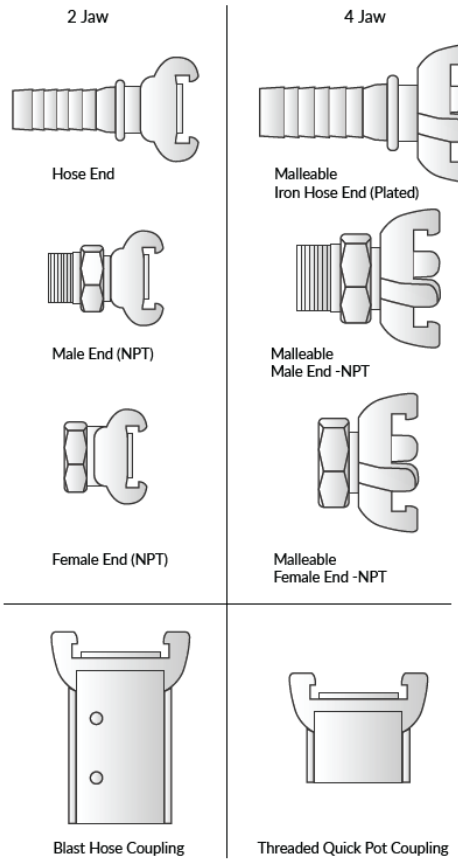


Figure: 19

Table 14

Universal Air Couplings Parts List			
Item	Part no.	Size	Description
1.	HE 038	3/8"	2 Jaw Hose End Coupling
2.	HE 050	1/2"	2 Jaw Hose End Coupling
3.	HE 075	3/4"	2 Jaw Hose End Coupling
4.	HE 100	1"	2 Jaw Hose End Coupling
5.	ME 025	1/4"	2 Jaw Male End (NPT) Coupling
6.	ME 038	3/8"	2 Jaw Male End (NPT) Coupling
7.	ME 050	1/2"	2 Jaw Male End (NPT) Coupling
8.	ME 075	3/4"	2 Jaw Male End (NPT) Coupling
9.	ME 100	1"	2 Jaw Male End (NPT) Coupling
10.	FE 025	1/4"	2 Jaw Female End (NPT) Coupling
11.	FE 038	3/8"	2 Jaw Female End (NPT) Coupling
12.	FE 050	1/2"	2 Jaw Female End (NPT) Coupling
13.	FE 075	3/4"	2 Jaw Female End (NPT) Coupling
14.	FE 100	1"	2 Jaw Female End (NPT) Coupling
15.	HE 125	1 1/4"	4 Jaw Iron Hose End Coupling
16.	HE 150	1 1/2"	4 Jaw Iron Hose End Coupling
17.	HE 200	2"	4 Jaw Iron Hose End Coupling
18.	ME 125	1 1/4"	4 Jaw Male End (NPT) Coupling
19.	ME 150	1 1/2"	4 Jaw Male End (NPT) Coupling
20.	ME 200	2"	4 Jaw Male End (NPT) Coupling
21.	FE 125	1 1/4"	4 Jaw Female End (NPT) Coupling
22.	FE 150	1 1/2"	4 Jaw Female End (NPT) Coupling
23.	FE 200	2"	4 Jaw Female End (NPT) Coupling

Common Blasting Operation Parts

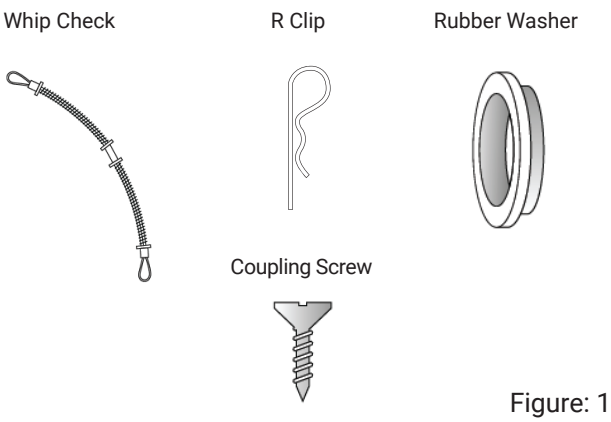


Figure: 17

Interlocking Clamps

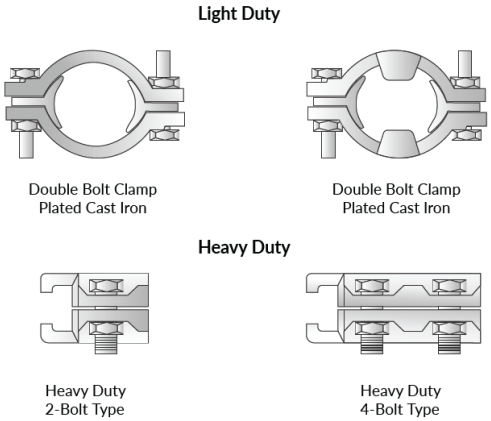


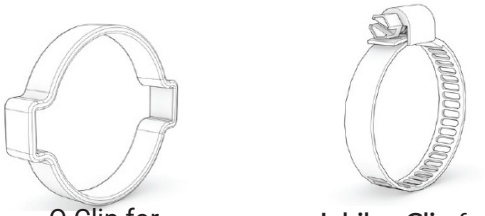
Figure: 20

Table 15

Interlocking Clamps Parts List			
Item	Part no.	Size	Description
1.	SL29	½”	Double Bolt Clamp Plated Cast Iron
2.	SL 34	¾”	Double Bolt Clamp Plated Cast Iron
3.	SL 40	1”	Double Bolt Clamp Plated Cast Iron
4.	SL 49	1 ¼”	Double Bolt Clamp Plated Cast Iron
5.	SL 60	1 ½”	Double Bolt Clamp Plated Cast Iron
6.	SL 76	2”	Double Bolt Clamp Plated Cast Iron
7.	SL 94	2 ½”	Double Bolt Clamp Plated Cast Iron
8.	2BC050	½”	Heavy Duty 2-Bolt Type
9.	2BC075	¾”	Heavy Duty 2-Bolt Type
10.	2BC100	1”	Heavy Duty 2-Bolt Type
11.	4BC100	1”	Heavy Duty 4-Bolt Type
12.	4BC125	1 ¼”	Heavy Duty 4-Bolt Type
13.	4BC150	1 ½”	Heavy Duty 4-Bolt Type
14.	4BC200	2”	Heavy Duty 4-Bolt Type

Figure: 21

Hose Clips

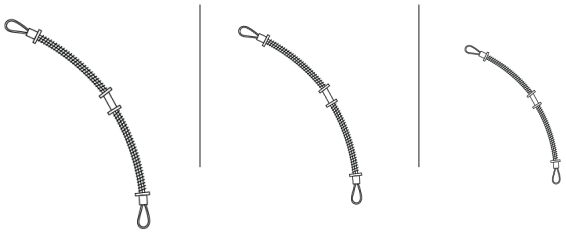


O Clip for
¼" and ⅜" hoses

Jubilee Clip for
¼",⅜",½",¾" & 1" hoses

Figure: 22

Whip Checks



38" Whip Check for hoses above 2"

20" Whip Check for hoses b/w 1" & 2"

12" Whip Check for 1" & lesser hoses

12.0 Replacement Parts List

Table 16

Item No	Description	Reference No.
1	O-Ring 8” for Jumbo Blaster	24 (Figure 10)
2	Pop-up valve 8” forJumbo Blaster	20 (Figure 11)
3	Ball valve 11/4” with handle	36 (Figure 8)
4	Non return valve 11/4”	39 (Figure 11)
5	Silencer	19 (Figure 7)
6	Moisture separator 11/4”	17 (Figure 8)
7	Moisture Separator Repair Kit	-
8	Remote Control Valve	18 (Figure 8)
9	Remote Control Valve Repair Kit	-
10	Hex Nipple rubber-lined 11/4”	34 (Figure 6)
11	Pipe Nipple rubber-lined 11/4”	-
12	Thompson valve	16 (Figure 6)
13	CFT – coupling 1/4”	33 (Figure 6)
14	Threaded pot coupling washer	-
15	2” ball valve	80 (Figure 9)
16	½” ball valve for depressurization	72 (Figure 9)
17	Safety valve 1/2”, 10bar	71 (Figure 9)
18	Ball valve 2” with handle	80 (Figure 6)
19	CQT - Coupling for blast hose	88 (Figure 4)
20	Blast hose coupling washer	-
21	Blast hose 11/4 x 20m	83 (Figure 4)
22	NHP-2 - Nylon nozzle holder for blast hose	85 (Figure 4)
23	Nozzle holder rubber washer	-
24	Nozzle No. 7 - Tungsten Carbide	86 (Figure 4)
25	Deadman handle	84 (Figure 4)
26	Deadman handle Repair Kit	-
27	Twinline remote control hose 20m	87 (Figure 4)
28	Air Filter Cartridge (replace after 3 months)	-
29	R-Clip	-
30	Coupling Screws	-
31	Whipcheck	-

Technical Reference Section

Ideal Blast System Setup

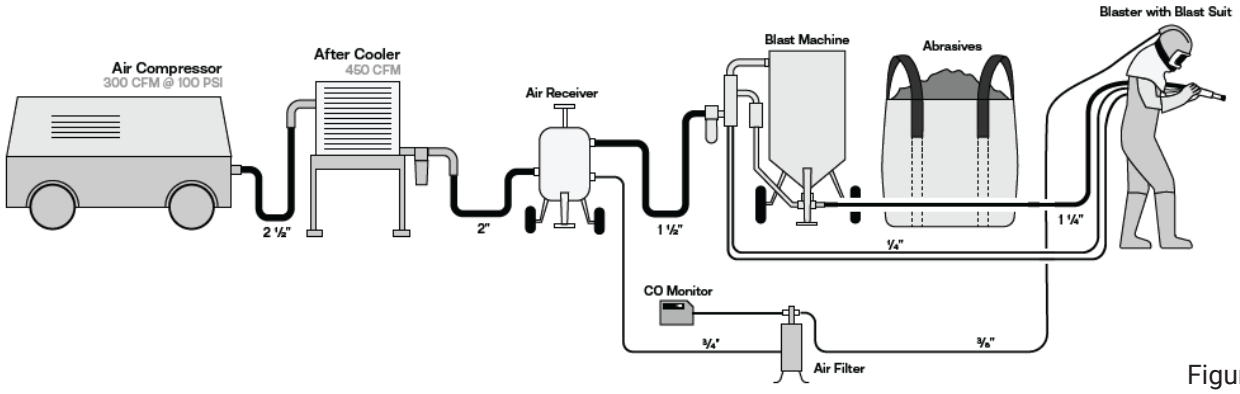


Figure 23

Configuration for double loading hopper

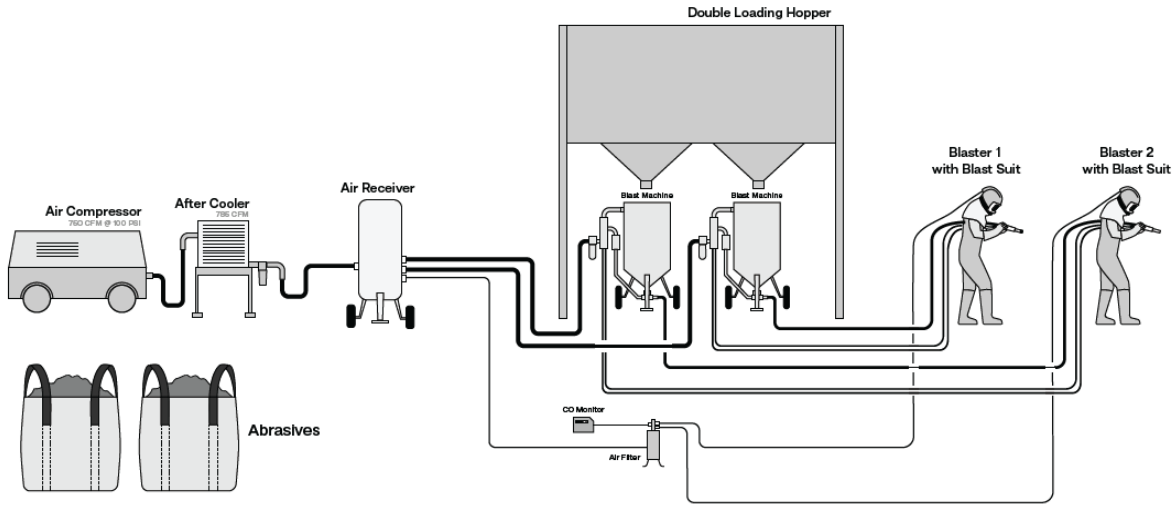


Figure 24

Unit Conversion

Table 17

Conversion Formulas		
To Convert...	**Into...**	**Multiply by...**
Air Volume:		
Cubic Feet	Cubic Meters	0.0283
Cubic Meters	Cubic Feet	35.31
Feet⁴/Minute(CFM)	Meters⁴/hour	1.699
Meters⁴/Hour(CMH)	Feet⁴/Minute	0.5882
Temperature:		
Fahrenheit	Celsius	(¹F32) x .56
Celsius	Fahrenheit	(1.8 x ºC) +32
Pressure:		
Bar	PSI	14.5038
PSI	Bar	0.0689476

Hose Fixing Safety Procedure

1. Coupling gaskets should be checked prior to each connection and immediately replaced if worn, distorted or too soft.

Figure 25

2. Make sure the hose ends are properly inserted in the coupling. If hoses must be cut and re-coupled, make sure to cut the hose ends straight edged to ensure a tight seal in the coupling.

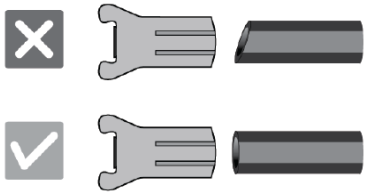


Figure 26

3. Screws and couplings should be checked and tightened each interval.

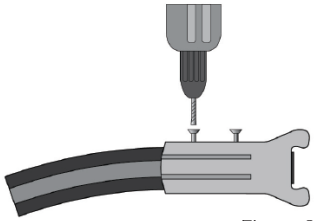


Figure 27

4. Lock couplings using a safety R-Clip to prevent disconnection.

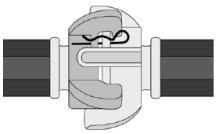


Figure 28

5. Use a whip check to arrest the hose and prevent disengagement in the occurrence of accidental twisting.

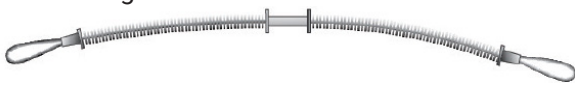


Figure 29

6. Avoid using undersized blast hose or oversized couplings to ensure tight fitting. Longer couplings can also be used along with more screws for better fitting. Couplings should be of the same brand for secure locking of jaws.

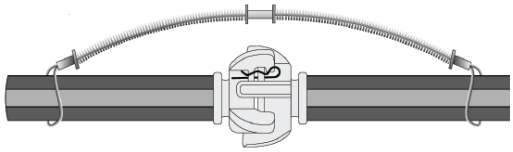


Figure 30

7. Correct screws should be used for the screw holes in the coupling. Ensure a tight seal between the hose and the coupling, but avoid over tightening the screws. Pay attention to the length of the screws as longer screws could pierce through the inner lining of the hose and accelerate the wear of the coupling.

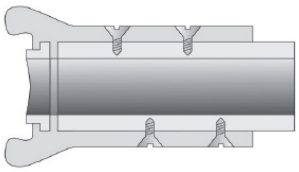


Figure 31

8. Blast hoses should always be kept straight, avoiding bends, curves and tight rolling.

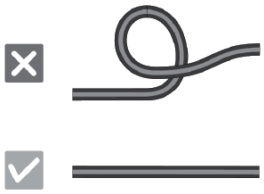


Figure 32

WARNING

Figure 33

Don't allow anything to pass over the hose while in pressure. A heavy load over the hose can potentially lead the coupling to disengage due to extreme pressure.

CAUTION

Inspection of the blast hose should be done daily. Worn out areas on the inner rubber tube or soft spots on the tube require immediate replacement. The life of the blast hose life is approximately 200 hours however determining factors include type of abrasives, air pressure, air temperature, ambient air temperature etc.

Figure 34

ASME Sec VIII D1 Specifications

ASME has established procedures to authorize qualified organizations to perform various activities in accordance with the requirements of the ASME Sec VIII Div.1 Code. We “Blastline” holding authorization to perform various activities in accordance with the requirements of the ASME Code. ASME approved authorized inspection agency (HSB) will witness all the stages right from design review till name plate stamping to meet the ASME code requirement.

1. ASME pressure vessels requires a qualified pressure vessel design engineer to prepare design calculation and drawing to.
2. Design conditions such as MAWP,MDMT and corrosion allowance will be considered by the design engineer based upon the client requirements.
3. ASME pressure vessel requires a qualified WPS,PQR & WPQ in accordance with ASME Sec IX for each and every welding.
4. A detailed ITP, Welding & NDE plan will be prepared by QCE and approved by authorized inspector for joint wise identification and stage wise inspection.
5. Approved materials as per table UCS-23 of ASME Sec VIII Div.1 to be used for pressure vessel construction.
6. All pressure parts and welding consumable materials will be witnessed by authorized inspector.
7. ASME Sec V qualified NDE personnel must perform NDE activities in ASME pressure vessel.
8. In process inspection stages (Fit Up, Welding Visual Inspection, Final Dimensional Inspection and Hydrotest) will be witnessed by the authorized inspector.
9. ASME marking will be stamped in the name plate in the presence of authorized inspector.
10. Dually signed by Blastline representative and authorized inspector a ASME data report form will be provided.

Table 18

Sl.No	Model No	Volume	Material Of Construction	Corrosion Allowance	MAWP at Max Temp	MDMT	Hydro test Pressure
1	BL-U-14160	50Ltrs	ASME SA36	0.5mm	162PSI @65°C	-5°C	250PSI
2	BL-U-20300	100Ltrs					
3	BL-U-24650	200Ltrs					
4	BL-U-24800	300Ltrs					

Notes:

CAUTION

Do not fill abrasives to the brim

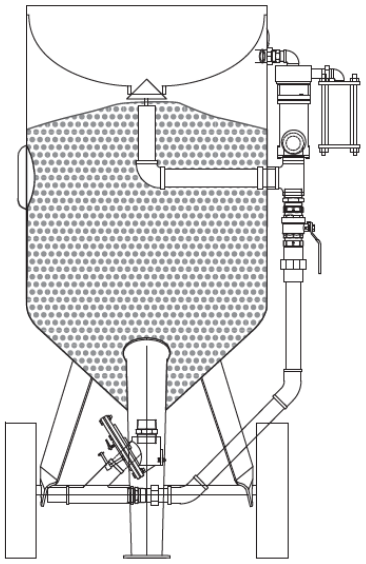


Figure 35

WARNING

1. Do not completely fill the blast machine with abrasives. Fill only 75% of the blast machine for maximum operational efficiency. By filling the blast machine 100%, there is risk of abrasives entering and getting trapped inside the remote control, causing excessive wear and damage to the remote control.
2. Avoid filling abrasives in the dish while the machine is in use. Do this to avoid abrasives falling into the blast machine through the popup valve when the deadman handle is not being operated.
3. Avoid using non-standard machines with less than 6mm steel thickness plate.
4. Avoid using non-certified machines. Only use blast machines that have been inspected and certified by a third party.
5. Recertify your machine after 3 years since the date of operation. After 3 years, conduct a thorough third-party inspection by hydrotesting, NDT Testing etc.

Notes:

Ideal Blast System Setup

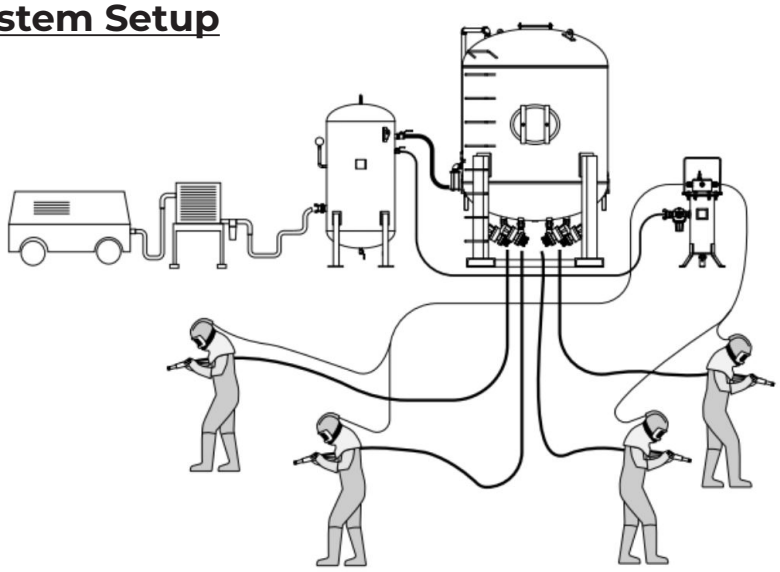


Figure 36

PRIOR TO STARTING EACH WORK SHIFT, THE FOLLOWING STEPS SHOULD BE COMPLETED BEFORE BEGINNING THE BLASTING OPERATION. Read all instructions, literature, labels, specifications and warnings sent with and affixed to all the equipment. If operation of the equipment is unclear after reading the instruction manual, contact your supervisor for instructions.

1. INSPECT THE CONDITION OF BLAST MACHINE. Check the pop-up valve, pop-up valve seat gasket, inspection door components, remote control components, piping, and compression coupling fittings. Prior to operating the blast machine replace excessively worn or damaged parts, and tighten all fitting connections. Ground the blast machine to eliminate static electricity hazards. Always use a blast machine screen and cover to prevent the entry of debris and moisture in the blast machine.

2. CHECK THE AIR LINE MOISTURE SEPARATOR. Install the unit as close as possible to the blast machine air inlet. Drain the moisture separator daily (or more often if required), and keep the filter clean.

3. CHECK THE AIR COMPRESSOR. For productive blasting, the air compressor must be sized to provide sufficient volume (cubic feet per minute, CFM) for the nozzle, and other attached air tools, PLUS a 50% RESERVE for nozzle liner wear. The compressor air outlet and connected air hose inner diameter should be FOUR TIMES the nozzle orifice size. Follow all the instructions provided by the compressor manufacturer.

4. CHECK THE BREATHING AIR SOURCE. The source of breathing air MUST meet the requirements for Type 1 gaseous air described in the Compressed Gas Association Commodity Specification G-7.1 (Grade D or higher quality). The source of air must be located in a dust free, contaminant free environment to ensure a continuous source of Grade D or higher quality breathing air at all times. If an oil-lubricated air compressor is used to supply breathing air, it MUST be equipped with a high temperature monitor and carbon monoxide alarm. Follow manufacturers maintenance instructions.

5. INSPECT THE NIOSH APPROVED AIR RESPIRATOR (HELMET). Replace all worn, damaged, or excessively dirty components. Be certain all the components including the cape, inner and outer lenses, breathing hose, breathing air supply hose, air control valve, air conditioner (if applicable) and gaskets are in perfect operating condition. Follow manufacturers maintenance instructions.

6. INSPECT THE BREATHING AIR FILTER AND FILTER CARTRIDGE. The filter cartridge should be replaced immediately if the following signs are noticed: Contamination or visible discoloration of the filter cartridge (visible only when the filter is disassembled); The presence of objectionable odor(s) and/or tastes in the air being supplied to the air supplied respirator; The presence of moisture at the outlet fitting(s); There is a large pressure drop in the system, even though the compressor and other components appear to be operating correctly. If conditions are not improved after replacing the used cartridge, DO NOT USE the filter unit until appropriate corrective measures have been taken. WARNING THE BLASTLINE AIR FILTER WILL NOT REMOVE CARBON MONOXIDE (CO), CARBON DIOXIDE (CO2), OR OTHER TOXIC VAPORS. ALWAYS USE A CARBON MONOXIDE ALARM.

7. INSPECT THE REMOTE CONTROL SYSTEM for damaged, or excessively worn components. Use only genuine Blastline replacement parts, including Twinline hose (7a). The complete system should be thoroughly TESTED PRIOR TO PLACING MEDIA IN THE BLAST MACHINE. DO NOT USE A REMOTE CONTROL SYSTEM THAT IS NOT IN PERFECT OPERATING CONDITION. NON-COMPLIANCE WITH THE ABOVE CAN CAUSE INVOLUNTARY ACTIVATION OF THE REMOTE CONTROL SYSTEM, AND CAUSE SERIOUS INJURY, DEATH, AND/OR PROPERTY DAMAGE.

8. INSPECT THE BLAST HOSE for damage, soft spots, or excessively worn internal wear. For productive blasting, blast hose should have NO sharp bends, and be aligned as straight as possible. The blast hose inner diameter should be THREE TO FOUR times the nozzle orifice size.

9. CHECK THE BLAST HOSE COUPLINGS AND NOZZLE HOLDER for a snug fit. Be certain that all coupling connections are firmly snapped together into locking position, and that safety clips are inserted through all fittings. Check that all couplings are equipped with gaskets and form a positive sea!. Always use safety cables on all blast hose and air hose connections. Replace any component that shows signs of excessive wear, damage, distortion, or softness.

10. INSPECT THE NOZZLE JACKET, NOZZLE LINER AND NOZZLE GASKET prior to each work shift. Replace any component that show signs of excessive wear, damage, distortion, or fractures. The nozzle should be replaced when the orifice is 1/16" larger than the original orifice size.

11. USE ONLY ABRASIVE manufactured, processed, and approved for abrasive blast cleaning. Abrasives should be free of harmful substances such as free silica, lead, cyanide, or arsenic. Check the safety material data sheet supplied with the abrasive.

12. CHECK THE SURFACE COATING to be blasted for toxic substances. All NIOSH, EPA, OSHA, and ACGIH regulations and recommendations should be followed to protect operators and bystanders from toxic dust and debris.