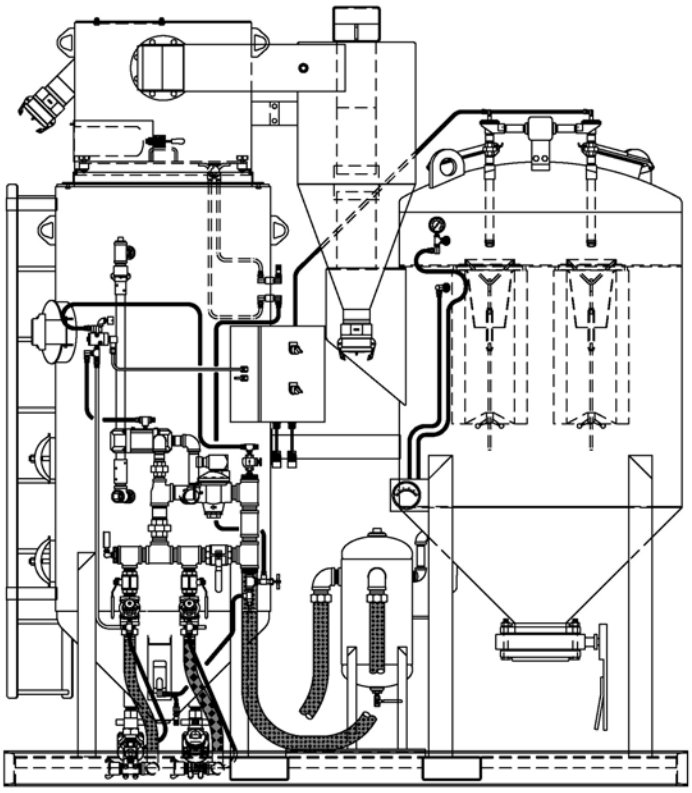
BRS2 BLAST AND RECOVERY SYSTEM

OPERATION AND MAINTENANCE MANUAL

MAY 2010



SCHMIDT®

SAVE THIS MANUAL AND MAKE AVAILABLE
TO ALL USERS OF THIS EQUIPMENT!

Manual Part Number 7200-8083-285-11

AXXIOM MANUFACTURING, INC.™
engineered abrasive systems

AXXIOM Manufacturing, Inc.
11927 S. Highway 6, Fresno, Texas 77545
800.231.2085 * 281.431.0581 * fax 281.431.1717

SCHMIDT®

WARNING

1. **Any person intending to operate this equipment or any person intending to be in the vicinity during its operation must receive proper training from his/her supervisor, employer and/or supplier. If this equipment is to be leased or rented, the supplier must assure that the lessee or renter has received proper training before the lessee or renter takes possession of the equipment. Consult Axxiom Manufacturing, Inc.**

2. **Any person authorized to operate this equipment or any person intending to be in the vicinity during its operation and who is not capable of reading and understanding this manual must be fully trained regarding the *Rules for Safer Operation* and all operating procedures, and must be made aware of all the Dangers, Warnings, and Cautions identified herein. Consult Axxiom Manufacturing, Inc.**

3. **Do Not operate any abrasive blaster or blast equipment before reading and completely understanding all the warnings, operating procedures and instructions, and the *Rules for Safer Operation* contained in this manual.**

4. **Do Not operate any abrasive blaster or blast equipment without following the *Rules for Safer Operation* and all the operating procedures and instructions. Failure to properly use blast equipment could result in serious injury or death.**

5. **Do Not perform any maintenance on any abrasive blaster or blast equipment while it is pressurized. Always depressurize the abrasive blaster vessel before loading abrasive or performing any maintenance.**

6. **Do Not use abrasives containing free silica. Silica can cause silicosis or other related respiratory damage. You must wear personal protective equipment for all abrasive blasting operations. Observe all applicable local, state and federal safety regulations in conjunction with airline filters and respiratory protection. Reference OSHA 29 CFR 1910.134.**

7. **Do Not enter areas during abrasive blasting operations without breathing protection. All personnel in the vicinity of abrasive blasting operations should wear NIOSH approved air fed respirators, hoods or helmets.**

8. **Do Not modify or alter any abrasive blaster, blast equipment or controls thereof without written consent from Axxiom Manufacturing, Inc.**

9. **Do Not use bleeder type deadman valves on any Schmidt® abrasive blaster. The use of A-BEC, Clemco or a similar bleeder type deadman valve can cause unintentional start-up without warning, which can result in serious personal injury.**

10. **Do Not sell, rent, or operate abrasive blasters without remote controls. OSHA regulations require remote controls on all blast machines. Failure to use remote controls can cause serious injury or death to the operator(s) or other personnel in the blasting area. Reference OSHA 29 CFR 1910.244(b).**

11. **Do Not repair or replace any portion of Schmidt® equipment using components that are not Schmidt® original factory replacement parts. Use of replacement components that are not Schmidt® original factory replacement parts may result in equipment failure which can result in serious personal injury and in addition will void all warranties.**

Instructions for use of manual sections

This manual contains information needed to operate and maintain your abrasive blaster. Read this entire operations and maintenance manual before using your abrasive blaster. Pay close attention to the *Rules for Safer Operation* (Section 1.0), and the Dangers, Warnings, and Cautions identified.

The purpose of safety symbols and explanations are to alert you of the possible hazards and explain how to avoid them. The safety symbols and explanations do not by themselves eliminate any danger. However, following the instructions given and taking proper accident prevention measures will greatly lower the risk of injury to personnel. Below are the three hazard levels as used in this manual.

WHITE LETTERS with RED BACKGROUND

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

BLACK LETTERS with ORANGE BACKGROUND

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

BLACK LETTERS with YELLOW BACKGROUND

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

This manual contains terms that may be specific to the abrasive blast industry. Understanding these terms will help you understand the procedures and instructions given in this manual. Please familiarize yourself with the following terms and refer to them as needed while reading this manual.

Term	Definition
Pressure Vessel	A fabricated tank (or reservoir) that is part of the abrasive blaster which is filled with compressed air and abrasive. (Also referred to as “blast vessel” or “vessel”.)
Pressurize	To manually or automatically fill the abrasive blast vessel with compressed air.
Depressurize	To manually or automatically release all the compressed air from inside the abrasive blast vessel. (Also referred to as “blowdown”.)
Blowdown	To manually or automatically release all the compressed air from inside the abrasive blast vessel. (Also referred to as “depressurize”.)
Deadman	A manually operated valve or switch that allows remote starting and stopping of the blast operation. [Also referred to as “deadman valve” (pneumatic blast controls) or “deadman switch” (electric blast controls.)]
Popup	An air pressure operated valve that seals the abrasive inlet at the top of the pressure vessel. Its operation may be manual or automatic.
Abrasive	A granular substance used in an air blast operation that is the means for blasting the surface of an object. (Also referred to as abrasive blasting media.)
Silica	The crystalline chemical compound silicon dioxide (SiO_2) which can be found in many natural abrasives and other substances. Breathing silica dust can cause respiratory diseases such as silicosis. (Also referred to as crystalline silica)

0.0 Warning Label Identification and Location

Listed below are the warning decals and the corresponding hazards related to this equipment. Refer to Figure 0.1 for images of the warning decals. Refer to Figure 0.2(a) and 0.2(b) for the locations of these warning decals on the Abrasive Blaster.

No.	Qty.	Part no.	Description	Hazard
1.	1	7031-000	Large "Schmidt"	Not Applicable
2.	2	7031-001	Medium "Schmidt"	Not Applicable
3.	3	7031-020	"BRS"	Not Applicable
4.	1	7031-017	"Inlet"	Not Applicable
5.	2	7031-054	"Warning" Airborne particle and loud noise hazard.	Airborne particles and loud noise from blast nozzle and blowdown can cause injury and loss of hearing. Wear approved eye and ear protection. See Section 1.0 and 3.10.
6.	2	7031-007A	"Danger" Pressurized vessel.	Propelled objects will cause serious injury or death. Depressurize vessel prior to performing any maintenance. See Section 6.2.
7.	2	7031-057	"Warning" Read manual before using this machine.	Read and understand operator's manual before using this machine. Failure to follow operating instructions could result in injury or damage to equipment. See Section 1.0.

1) 7031-000

2) 7031-054

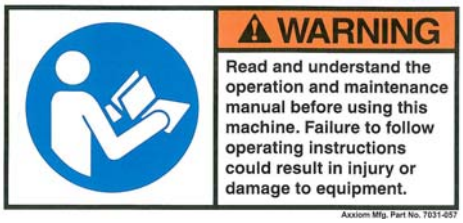
3) 7031-007A

4) 7031-057

Figure 0.1(a) – Warning decal summary

5) 7031-060

6) 7031-075



7) 7031-062A

Figure 0.1(b) – Warning decal Summary

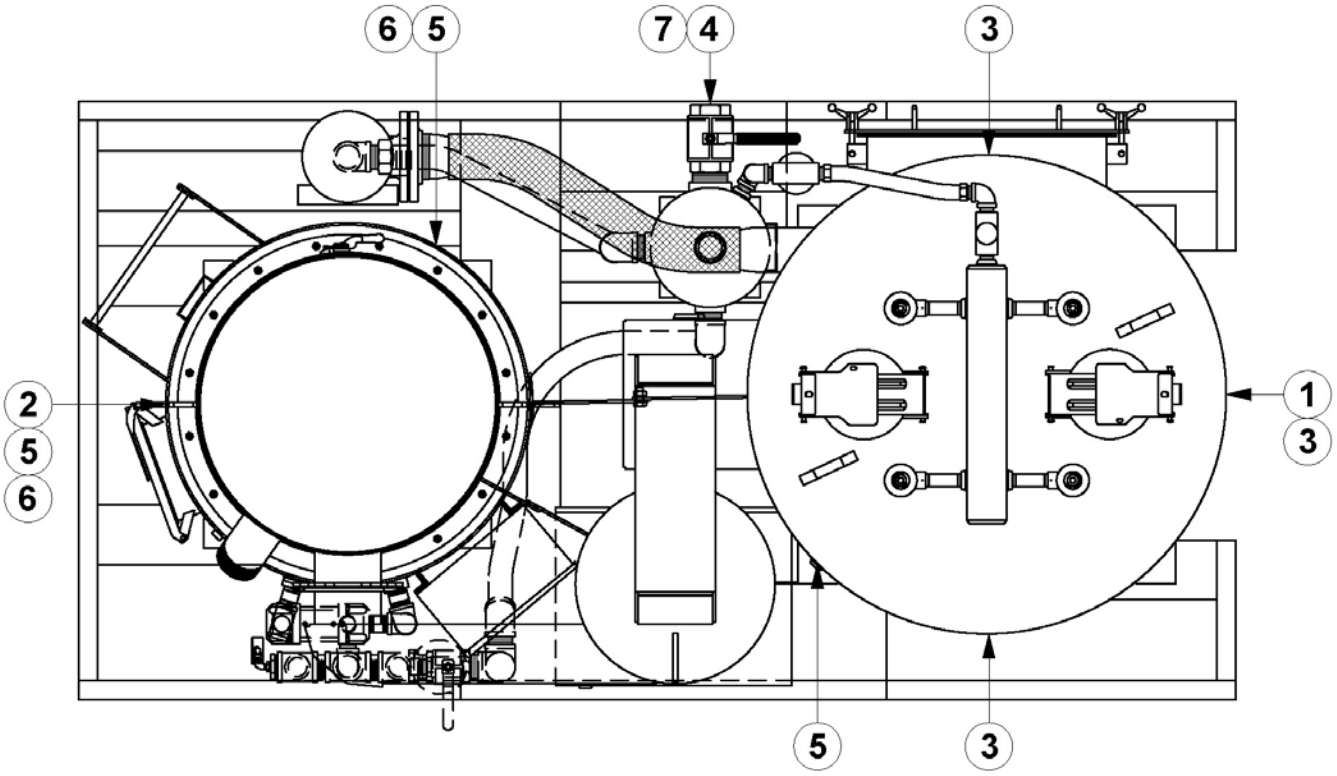


Figure 0.2(a) – Warning decal location (Top View)

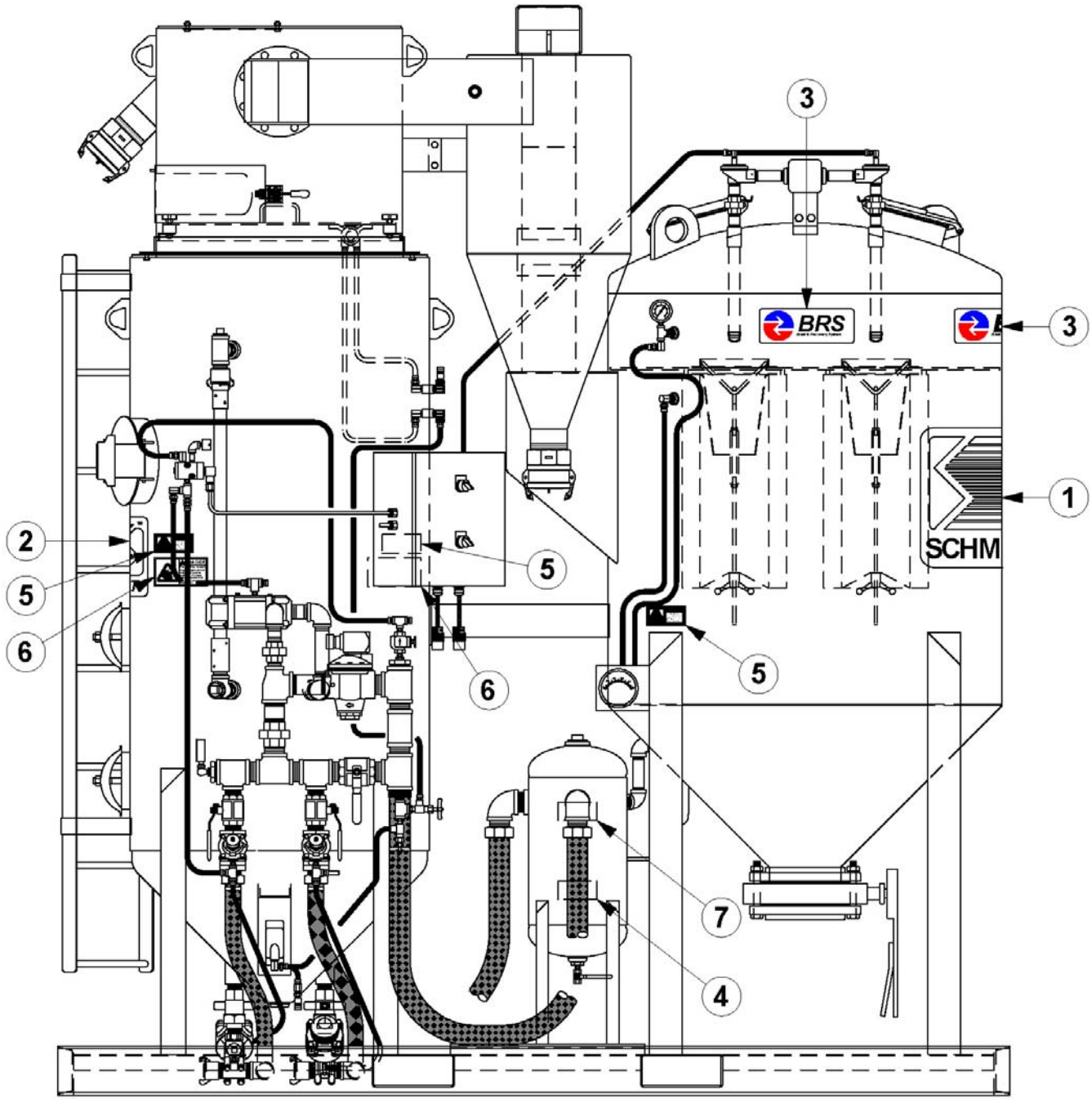


Figure 0.2(a) – Warning decal location (Side View)

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1.0 Rules for Safer Operation

1.1. GENERAL RULE FOR SAFER OPERATION.

SCHMIDT® ABRASIVE BLASTERS HAVE BEEN DESIGNED TO BE SAFE WHEN USED IN THE PROPER MANNER. ALL ABRASIVE BLASTERS ARE POTENTIALLY DANGEROUS IF ALL SAFETY PRECAUTIONS ARE NOT RIGOROUSLY FOLLOWED. PROPER TRAINING IS REQUIRED BEFORE OPERATION. PROPER PROCEDURES MUST BE FOLLOWED. THE ABRASIVE BLASTER AND ALL COMPONENTS MUST BE PROPERLY MAINTAINED. FAILURE TO OPERATE, SERVICE AND MAINTAIN THE ABRASIVE BLASTER AS SET FORTH IN THIS MANUAL MAY CAUSE INJURY OR EVEN DEATH TO ANY PERSON USING, SERVICING OR IN THE VICINITY OF THE ABRASIVE BLASTER.

THIS MANUAL IDENTIFIES POTENTIAL HAZARDS BY DANGER, WARNING, AND CAUTION SYMBOLS. HOWEVER, ALL THE RULES, PROCEDURES AND RECOMMENDATIONS MUST BE FOLLOWED. FAILURE TO OPERATE PROPERLY IS VERY LIKELY TO PLACE PERSONS AND PROPERTY AT HIGH RISK OF DAMAGE, INJURY OR EVEN DEATH.

⚠ DANGER

ABRASIVE BLASTERS AND THE ABRASIVE BLAST OPERATION ARE POTENTIALLY DANGEROUS IF ALL SAFETY PRECAUTIONS ARE NOT FOLLOWED. FAILURE TO OPERATE THE ABRASIVE BLASTER WITHOUT FOLLOWING ALL THE *RULES FOR SAFER OPERATION* MAY RESULT IN SERIOUS INJURY OR DEATH TO OPERATING PERSONNEL OR PERSONS IN THE OPERATING VICINITY.

1.2. KNOW YOUR EQUIPMENT.

Do Not operate this equipment in a manner other than its intended application (see Section 4.0). Do Not operate this equipment or any other Schmidt® equipment without following the *Rules for Safer Operation* and all the operating procedures and instructions. Learn the applications and limitations as well as the specific potential hazards related to this machine. Failure to do so could result in serious injury or death.

1.3. RECEIVE PROPER TRAINING.

Do Not operate this equipment unless you have received operational and maintenance training. Begin by thoroughly reading and understanding this operation and maintenance manual and all included information. Consult an authorized Schmidt distributor or Axxiom manufacturing, Inc.

1.4. PROTECT YOUR FEET.

Do Not operate this equipment without wearing OSHA approved foot protection. Observe all applicable local, state and federal regulations. See Section 3.10 and OSHA 29 CFR 1910.136.

⚠ CAUTION

Heavy objects can shift while being blasted and may fall on operators. Wear foot protection to prevent injury. See Section 3.10 and OSHA 29 CFR 1910.136.

1.5. PROTECT YOUR EYES.

Do Not operate this equipment without wearing OSHA approved safety glasses. Observe all applicable local, state and federal safety regulations. See Section 3.10 and OSHA 29 CFR 1910.133.

⚠ WARNING

When filling the blast vessel and during the blast operation, abrasive can be blown in the face and eyes of operators. Wear OSHA approved safety glasses. See Section 3.10 and OSHA 29 CFR 1910.133.

1.6. PROTECT YOUR LUNGS.

Do Not operate this equipment without wearing OSHA approved respiratory protection. Abrasive blasting produces dust contaminated with toxic substances from the abrasive used, the coating being removed, and the object being blasted. This dust may contain silica which can cause severe and permanent lung damage, cancer, and other serious diseases. Do Not breathe the dust. Do Not rely on your sight or smell to determine if dust is in the air. Silica and other toxic substances may be in the air without a visible dust cloud. If air-monitoring equipment for silica is not provided at the worksite, then all personnel MUST wear appropriate respiratory protection when using or servicing this equipment. Breathing air supplied to respirators must be of acceptable quality. Consult your employer and OSHA regarding the appropriate respiratory protection and breathing air quality. See Sections 3.9, 3.10, and OSHA 29 CFR 1910.134.

⚠ DANGER

Abrasive blasting produces dust which may contain silica and other toxic substances that can cause severe and permanent lung damage, cancer, and other serious diseases if inhaled. Wear OSHA approved respiratory protection. See Sections 3.9, 3.10, and OSHA 29 CFR 1910.134.

1.7. BREATHING AIR QUALITY.

Do Not use breathing air that does not meet OSHA Class D standards. Extreme caution must be taken when selecting a source of breathing air. Breathing air provided by an oil-lubricated air compressor can contain carbon monoxide; therefore, use of a carbon monoxide detector is required (See Section 3.10). Carbon monoxide can be in the compressed air produced by an oil-lubricated air compressor when it is operated at extremely high temperature; therefore, a high temperature alarm is required to alert the operators when this condition exists. See Section 3.9 and reference OSHA 29 CFR 1910.134(i).

Extreme caution must be taken when connecting to factory air sources. Factories can have sources of compressed gases such as nitrogen which is fatal if used as a breathing air source. Verify that the air source is breathable air.

⚠ DANGER

Breathing air must meet OSHA Class D standards. Use of breathing air sources that do not meet Class D standards can cause asphyxiation and result in death. Verify that all air sources are breathable quality and use a high-temperature alarm and a carbon monoxide monitor when required. See Sections 3.9, 3.10 and OSHA 29 CFR 1910.134(i).

Enclosed blast areas must be ventilated to reduce airborne dust to an acceptable level as required by OSHA 29 CFR 1910.1000.

1.8. PROTECT YOUR HEARING.

Do Not operate this equipment without wearing OSHA approved hearing protection. Observe all applicable local, state and federal safety regulations. See Section 3.10 and refer to OSHA 29 CFR 1910.95.

Loud noise is generated by the blast nozzle and the blowdown operation of this equipment. Wear OSHA approved hearing protection. See Section 3.10 and refer to OSHA 29 CFR 1910.95.

1.9. PROTECT YOUR PERSON

Abrasive blasting produces dust contaminated with toxic substances from the abrasive used, the coating being removed, and the object being blasted. All blast operators and other personnel involved in the blast operation or in the vicinity of the blast operation should wear protective clothing. The protective clothing should be disposable or washable work clothes that should be removed at the worksite so that contaminated dust is not transferred into automobiles or homes. See Section 3.10 and refer to OSHA 29 CFR 1910.94 and 1910.134.

1.10. ADHERE TO ALL REGULATIONS.

Do Not operate this equipment without observing all local, state, and federal safety regulations including, but not limited to, OSHA (Occupational Health and Safety Administration).

1.11. STAY ALERT.

Do Not operate this equipment when you are tired or fatigued. Use caution and common sense while operating and/or performing maintenance on this equipment.

1.12. DO NOT USE DRUGS, ALCOHOL, or MEDICATION.

Do Not operate this equipment while under the influence of drugs, alcohol, or any medication.

1.13. PROTECT BYSTANDERS.

Do Not allow blast equipment operators and other personnel to enter the vicinity of the blast operation without providing respiratory protective equipment that meets OSHA regulations. If dust concentration levels exceed the limitations set in OSHA 29 CFR 1910.1000 then respirators are required.

1.14. KEEP CHILDREN AND VISITORS AWAY.

Do Not allow children or other non-operating personnel to contact this equipment or the connecting hoses and cords. Keep children and non-operating personnel away from work area.

1.15. AVOID DANGEROUS ENVIRONMENTS.

Do Not operate this equipment without familiarizing yourself with the surrounding environment. The blast operation creates high level of noise which will prevent the operator from hearing other possible dangers (i.e. traffic or moving equipment). In such situations a stand-by watch person may be necessary to prevent injury to personnel.

1.16. AVOID DANGEROUS ENVIRONMENTS.

Do Not use this equipment in areas cluttered with debris. Debris in the work area can create tripping hazards which can cause the operator to loose control of the blast hose and result in injury to operating personnel. Keep work area clean and well lit. When working at an elevated location, pay attention to articles and persons below.

1.17. AVOID DANGEROUS ENVIRONMENTS.

Do Not operate this equipment in elevated areas without using fall protection equipment. Certain applications of this equipment may require the use of scaffolding. Use of scaffolding creates hazardous situations such as tripping and fall hazards which can result in serious injury or death to operating personnel. Consult OSHA 29 CFR 1910 Subpart D.

1.18. AVOID DANGEROUS ENVIRONMENTS.

Do Not blast objects that are not properly secured. The blast operation can cause the blasted object to shift or move. Extremely large objects to be blasted can create a crush hazard to operating personnel which can result in serious injury or death. Properly secure the object to be blasted.

1.19. AVOID DANGEROUS ENVIRONMENTS.

Do Not blast objects used to store flammable materials. The blast operation can cause sparks which can ignite fumes or residual flammable materials inside enclosed containers which can explode resulting in serious injury or death to operating personnel.

1.20. ELECTRICALLY GROUND EQUIPMENT.

Static electricity is generated by the abrasive flow through the blast hose. To prevent static electrical shock to operating personnel only use static dissipating blast hose and install a grounding strap on the abrasive blaster. See Section 5.14.

1.21. MAINTAIN VESSEL INTEGRITY.

Do Not operate this equipment with the pressure vessel damaged, or with any part of it worn or damaged. Do Not operate this equipment in a condition that may cause failure of the pressure vessel. See sections 1.22 through 1.31 below.

An abrasive blaster is a Pressurized Vessel. Alterations, damage, or misuse of the pressure vessel can result in rupturing. Damaged or incorrect components used on the abrasive blaster can result in rupturing. The compressed air inside a pressurized vessel contains a dangerously high level of energy which can propel objects and cause serious injury or death.

1.22. NEVER OPERATE OVER MAXIMUM WORKING PRESSURE.

Do Not operate this equipment above maximum allowable working pressure (MAWP) at maximum operating temperature (°F) shown on the ASME nameplate attached to the vessel. See Section 2.2 and 8.1.

1.23. INSTALL PRESSURE RELIEF DEVICE.

Do Not operate this equipment without a pressure relief device in place. The ASME Code requires that all vessels be equipped with pressure relief devices prior to installation. The pressure relief device must be set at the maximum allowable working pressure of the abrasive blaster. See the ASME nameplate attached to the vessel typically located above the handway. See Section 3.11 for information regarding the pressure relief valve.

1.24. NEVER OPERATE BEYOND ALLOWABLE TEMPERATURE RANGE.

Do Not operate this equipment above the maximum allowable temperature at the allowable pressure or below the minimum design metal temperature (MDMT) shown on the pressure vessel nameplate. The characteristics of the pressure vessel metal are weakened when the temperature is outside the operating range. Operating the pressure vessel outside of allowable temperature range can result in rupturing and cause serious injury or death. See Section 2.2.

1.25. ASME NAMEPLATE REQUIRED.

Do Not operate this equipment if the ASME pressure vessel nameplate is missing. Contact Axxiom Manufacturing, Inc. for technical support.

1.26. DO NOT MODIFY VESSEL.

Do Not modify or alter any abrasive blaster, blast equipment, or controls thereof without written consent from Axxiom Manufacturing, Inc. Do Not weld, grind, or sand the pressure vessel. *It will not be safe to operate.* Non-authorized modifications could lead to serious injury or death. Non-authorized modifications will void the warranty and the ASME certification.

1.27. DO NOT HAMMER ON VESSEL.

Do Not hammer on or strike any part of the pressure vessel. Hammering on the pressure vessel can create cracks and cause rupturing.

1.28. FIRE DAMAGE NOTICE.

Do Not operate if the pressure vessel has been damaged by fire. If damaged, take out of service immediately and have it inspected and/or repaired by a qualified facility. Contact Axxiom Manufacturing, Inc. for technical support.

1.29. INSPECT VESSEL REGULARLY.

Do Not operate this equipment with damage to the pressure vessel. *It is not safe*. Inspect outside and inside of the pressure vessel regularly for corrosion or damage (i.e. dents, gouges or bulges). If damaged, take out of service immediately and have it inspected and/or repaired by a qualified facility. Contact Axxiom Manufacturing, Inc. for technical support. See Section 8.0.

1.30. CHECK FOR LEAKS IN VESSEL.

Do Not operate this equipment if there is a leak in the pressure vessel. If leaking, take out of service immediately and have it inspected and/or repaired by a qualified facility. Contact Axxiom Manufacturing, Inc. for technical support.

1.31. NEVER MODIFY BLOWDOWN.

Do Not connect the blowdown on this equipment onto a common header with any other unit of any description, or any other source of compressed air, without first making sure a check valve is used between the header and this unit. Do Not install this equipment sharing piping with another unit of higher discharge pressure and capacity. A safety hazard could occur in the form of a back-flow condition.

1.32. DEPRESSURIZE VESSEL BEFORE PERFORMING MAINTENANCE.

Do Not remove, repair, or replace any item on this equipment while it is pressurized. Do Not attempt to perform maintenance or load abrasive while this equipment is pressurized or is even capable of being pressurized. This means the inlet ball valve should be closed and the air supply should be shut off or disconnected. Anytime the manual blowdown valve is closed it should be assumed that the abrasive blast vessel is pressurized.

An abrasive blaster is a Pressurized Vessel. The compressed air inside a pressurized vessel contains a dangerously high level of energy which can propel objects and cause serious injury or death. Depressurize vessel before performing any maintenance. See Section 6.2.

1.33. ALWAYS USE REMOTE CONTROLS.

Do Not sell, rent, or operate abrasive blasters without remote controls. OSHA regulations require remote controls on all abrasive blasters. All abrasive blasters must be equipped with automatic (deadman) type remote controls (either pneumatic or electric). Failure to use remote controls can cause serious injury or death to the operator(s) or other personnel in the blasting area. Reference OSHA 29 CFR 1910.244(b).

1.34. NEVER USE BLEEDER TYPE DEADMAN VALVES.

Do Not use bleeder type deadman valves on any Schmidt® abrasive blaster. The use of A-BEC, Clemco, or a similar bleeder type deadman valve can, without warning, cause unintentional start-up which can result in serious personal injury. A particle of dirt from the air hose can plug the bleed hole in the deadman valve and cause the blast outlet to turn on.

1.35. CHECK FOR DAMAGED PARTS.

Do Not use this equipment with damaged components. Damaged components can fail during operation and result in serious injury or death to operating personnel. Periodically check all valves, hoses, and fittings to see that they are in good condition. Repair any component that shows any sign of wear or leakage. See Section 8.0.

1.36. ALWAYS USE SAFETY PINS ON HOSE COUPLING CONNECTIONS.

Do Not use this equipment without hose coupling safety pins in place and hose whip checks installed on all air and blast hoses. All blast hose couplings and air hose couplings have pin holes that must be safety pinned to prevent accidental disconnections. Accidental hose disconnection can cause serious injury or death. See Section 5.17 and 8.7.

1.37. ALWAYS USE CORRECT REPLACEMENT PARTS AND ACCESSORIES.

Do Not use replacement parts or accessories that are not rated for pressures equal to or higher than the abrasive blaster operating pressure. Improper hoses and/or fittings used on, or connected to your abrasive blaster can rupture and cause serious injury or death.

Do Not use replacement parts that are not Schmidt original factory replacement parts. Non-original parts may not fit properly and can cause equipment damage and/or failure which can result in serious injury to operating personnel. Consult Axxiom Manufacturing, Inc.

Use of replacement components that are not Schmidt original factory replacement parts may result in equipment failure which can result in serious injury to operating personnel.

1.38. ALWAYS USE CORRECT PRESSURE RATED ACCESSORIES.

Do Not use air reservoirs or moisture separator tanks that are not rated for use in compressed air applications. Air reservoirs and moisture separator tanks larger than 6 inches inside diameter must have an ASME code stamp.

An air reservoir or moisture separator tank is a Pressurized Vessel. The compressed air inside a pressurized vessel contains a dangerously high level of energy which can explode propelling objects and result in serious injury or death to operating personnel. Air reservoir and moisture separator tanks must be ASME coded tanks.

1.39. NEVER AIM BLAST NOZZLE TOWARDS ANY PERSON.

Do Not aim the blast nozzle towards yourself or any person. System malfunction can cause accidental start up and result in injury to personnel.

1.40. NEVER USE ABRASIVE NOT INTENDED FOR BLAST EQUIPMENT.

Do Not use abrasive blast abrasive containing free silica. Silica can cause silicosis or other related respiratory damage. Verify that the abrasive is intended for use in blasting equipment. Personal protective equipment, including airline filters and respirators, must be used for all abrasive blasting operations. Observe all applicable local, state and federal safety regulations. See Section 3.8, 3.10 and reference OSHA 29 CFR 1910.134.

1.41. CHECK ABRASIVE FOR DEBRIS.

Do Not use blast abrasive that contains trash or other debris. Trash or debris can create a blockage and cause equipment malfunction. Screen recycled abrasive to remove trash.

1.42. STOP OPERATION IMMEDIATELY IF ANY ABNORMALITY IS DETECTED.

Do Not operate this equipment if anything abnormal is seen during operation. Stop operation immediately for inspection.

1.43. DO NOT LIFT THE BLAST VESSEL USING THE LIFT EYES.

Do Not lift the blast vessel by any point other than the fork pockets. See Section 2.6.

1.44. MAINTAIN WARNING DECALS.

Do Not remove, cover, obstruct, or paint over any warnings, cautions, or instructional material attached. Warning decals must be installed, maintained, and located to be visible and with enough light for legibility. See Section 0.0 and 8.12.

1.45. SAVE THIS OPERATION AND MAINTENANCE MANUAL.

Refer to this operation and maintenance manual as needed as well as any additional information included from other manufacturers. Never permit anyone to operate this equipment without having him/her first read this manual and receive proper training. Make this manual readily available to all operating and maintenance personnel. If the manual becomes lost or illegible replace it immediately. This operation and maintenance manual should be read periodically to maintain the highest skill level; it may prevent a serious accident.

1.46. SAFETY REFERENCES

See Section 12.4 for safety information sources and contact information. Use these sources to obtain additional information regarding all aspects of blast operation safety.

2.0 Specifications and General Information

2.1 Notes to Distributors and Owners

2.1.1. Verify that the deadman, twinline (or cords), and the operation and maintenance manual are included with the abrasive blaster when it is received. Verify that the deadman, twinline (or cords), and the operation and maintenance manual are included with the abrasive blaster when it is delivered to the purchaser.

2.1.2. This equipment is intended for knowledgeable and experienced users. No person or persons should be allowed to operate this equipment without first receiving proper training in abrasive blasting operation and use of this equipment.

2.1.3. Immediately notify Axxiom Manufacturing, Inc. of any instances of use of this equipment in any manner other than the intended application. See Section 4.0.

2.1.4. Only qualified personnel should load and unload this equipment for shipping. The blast vessel should only be lifted using the fork pockets. See the lifting diagram shown in Section 2.6.

2.1.5. For further information contact:

Axxiom Manufacturing, Inc.
11927 South Highway 6
Fresno, Texas 77545

Phone: 1-800-231-2085
Fax: 1-281-431-1717
Website: www.axxiommfg.com

2.2 BRS2 Abrasive Blaster Operational Specifications

Maximum Working Pressure	150 psig @ 250°F (see ASME nameplate)
Minimum Metal Temperature	-20°F @ 150 psig (see ASME nameplate)
Air Consumption	See Section 20 table 1
Abrasive Consumption	See Section 20 table 2
Blast Hose Size	See Section 20 table 3
Electrical requirements	See Section 3.7
Abrasive Capacity	Blast vessel: 20.0 cu ft
	Reclaim hopper: 20.0 cu ft
Vacuum System	Pneumatic Vacuum Pump (Eductor)
	550 ICFM at approx. 100 psig

2.3 Important Reference Numbers

Fill in the Abrasive Blaster model number and serial number in the blank spaces below. These will be used for reference whenever service or maintenance is required.

Blaster Model Number_____

Blaster Serial Number_____National Board Number_____

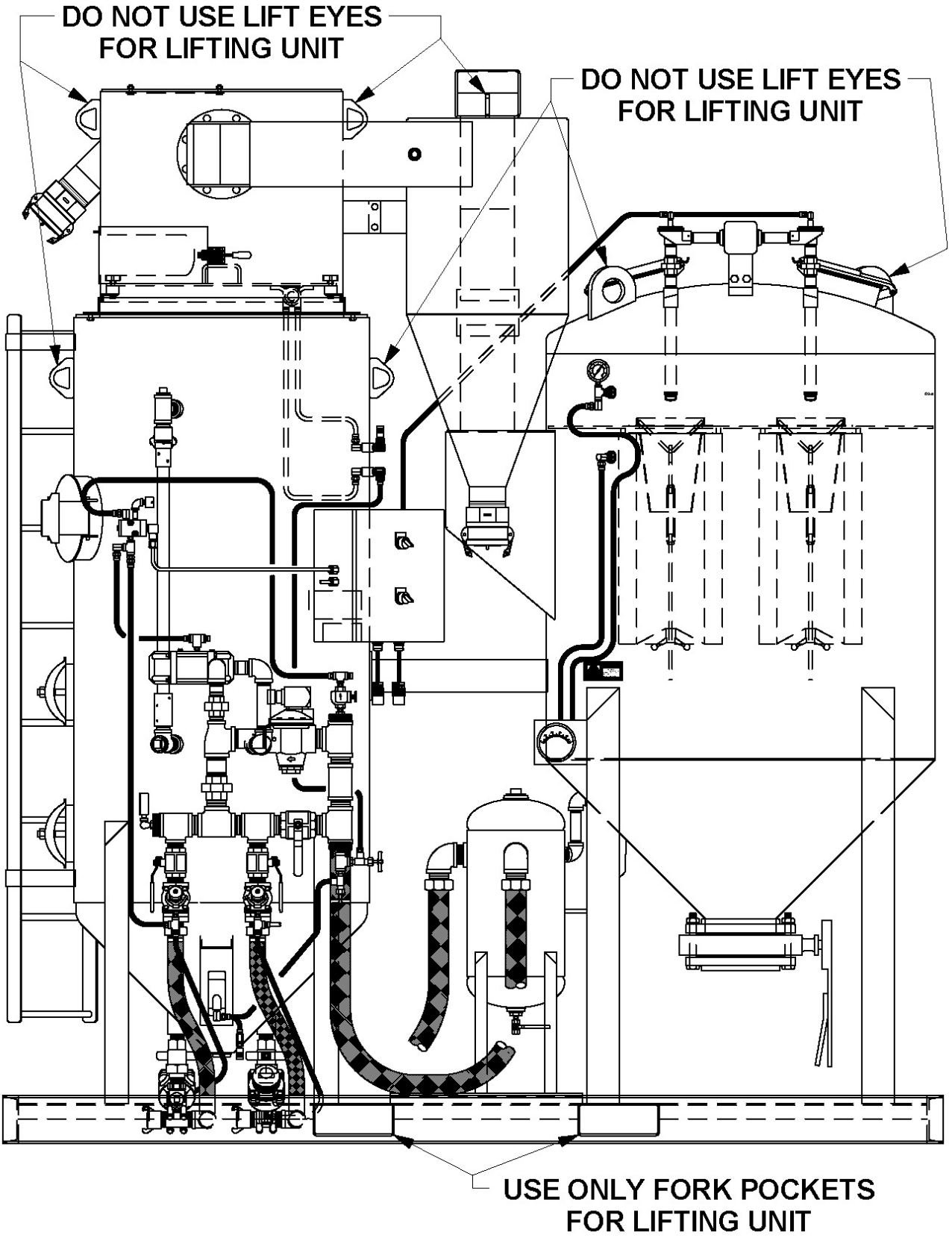
2.4 Vessel Information

2.4.1. All pressure vessels used in Schmidt® Abrasive Blasters are manufactured in strict accordance with the provisions of the ASME Code Section VIII, Div. 1 and are registered with the National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229. Should Manufacturer's Data Reports be required they may be obtained from the National Board for a small fee.

2.4.2. In order to maintain the high level of quality and quality control used in the manufacture of this vessel, it is required that any and all welded repairs to this vessel be performed by a reputable shop holding a National Board "R" Stamp and/or an ASME "U" stamp, depending on state or city law. Welding on the vessel performed by welders not properly qualified per the ASME Code voids the ASME/NB integrity of that particular vessel.

2.5 Notes

2.6 BRS2 Abrasive Blaster Lifting Diagram



3.0 Installation Requirements and Personal Protective Equipment

Carefully read and follow all the recommendations regarding the abrasive blast system installation requirements. Improper installation can result in equipment malfunction and significant lost time expenses. Consult an authorized Schmidt® distributor or Axxiom Manufacturing, Inc.

3.1 Abrasive Blast System Installation Location

Units that will be installed in permanent locations require careful consideration. Stationary units can be installed below an abrasive hopper with a support structure that can limit access to the abrasive blast system. Install stationary blast systems in a position that will allow access to the handway(s) and the blaster piping. These areas must be accessible to perform required maintenance.

3.2 Compressed Air Requirements (blast nozzle)

The blast nozzle size and blast pressure determines the compressed air requirements. Available air flow capacity and/or air compressor size must be considered before selecting the blast nozzle size. An air source dedicated to the abrasive blast system is preferred to reduce system pressure drops and back flow of air. If an existing air compressor will be used or a limited air supply is available, then the blast nozzle must be selected based on these conditions. Be aware that as the blast nozzle wears the air demand will increase. See Table 1 in Section 13.0 for air consumption by nozzle size at various pressures. **NOTE:** BRS2 systems can be upgraded to two blast outlets and therefore this option should be considered when determining compressed air requirements.

3.3 Air Compressor Size

Air compressor size is crucial to the operation of the abrasive blast system. Blast nozzle selection and desired productivity must be evaluated to determine the air flow requirements prior to selecting the air compressor size. Sufficient air supply capacity is necessary to maintain the system air pressure. Insufficient air flow capacity will result in reduced blast nozzle pressure and lost productivity. The air compressor must be large enough to supply:

i. The sum of blast air requirements for each nozzle at the highest pressure that will be used (see Section 13.0, Table 1).

ii. The 12 CFM breathing air supplied to each blast operator respirator. **NOTE**: Reference OSHA regulations regarding requirements for breathing air, especially when an oil-lubricated air compressor is used.

3.4 Blast System Air Supply Line

The air supply hose and fittings must be rated at a minimum of 150 psi operating pressure. The air supply hose from the air compressor to the blast unit should be at least the same diameter as the air inlet piping (see Section 9.0). This size hose will be large enough to supply the required airflow to operate the blast unit controls and each blast nozzle. See Sections 5.2 and 5.17 for further information on air hose connection. **NOTE:** If the abrasive blast system will be installed in a permanent location, the inlet connection can be hard piped. Do Not install hard piping that is smaller than the piping size of the blast system. Smaller piping size will reduce the air flow capacity. If other equipment will be using the same source of air as the abrasive blaster, install a check valve at the air inlet. This will prevent air pressure back flow, which will carry abrasive into the blast control system.

3.5 Blast System Air Pressure

The maximum allowable working pressure (MAWP) for the blast unit is stamped on the ASME nameplate attached to the vessel. For most abrasive blast systems the MAWP is 150psig. Do Not exceed the MAWP. An air pressure regulator can be installed to reduce air supply pressure that is higher than the MAWP. To prevent air pressure backflow only use a non-relieving air regulator. Air pressure backflow will carry abrasive from the blast vessel and contaminate the blast control system. **CRITICAL**: A regulator with sufficient air flow capacity must be selected for proper operation of the blast system. Insufficient air flow capacity will cause pressure drop in the blast system resulting in equipment malfunction, abrasive backflow, and reduced blast productivity.

The BRS2 System is equipped with an air pressure regulator that allows the option of blasting at low pressure. When blasting at low pressure the air supply to the deadman blast control system must be at least 80psig (see Figure 5.5 and 5.6). The valves in the abrasive blast system are “spring closed” and therefore require at least 80psig to operate properly. The air supply to the blast controls is taken upstream of the regulator to maintain the control air pressure at the inlet pressure.

3.6 Blast System Air Quality

Air quality is crucial to the operation of an abrasive blaster. Moisture and contaminants can cause components to malfunction. Moisture condensation in a blast system causes abrasive flow problems. Condensation occurs when the hot vapor-filled compressed air cools as it reaches the abrasive blaster. Water droplets formed during condensation can be absorbed by the abrasive in the blast vessel and prevent it from flowing out of the abrasive valve. Therefore, a moisture removal device installed for the blast system air supply is recommended (i.e. coalescing moisture separator, air-cooled aftercooler or deliquescent dryer). Contact a local authorized Schmidt® distributor or Axxiom Manufacturing, Inc. to locate one near you.

3.7 Electrical Requirements

The BRS2 Blast System vacuum system electrical requirement is 120Vac with a maximum of 4 amps current. The electric control system is operated on 120Vac for pulse controls with 12Vdc internal transformer for the blast controls. See Section 9.0 for the electrical schematic.

Consult local electric codes for requirements for the electrical connection to the BRS2 Blast system. The electrical connection to the BRS2 Blast system must be completed by a qualified electrician.

⚠ DANGER

Electric shock hazard. The BRS2 vacuum system operates on a dangerous high voltage. Contact with electric system and cause serious injury or death. Disable the electric power prior to performing any maintenance. Service and maintenance must be performed by a qualified electrician.

3.8 Abrasive Selection

Abrasive selection is likely the most difficult decision related to the blast operation. Choice of abrasive is based on factors such as blast application type, desired finish, coating requirements, characteristics of object to be blasted, cost, ability to recycle, available equipment, safety, and environmental constraints.

There are many abrasives available that are either natural, manufactured, or processing by-products. Abrasives are available in varying sizes, shapes, and hardness. These characteristics determine the resulting effect on the surface to be blasted and limitations of its use. The effects on the blasted surface are measured by its degree of cleanliness and the surface profile. Standards and required levels of these measurements are established by organizations such as Steel Structures Painting Council (SSPC), National Association of Corrosion Engineers (NACE) and coating manufacturers. See Section 12.5 for contact information of these organizations. Use these sources to obtain information regarding all aspects of surface preparation and abrasive selection guidelines.

The Thompson Valve and Micro Valve abrasive blasters are designed for high production open abrasive blasting with a wide range of abrasives. It is the responsibility of the employer and operators to select the proper abrasive. It is the responsibility of the employer to make certain that the abrasive selected is safe to use for abrasive blasting.

CRITICAL: Always obtain the Material Safety Data Sheet (MSDS) for the abrasive to be used. The MSDS provides the chemical makeup of the abrasive. Do Not use abrasives containing toxic materials. Refer to OSHA 29 CFR for acceptable limits of various toxic substances and additional measures to be taken to protect operating personnel. Always use abrasives containing less than 1% of crystalline silica. Always use a NIOSH approved respirator when handling, loading and cleaning up abrasives. Organic substances which are combustible may only be used in automated blast systems with ventilation that meets OSHA 29 CFR 1910.94.

3.9 Breathing Air Quality

All blast operators must be supplied with and required to use NIOSH approved air-fed respirators. Breathing air supplied to these respirators must meet Grade D air quality standards as specified by OSHA 29 CFR 1910.134(i) and the Compressed Gas Association Specifications ANSI/CGA G-7.1. Consult these specifications when selecting a source of breathing air.

Breathing air must be clean, dry, contaminant-free, and provided at a pressure and volume specified by NIOSH. Use NIOSH approved air filters on all sources of breathing air. See Section 3.10

Breathing air filters do not remove carbon monoxide or any other toxic gases. Use a carbon monoxide monitor to detect unacceptable levels. Consult OSHA 29 CFR 1910.134(i).

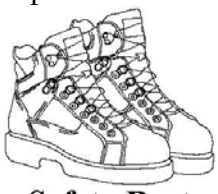
Many sources of breathing air are available such as air cylinders, free-air pumps, oil-less air compressors, and oil lubricated air compressors. The most commonly used is the same air compressor that is used for the blast air which most often is oil lubricated. Breathing air provided by an oil-lubricated air compressor can contain carbon monoxide and therefore requires the use of a carbon monoxide detector (See Section 3.10). Carbon monoxide can be in the compressed air produced by an oil-lubricated air compressor when it is operated at extremely high temperature; therefore, a high temperature alarm is required to alert the operators when this condition exists.

Oil lubricated air compressors can produce carbon monoxide. Carbon monoxide can cause asphyxiation and result in death. Use a high-temperature alarm and a carbon monoxide monitor when an oil lubricated air compressor is used to supply breathing air. Consult OSHA 29 CFR 1910.134(i).

3.10 Personal Protective Equipment (PPE)

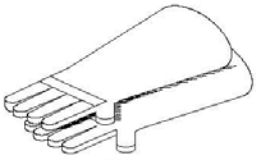
Abrasive blasting has many hazards that may cause injuries to operators. To protect operators from injury each must be supplied with and required to use Personal Protective Equipment. The Occupational Health and Safety Administration (OSHA) requires the employer to assess the workplace to determine what PPE is necessary and supplied to each operator (Reference 29 CFR 1910 Subpart I). OSHA requires that this equipment meet or be equivalent to standards developed by the American National Standards Institute (ANSI). Figure 3.1 below identifies the minimum personal protective equipment required for each abrasive blast operator. Also identified are the OSHA references for each and the ANSI standard each PPE item must meet. All PPE clothing and equipment should be selected for safe design and quality of construction. Select each for proper fit and for comfort which will encourage operator use.

Safety Glasses
Reference OSHA 29 CFR 1910.133
Must meet ANSI Z87.1 - 1989

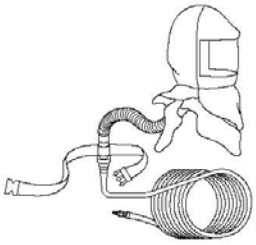


Safety Boots
Reference OSHA 29 CFR 1910.136
Must meet ANSI Z41.1 - 1991

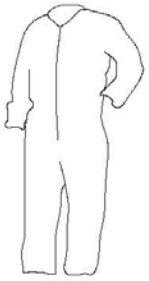
Ear Plugs
Reference OSHA 29 CFR 1926.101
Must meet ANSI S3.19
(Also see OSHA 29 CFR 1910.95)



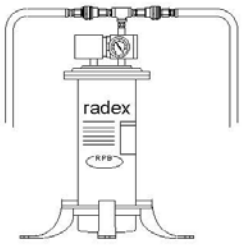
Gloves
Reference OSHA 29 CFR 1910.138
No Applicable ANSI Standard



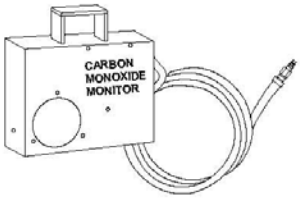
Respirator
Reference OSHA 29 CFR 1910.134
Must be NIOSH approved



Protective Clothing
Reference OSHA 29 CFR 1910.138
No Applicable ANSI Standard



Airline Filter
Reference OSHA 29 CFR 1910.134
Must be NIOSH approved



Carbon Monoxide Monitor

Figure 3.1 - Personal Protective Equipment

3.11 Pressure Relief Valve Installation

Do Not operate this equipment without a pressure relief device installed to protect the blaster pressure vessel from over-pressurization. The ASME Code requires that all vessels be operated with pressure relief devices in place.

Local regulations set the specifications for pressure relief valves; therefore it is the responsibility of the owner of the abrasive blaster to install a pressure relief valve that meets *all* applicable regulations. The pressure relief device must be set at the maximum allowable working pressure of the abrasive blaster pressure vessel. See the ASME vessel nameplate attached to the pressure vessel.

4.0 Abrasive Blast System General Operation

The function of the Schmidt® abrasive blaster is to provide a mixture of dry abrasive and compressed air to a blast nozzle. The abrasive blast stream through the blast nozzle is used for removing rust, paint, or other unwanted surface defects. After abrasive blasting, the surface is ready for new paint or coating.

The BRS2 Abrasive Blaster is one of a group of components used in an abrasive blasting job. The typical components are an air compressor, moisture removal device, an abrasive blaster, blast hose, a blast nozzle, operator personal protective equipment, and blast abrasive. See Figure 4.1.

The blast abrasive is loaded into the abrasive blaster through a top fill port. All the compressed air must be removed from inside the abrasive blaster before it can be filled with abrasive. The abrasive can be bag loaded, or loaded from a Schmidt storage hopper. To begin blasting, the fill port is closed and the abrasive blaster is filled with compressed air from the air compressor. Since moisture creates problems in the blast operation, it is common for the compressed air to be fed through a moisture removal device, such as a Schmidt AirPrep System. The air pressure in the abrasive blast vessel is equal to the air pressure in the blast hose where it connects at the Thompson Valve. This equal pressure is needed to allow the blast abrasive to flow downward by gravity. The abrasive flow is controlled by the metering valve at the bottom of the blaster. At this point, the blast abrasive flows into the blast air stream and through the blast hose. The speed of blast air and abrasive mixture is greatly increased by the blast nozzle onto the work surface. The high speed of the air and abrasive is what gives it the energy to blast rust and paint off of surfaces. The abrasive blast stream and the dust it creates are harmful; therefore all blast operators must use personal protective equipment during the blast operation.

All the components required for the blast operation (except for the air compressor) are available from Axxiom Manufacturing, Inc. Call Axxiom to locate a distributor.

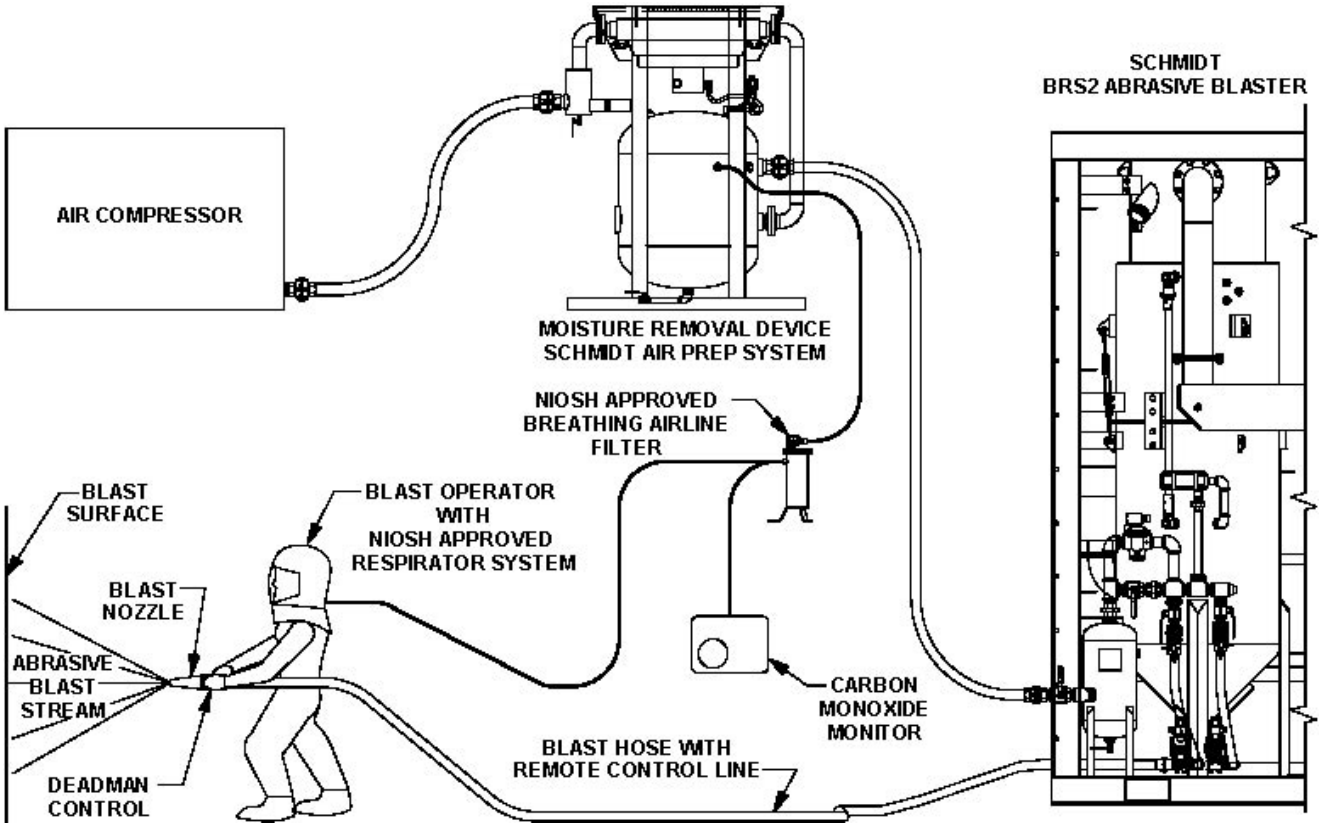


Figure 4.1 – Typical BRS2 Abrasive Blast System

5.0 BRS2 Abrasive Blast System General Operation

See Figure 5.1 below to help understand the general operation of the BRS2 abrasive blaster. Do not attempt to operate the abrasive blaster before reading all sections of this manual and following all setup procedures. See Sections 5.1 through 5.24 and Section 6.0.

The function of the BRS2 unit is to blast and recover abrasive media. The BRS2 is designed to blast using one or two outlets, vacuum abrasive independently, or blast and vacuum simultaneously. The abrasive is contained in the pressure vessel (#36) for blasting. After or during the blast operation the abrasive is recovered in the reclaim hopper (#37) using a vacuum system. Small particles are carried by the vacuum air stream through the reclaimer, through the secondary cyclone (#38), and then into the dust collector (#39). The reusable abrasive is retained in the abrasive reclaimer and drops to the bottom of the reclaim hopper. Large particles (paint chips, cigarette butts, etc) are trapped by the abrasive screen (#21). When the blast vessel is depressurized the abrasive is reloaded from the reclaim hopper.

This recycling of the abrasive can be repeated several times depending on the type of abrasive used. After each cycle of the abrasive the particle become smaller and eventually will be carried through the reclaim system and into the dust collector (#39). The dust collector filters the vacuum air and traps the waste dust for disposal.

The BRS2 abrasive blaster (#36) is a depressurized system; meaning the blaster will pressurize only when the Combo Valve® is opened by pressing the deadman lever (#17).

Compressed air enters the blast system when the air inlet ball valve (#1) is opened. Air flows through the moisture separator (#2) and into the blast piping and the supply side of the Combo Valve (#8). When the deadman lever (#17) is pressed down signal air will flow back to open the Combo Valve and the automatic air valve (#12). When the Combo Valve opens air will flow into the blast vessel internal piping. The air flow pushes the popup (#10) against the gasket (#9) to seal the abrasive inlet and allow the air flow to pressurize the blast vessel (#36). See Figure 5.2.

Blasting starts when the deadman lever (#17) is pressed down opening the combo valve (#8) and the automatic air valve (#12). Compressed air will flow from the blaster piping to the blast hose (#49) and out through the blast nozzle (#48). The choke ball valve (#11) and the abrasive shutoff valve (#13) must be open during the blast operation. Abrasive will flow through the Thompson Valve® (#14) and fall into the blast air stream. The abrasive flow can be increased or decreased by turning the knob on top of the Thompson Valve (#14). Because of the length of the blast hose it will take a few seconds to see changes in abrasive flow.

Blasting stops when the deadman lever (#17) is released. This will close the automatic air valve (#12) and the Combo Valve (#8) and depressurize the vessel at the same time. The compressed air in the abrasive blaster will exhaust through the blowdown hose (#7) into the reclaim hopper (#37).

The BRS2 Abrasive Blast System is equipped with two independent blast outlets. Each blast outlet will pressurize the abrasive blast vessel when the corresponding deadman lever (#17) is pressed down. Each blast outlet operates as described above.

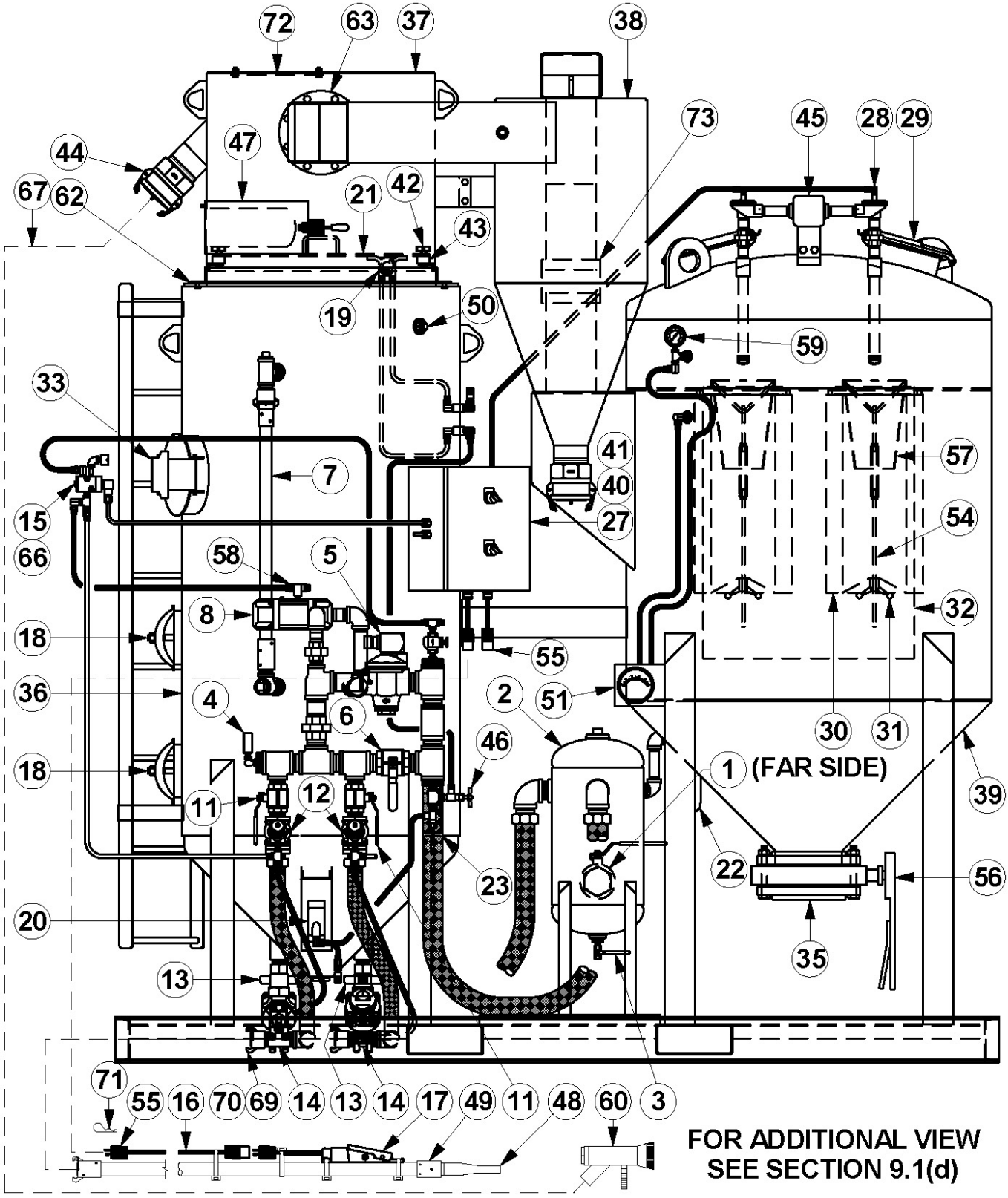


Figure 5.1 – Typical BRS2 Abrasive Blaster

5.1 Popup Valve (abrasive inlet)

The blaster is filled with abrasive through the abrasive inlet at the top of the pressure vessel. The abrasive inlet is automatically sealed by the popup head (#10) when the blaster is pressurized. The air flow into the internal piping pushes the popup (#10) up against the gasket (#9). See Figure 5.2.

⚠ WARNING

Pinch point hazard. Vessel pressurization will close the popup. Keep fingers clear of the popup opening. Disconnect air supply prior to performing popup maintenance.

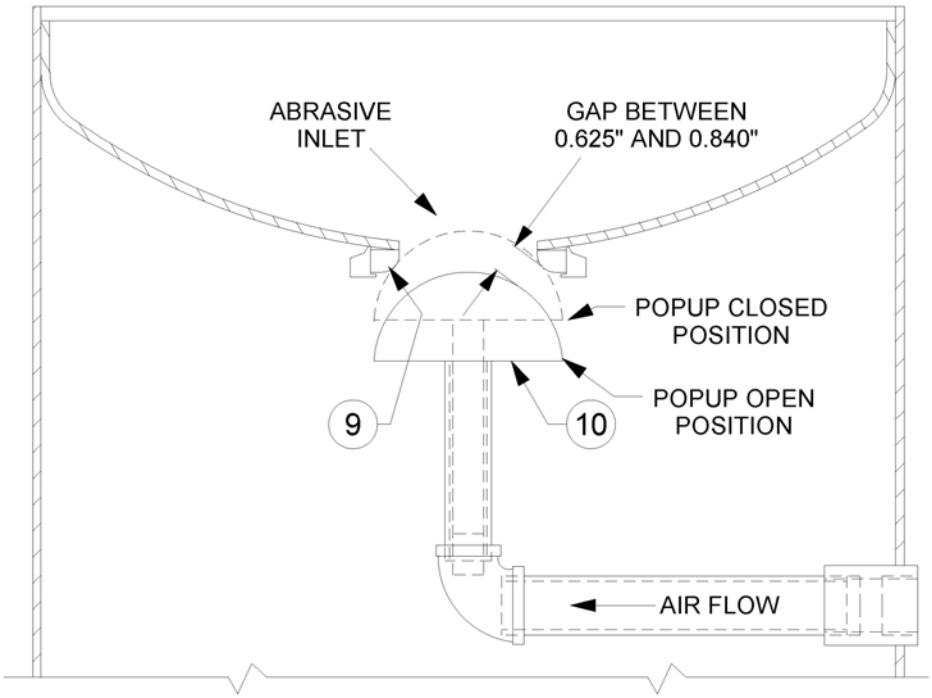


Figure 5.2 – Standard Popup Assembly

5.2 Air Supply Connection

Air is supplied to the abrasive blaster through a hose connection at the air inlet crowfoot (#65). The air supply hose connected to the abrasive blaster must be same diameter as the air supply piping and rated at a minimum of 150psi operating pressure. See the drawings and parts lists in Section 9.0 and refer to Sections 3.4 and 5.17.

5.3 Air Inlet Ball Valve

The air inlet ball valve (#1) is used to turn on and turn off the air flow to the abrasive blaster. When the inlet ball valve is opened air will flow through the moisture separator (#2) and into the Combo Valve® (#8). In the BRS2 depressurized system the blast vessel *does not* pressurize when the inlet ball valve is opened.

5.4 Moisture Separator

Air flow into the BRS2 Blast System passes through the moisture separator (#2) which removes moisture, oil and dirt particles from the inlet air. The water that is removed by the separator is drained by opening the ball valve (#3) at the bottom of the separator. This ball valve should be left slightly opened anytime the blaster is in operation. This allows water to be drained as it is filtered from the blast air.

5.5 Regulated Tank/Blast Pressure Control

The BRS2 Blast System is equipped with an air pressure regulator (#5). The blast vessel and blast air pressure are both adjusted by the air pressure regulator. Reducing the blast air pressure is necessary when blasting objects that are fragile. The pressure is adjusted by turning the knob on top of the regulator valve body (CW-increases pressure, CCW-decreases pressure). The tank/blast pressure is shown by the pressure gauge (#4). The bypass ball valve (#6) must be closed to use the regulated air pressure piping. **Note:** The air pressure regulator (#5) is non-relieving which means that when the pressure is decreased by turning the knob, the blast vessel air pressure *will not* reduce on the pressure gauge. The pressure will reduce only while blasting. The non-relieving feature prevents air from flowing backwards from the blast vessel to the regulator which would carry abrasive.

5.6 Full Pressure Bypass

The bypass piping is a detour of the regulated air supply to provide full line pressure to the blast vessel and blast air line. This allows blasting at full pressure for tougher applications without changing the setting of the air pressure regulator (#5). Open ball valve (#6) to bypass the pressure regulator and allow blasting at full air pressure. Then close the ball valve (#6) to resume using the regulated pressure control.

5.7 Combo Valve® (blast vessel pressurization/blowdown)

The Combo Valve (#8) is a dual purpose valve that controls both the blast vessel pressurization and the blast operations. At one end the valve pinches the 3/4" blowdown hose (#7) to seal it and allow air to pressurize the blast vessel. At the other end the Combo Valve opens and allows air to flow to the blast vessel (#36) and through the blast air piping to the blast nozzle.

The Combo Valve opens and blasting starts when the deadman lever (#17) is pressed down. The blast vessel will pressurize.

The Combo Valve closes and blasting stops when the deadman lever (#17) is released.
The blast vessel will depressurize (blowdown).

When the Combo Valve closes the pinch ram on the blowdown hose (#7) is released and the air inside the blast vessel (#36) will exhaust through the blowdown hose. The blast vessel (#36) remains depressurized when the Combo Valve (#8) is closed. The abrasive blaster must be depressurized before filling with abrasive or before performing any maintenance. (See section 9.4)

Note: The combo valve blowdown hose (#7) is connected to the reclaim hopper (#37) therefore; the blast vessel exhaust air will vent into the reclaim hopper.

The BRS2 abrasive blaster is a pressurized vessel. Propelled objects will cause serious injury or death. Read and follow all pre-operation and operating procedures prior to pressurizing the abrasive blaster. See Section 6.0 and 7.0.

Airborne particles and loud noise hazards from blowdown exhaust air can cause serious injury and loss of hearing. Wear approved eye and ear protection. Stay clear of blowdown air path. DO NOT place hands or other body parts in the blowdown air path. Make sure no personnel are in the blowdown air path. Do Not disconnect the blowdown hose (#7) from the reclaim hopper (#37).

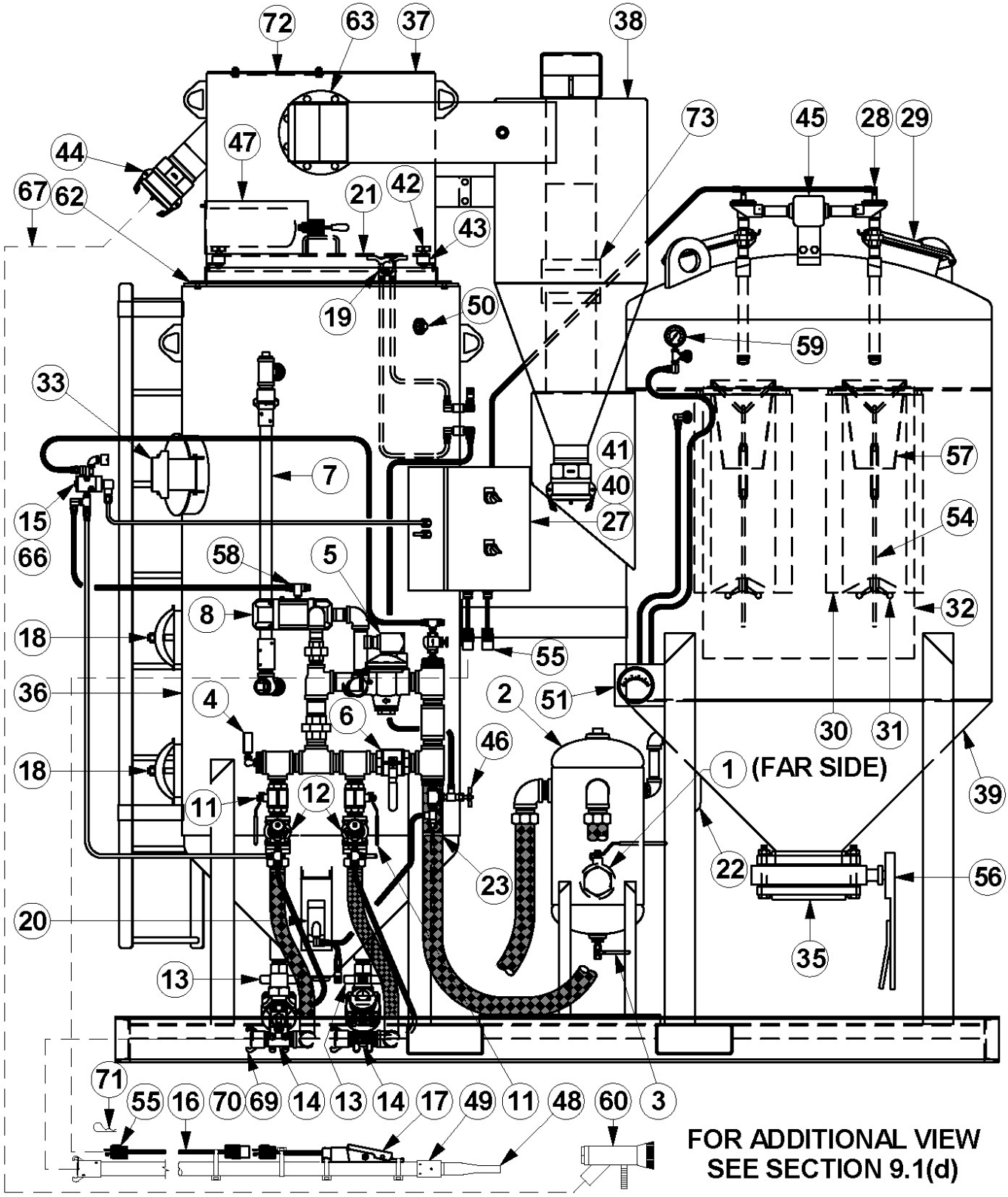


Figure 5.3 – Typical BRS2 Abrasive Blaster

5.8 Choke Valve

The choke valve (#11) is a ball valve located in the blast air line upstream of the Thompson Valve®. The choke valve is used to clear any trash that may get into the blast vessel and block the Thompson Valve orifice. Whenever trash (paint chip, cigarette butt, etc.) blocks the Thompson Valve orifice the procedure is to fully open the Thompson Valve knob, then press down the deadman lever (#17) to begin blasting. While blasting, have an assistant close the choke valve completely for about one second. This creates differential pressure at the Thompson Valve (high pressure above; low pressure below). The higher pressure from the blast vessel should be enough to loosen the trash blocking the Thompson Valve orifice and blast it through the blast nozzle (#48). To prevent excess wear of the Thompson Valve keep the choke valve fully open during normal blasting. **Note:** If the BRS2 abrasive blaster is equipped with the abrasive cut-off feature set the cut-off valve (or switch) to the on-position for the choke procedure. See Section 9.10.

Do not aim blast nozzle towards yourself or any person. System malfunction can cause accidental start up and result in injury to personnel.

A secondary purpose of the choke valve is as a manual shut off valve for the blast air supply. When the choke valve (#11) is closed it will shut off the blast air supply to the blast outlet.

5.9 Automatic Air Valve

The automatic air valve (#12) is a normally closed valve that opens to supply blast air to the blast hose and blast nozzle (#49 & #48). The automatic air valve opens when it receives air to its signal port. This happens when the deadman lever (#17) is pressed down which opens the blast control valve (#15) sending an air signal to the automatic air valve. When the deadman lever is released, the air signal from the blast control valve vents and the automatic air valve spring closes to stop blast air flow to the blast hose and nozzle. See Section 9.7.

5.10 Thompson Valve®

The Thompson Valve (#14) is a dual-purpose valve. First, it is a normally closed valve that opens to supply abrasive into the blast air stream. The Thompson Valve opens when it receives air to its signal port (See Section 9.5). This happens when the deadman lever (#17) is pressed down which opens the blast control valve (#15) sending an air signal to the Thompson Valve. When the deadman lever is released, the air signal from the blast control valve vents and Thompson Valve spring closes to stop abrasive flow to the blast hose and nozzle (#49 & #48).

Secondly, the Thompson Valve® (#14) is an abrasive metering valve. When the Thompson Valve is open the abrasive flow is metered (controlled) by an adjustable orifice. The amount this orifice opens is controlled by turning the knob at the top of the Thompson Valve. The knob sets the stopping point of the plunger (See Section 9.5). Turn the knob clockwise to reduce the orifice size and decrease the abrasive flow. Turn the knob counter-clockwise to increase the orifice size which will increase the abrasive flow to the blast nozzle (#48). The Thompson Valve spring retainer has lines on the side to use as reference points to the amount that the orifice is open. Adjustments to the abrasive flow should be made by turning the knob a little at a time. Test the adjustment by starting the blast for a short period to determine if further adjustment is needed.

The Thompson Valve II has a built in cleanout port where a ball valve can be installed (see Section 9.5). This ball valve can be used to purge (blow out) trash that blocks abrasive flow.

This is done by closing the union ball valve (#13), opening the clean out valve, and then pressing down the deadman lever (#17). The blast air flows through the Thompson Valve® and purges any trash through the clean out valve. **Note:** If the abrasive blaster is equipped with the abrasive cut-off feature set the cut-off valve (or switch) to the on-position for the Thompson Valve to open for purging. See Sections 9.10.

⚠ WARNING

Airborne particles and loud noise hazards from the purged air can cause serious injury and loss of hearing. Wear approved eye and ear protection. Stay clear of the purged air path. DO NOT place hands or other body parts in the purged air path. Make sure no personnel are in the purged air path.

5.11 Union End Ball Valve (media shutoff)

The union ball valve (#13) is used to block the abrasive flow to the Thompson Valve®. This allows the user to remove the Thompson Valve from the blast vessel without emptying the abrasive. Turn the union ball valve handle to the horizontal position to block abrasive flow. Loosen the nut to separate the two sections of the union ball valve and remove the Thompson Valve from blast vessel. The handle on the union ball valve can be difficult to turn; however, there are punched holes at each arm of the handle where a standard ratchet wrench can be inserted and used as leverage to open or close the valve (see Figure 5.4).

⚠ DANGER

The BRS2 abrasive blaster is a Pressurized Vessel. Propelled objects will cause serious injury or death. Depressurize vessel before performing any maintenance. See Section 6.2.

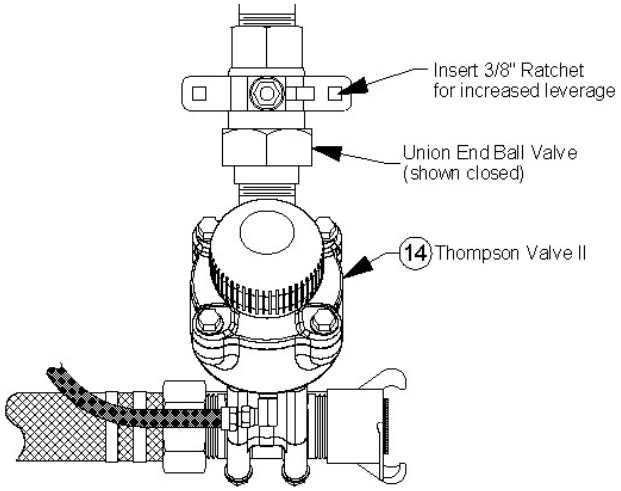


Figure 5.4 – Union End Ball Valve

5.12 Deadman Valve/Switch

The Deadman valve/switch is part of a system that controls the blast operation. The deadman valve/switch (#17) allows the operator to remotely start and stop the blast operation. The Deadman is mounted at the end of the blast hose assembly (#49) close to the blast nozzle (#48) to give the operator easy control of the blast operation. The Deadman is either a pneumatic valve or an electric switch depending on the type of abrasive blaster control system. When the deadman lever is pressed down it sends either a pneumatic or electric signal to the blast control valve (#15). The control valve opens and sends an air signal to the Combo Valve® (#8), the automatic air valve (#12) and the Thompson Valve (#14). See Sections 9.1, 9.2 and 9.8.

Depressing the deadman lever (#17) will start the blast operation.

Releasing the deadman lever (#17) will stop the blast operation.

5.12.1. Pneumatic Deadman System: When the pneumatic deadman lever (#17) is pressed down air supply from the orange hose of the twinline hose (#16) flows into the black hose. Air flows through the black hose to the signal port of the control valve (#15) causing it to open and send air signals to the Combo Valve® (#8), the automatic air valve (#12), and the Thompson Valve® (#14). When the deadman lever is released the air signal is cut off and the remaining air vents from the breather vent (#66). See Figure 5.5 and the drawings in Section 9.1.

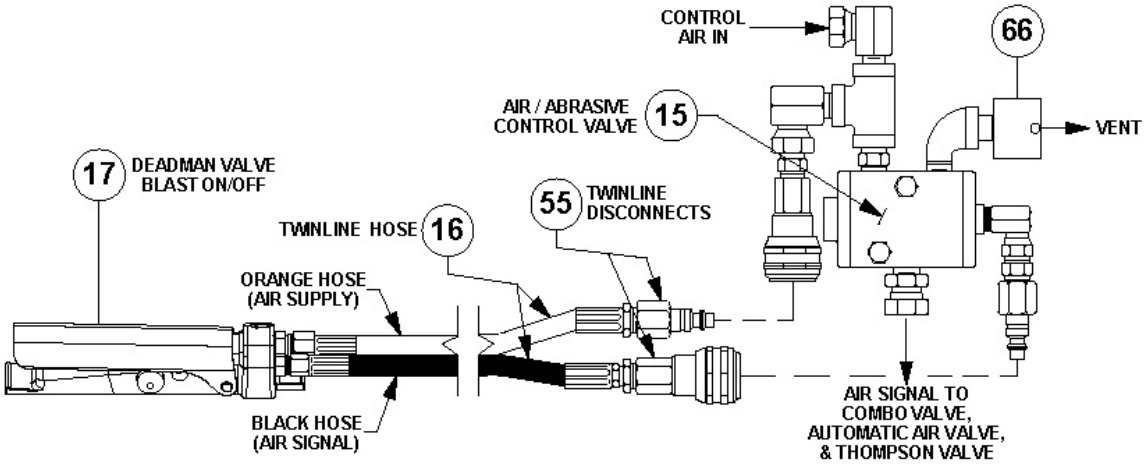


Figure 5.5 – Pneumatic Blast Control System

5.12.2. Electric Deadman System: When the electric deadman lever is pressed down it closes the electric circuit and supplies electric current to the control valve (#15). The control valve opens and sends air signals to the automatic air valve (#12) and the Thompson Valve® (#14). When the deadman lever is released the electric circuit is cut off closing the control valve. The signal air vents from the breather (#66). See Figure 5.6.

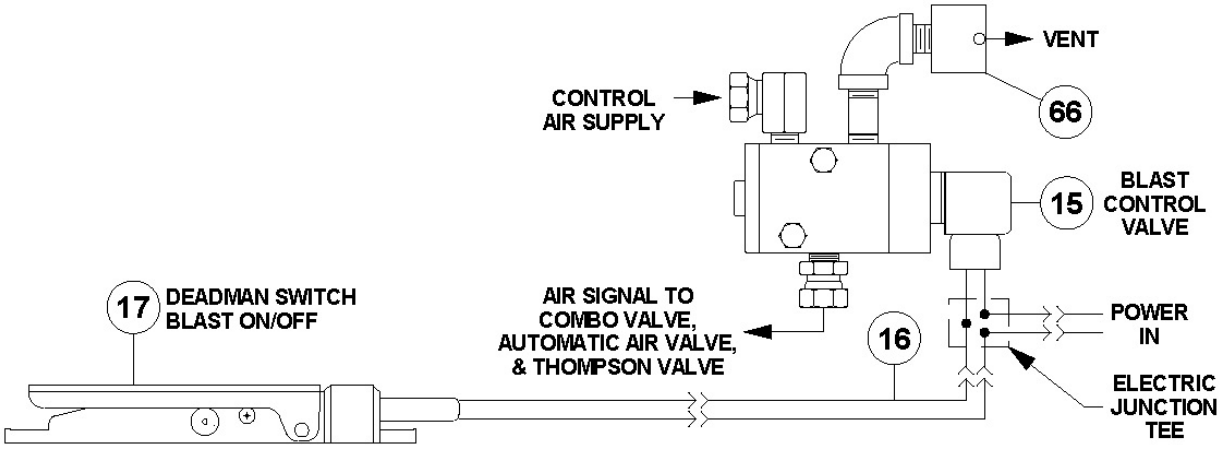


Figure 5.6 – Electric Blast Control System

5.13 Abrasive Cut-Off (optional)

An optional feature of a blaster is an abrasive cut-off. The purpose of the abrasive cut-off is to allow blasting air without abrasive. This is useful for blowing off abrasive from the blasted item. To blast with air only set the abrasive cut-off valve (or switch) to the off-position then press down the deadman lever (#17). This will send a control signal to the automatic air valve only, therefore only blast air will exit the blast nozzle (#48). For the abrasive cut-off to work a second control valve is needed that provides a signal to the Thompson Valve® separate of the air signal to the automatic air valve. Refer to the drawings in Section 9.10.

Note: The abrasive cutoff feature can be added to existing systems. Contact an Axxiom distributor for conversion kit information.

5.14 Blast Hose

The blast air/abrasive mixture flows from the Thompson Valve® to the blast nozzle (#48) through the blast hose assembly (#49). The typical length of the blast hose is 50ft; however blast hose extensions can be added for longer lengths. For higher efficiency keep the blast hose as short as possible. Increased blast hose length causes pressure drop at the blast nozzle which reduces the blast efficiency. For higher efficiency use a blast hose with an inside diameter that is three times the nozzle throat diameter. Keep blast hose as straight as possible. Sharp bends create high wear points. Static electricity is generated by the abrasive flow through the blast hose. To prevent static electrical shock to operating personnel only use static dissipating blast hose and install a grounding strap on the abrasive blaster.

5.15 Blast Nozzle

The blast nozzle (#48) is an important part of the blast operation since the nozzle size determines the air flow and abrasive requirement. The amount of air flow and abrasive determine how quick blasting can be done. The larger the nozzle, the greater the amount of air and abrasive will be needed. The larger the nozzle size the greater the blast productivity. However, for a fixed amount of air supply, increasing the nozzle size will reduce the blast pressure. For best performance the blast pressure must be maintained as high as possible. Therefore, select the nozzle size based on the amount of air available and then adjust the abrasive flow at the Thompson Valve® accordingly.

The nozzle size can be identified by a small number visible on the outside. This number represents the nozzle throat diameter in sixteenths of an inch; for example, a #5 nozzle has a throat diameter of 5/16". See the tables in section 13.0 for approximate air and abrasive consumption for each nozzle. **Note:** For the best possible mixture of air to abrasive, the blast hose and piping must be at least three times the size of the blast nozzle.

The best nozzle size for a particular application can be determined by several factors:

i. How much compressed air is available? Refer to section 13.1, table 1 for the approximate air consumption for each size blast nozzle

ii. Will blasting be done open cycle (w/o vacuum recovery) or closed cycle (w/simultaneous vacuum recovery)? When closed blasting, the blast air flow must not be greater than the vacuum pump (#26) capacity. This will prevent blast air and dust from blowing out around the nozzle brushes on the BRS vacuum head (#60). The recommended blast nozzle size to be used in closed blasting varies depending on the length and diameter of the vacuum hose. Use the following general guidelines for reference:

BLAST PRESSURE	NOZZLE SIZE
15 psi or less	#7 Nozzle
30 psi or less	#6 Nozzle
50 psi or less	#5 Nozzle
100 psi or less	#4 Nozzle

Open blasting (w/o vacuum recovery) can be done with any size nozzle, but for higher production a #8 (1/2") nozzle is most commonly used.

iii. What type of surface is being blasted? Blasting small or intricate parts is usually done with a smaller nozzle.

5.16 BRS Vacuum Head (optional)

The BRS vacuum head (#60) is an optional accessory used when operating in the closed blasting mode (blasting with simultaneous vacuum recovery). The blast abrasive is contained within the vacuum head where from it is recovered by the vacuum system. The blast nozzle (#48) screws into the nozzle holder (#49) of the blast hose assembly, which in turn fits into the BRS vacuum head (#60). Then the suction hose attaches to the side of the vacuum head. The vacuum hose to BRS head is usually a tight fit, so no further seal is required at that joint. All other joints in the vacuum line are sealed with hose clamps. The BRS is equipped with brushes and a center wear tube that attach to the working end of the head (see Figure 5.7 and Section 9.9). The brushes and center tube are wear components and should be inspected and replaced periodically. When operating in the closed blasting mode requiring the use of a vacuum head assembly, it is important to remember that this limits the size of blast nozzle (#48) that can be used due to limitations created by the blast head and the available compressed air volume. Refer to Sections 3.0 and 13.1 to determine compressed air requirements.

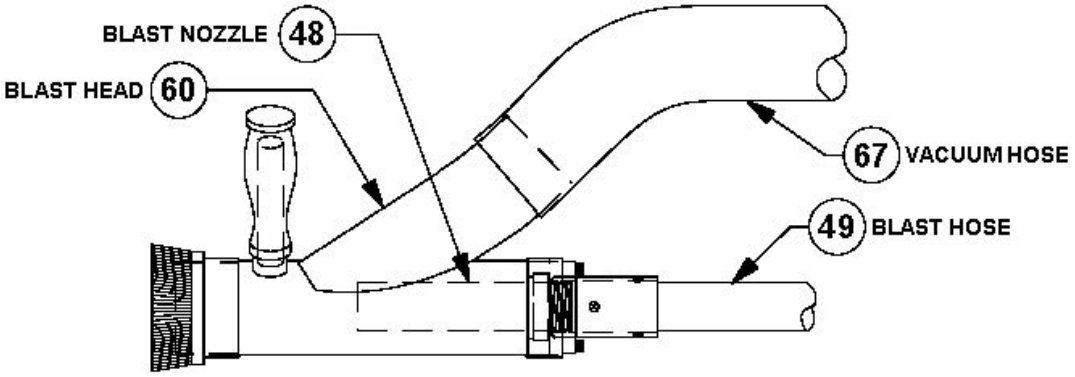


Figure 5.7 – Hose Connection Disconnect Protection

5.17 Hose Connection

All air hose, blast hose, and threaded couplings have pin holes that align when connected. To prevent accidental hose disconnections safety pins must be installed through these holes. As a secondary safety measure each hose connection should also include a hose whip check that will hold the hose if there is an accidental disconnection. Connect one loop to each side of the connection and stretch out as shown in Figure 5.8 below. All air hose, blast hose, and threaded couplings have a gasket that seals the connection and should be replaced when air is leaking.

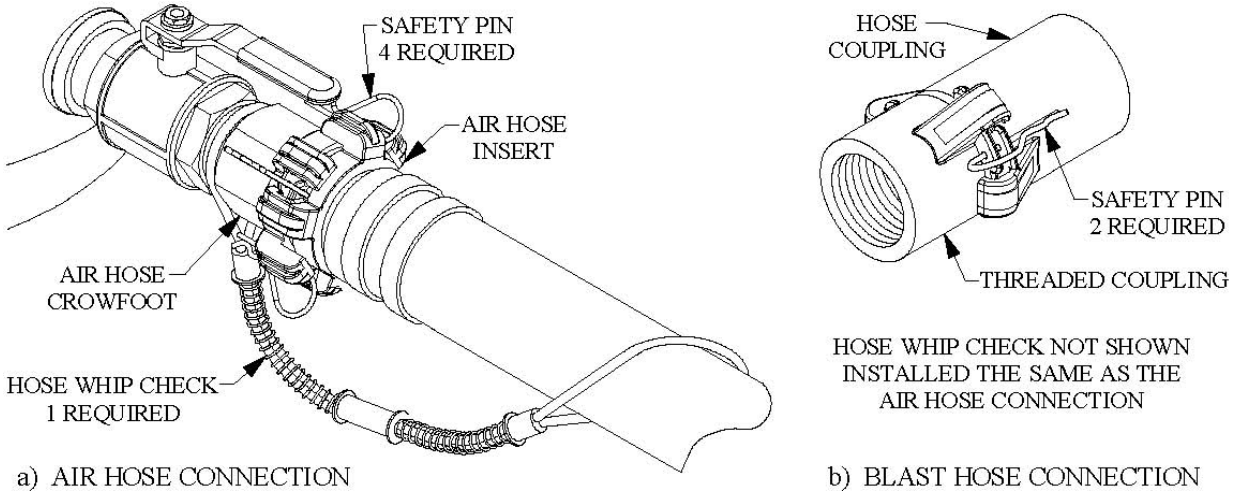


Figure 5.8 – Hose Connection Disconnect Protection

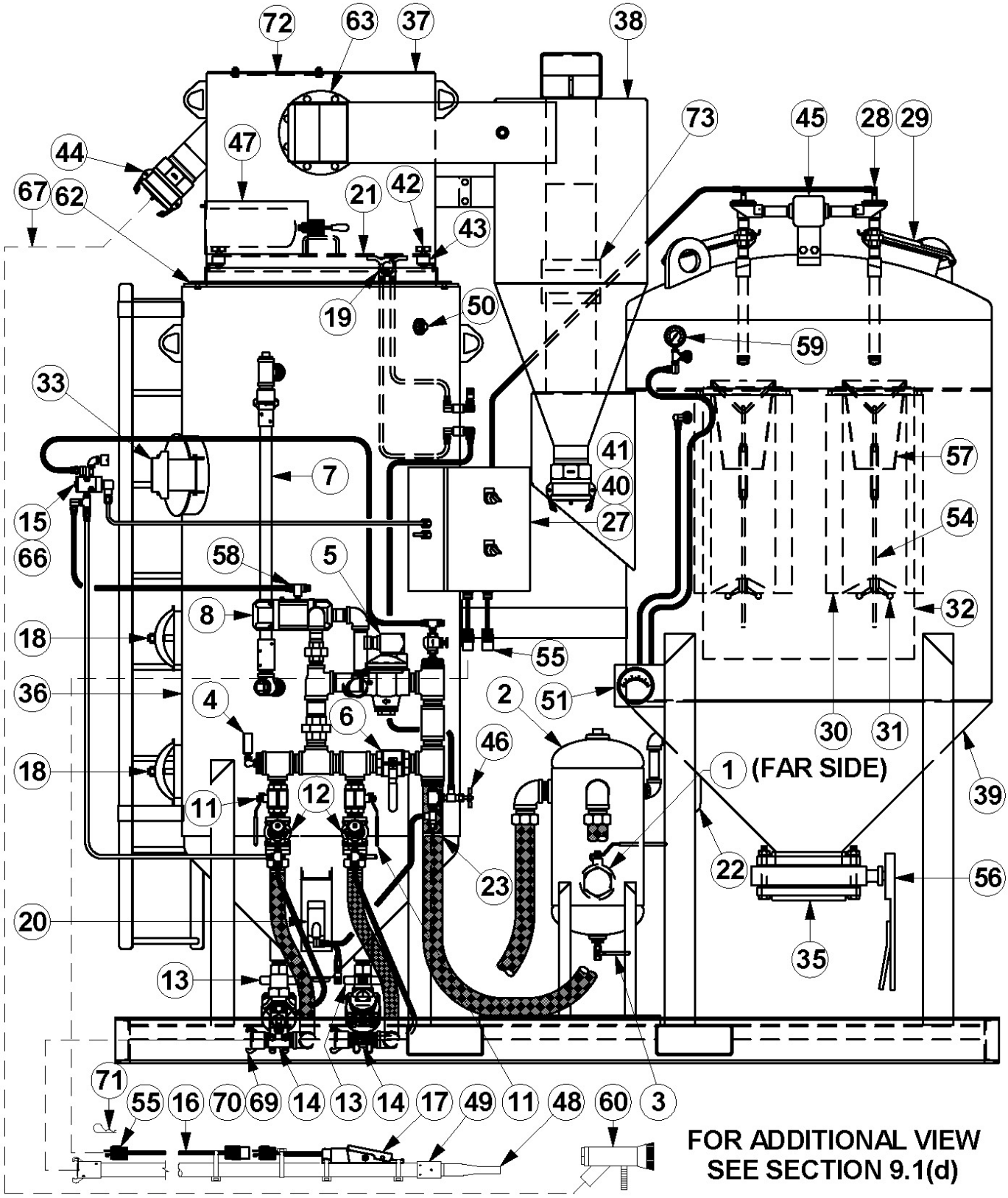


Figure 5.9 – Typical BRS2 Abrasive Blaster

5.18 Vacuum system

The vacuum system is used for abrasive recovery during closed blasting (simultaneous blasting and recovery), or to vacuum recover abrasive at completion of open blasting. The main component of the vacuum system is the pneumatic vacuum pump (#26). The vacuum pump is powered by a minimum of 550 CFM of compressed air at 100 psig. The vacuum system is activated by opening the ball valve (#74) located below the vacuum pump. The vacuum generated by the vacuum pump can be regulated by the supply ball valve (#74). When the vacuum system is activated the vacuum pressure is indicated on the pressure gauge (#59) located on the dust collector (#39). The vacuum system exhausts air through a muffler (#75).

Pneumatic Vacuum Pump System Sequence of Operation (see figure 5.10):

a) Turn "Main Power" switch to "on" position to activate power system.
b) Turn "Automatic Pulse" switch to "on" position to start dust collector filter pulse jet system.
c) Open supply ball valve (#74) to begin vacuum.
d) Vacuum load abrasive into reclaim hopper (#37).
e) Close supply ball valve (#74) to stop vacuum.
f) Turn "Automatic Pulse" switch to "off" position to stop dust collector filter pulse jet system.
g) Turn "Main Power" switch to "off" position to power down system.

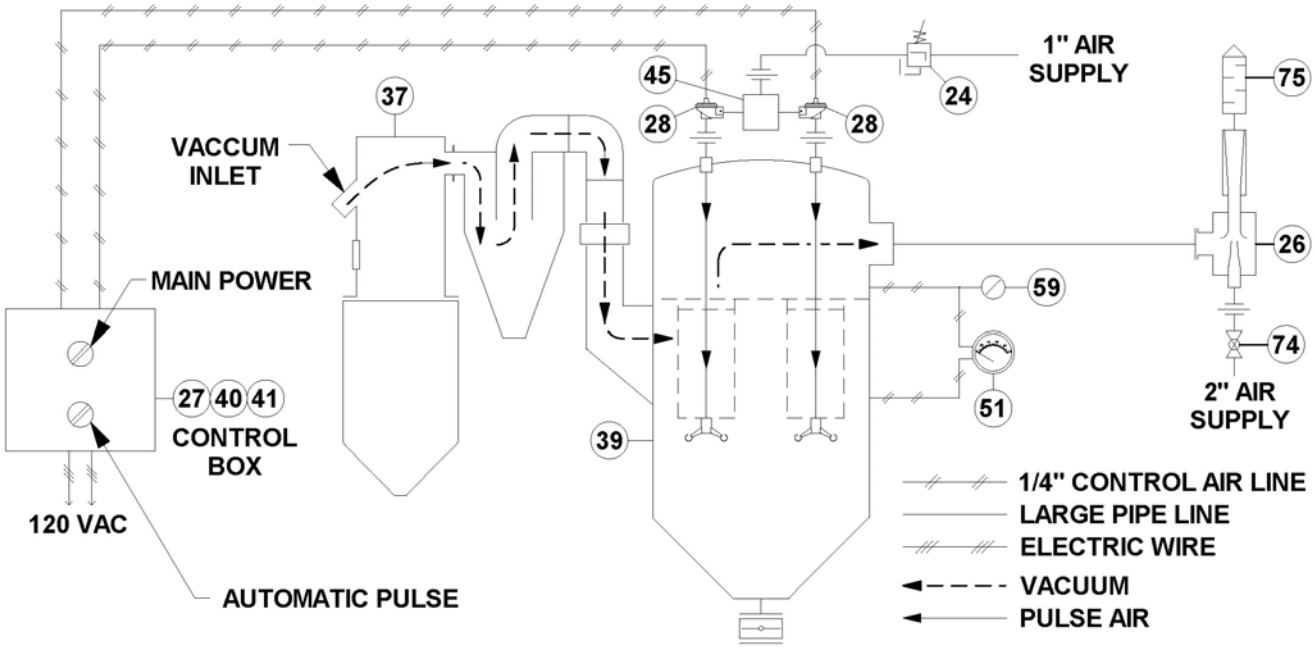


Figure 5.10 – Pneumatic Vacuum Pump System

5.19 Abrasive Reclaim Hopper

The function of the abrasive reclaim hopper (#37) is to receive the abrasive recovered by vacuuming. The abrasive and other debris enter the abrasive reclaimer at the inlet (#44). Large heavier particles fall to the bottom of the abrasive reclaimer. Small lighter particles remain in the air stream and are carried from the abrasive reclaimer into the secondary cyclone (#38) then to the dust collector (#39). There is an abrasive screen (#21) inside the reclaimer that prevents debris (paint chips, cigarette butts, etc.) from passing into the pressure vessel (#36). When blasting is interrupted and the pressure vessel is depressurized, the popup valve (#10) opens which allows the abrasive accumulated in the reclaimer to fall through the screen and enter the pressure vessel. The screen should be inspected and cleaned periodically. It can be accessed through the access door (#47) of the abrasive reclaimer.

5.20 Secondary Cyclone

The function of the secondary cyclone (#38) is to provide additional separation of dust particles prior to entering the dust collector. This separation of large and small dust particles will extend the life of the dust collector filters (#30). The air/dust flow enters the cyclone at the tangential inlet. As it enters the velocity is reduced causing the heavier particles to drop out of the air stream and down to the bottom of the cyclone. The cyclone empties into a 1.5 cu. ft dust drum (#34, optional) which must be periodically emptied.

5.21 Dust collector

The dust-filled vacuum air stream from the secondary cyclone enters the dust collector (#39) where the dust particles are filtered out by the four pleated filter elements (#30). The filters are held in position by a winged knob (#31) which seals it against the bottom of the tube sheet in the dust collector. The air filters can be accessed for removal or inspection through the door (#32). To remove the filters, loosen the winged knob to lower it so it can be unhooked at the end of the turnbuckle (#54). The filters must be pulsed regularly during operation to prevent clogging (see Section 5.22). The dust collector filters must be periodically cleaned to insure long life (see Section 8.17). Filters requiring maintenance or clogged filters will be apparent by an elevated differential pressure reading on the gauge (#51) connected to the dust collector.

The clean vacuum air stream is evacuated from the dust collector through the pneumatic vacuum pump (#26). The dust removed from the air stream collects at the bottom of the dust collector cone. The dust can be drained by opening the butterfly valve (#56). Periodically open the butterfly valve (#56) to drain the accumulated dust.

Abrasive blasting produces dust which may contain Silica and other toxic substances that can cause severe and permanent lung damage, cancer, and other serious diseases if inhaled. Wear OSHA approved respiratory protection when opening the dust collector and/or the dust drum. See Sections 3.8, 3.10, and OSHA 29 CFR 1910.134.

5.22 Pulse Jet System

The function of the pulse jet system is to prevent clogging of the dry filters (#30) by periodically providing a burst of air inside the filter to loosen dust particles from the pleated surface. The periodic bursts of air are provided by the automatic pulse jet controls. The required interval between pulses is determined by the blasting conditions. As the particles begin to clog the filter the differential pressure across the dust collector tube sheet will increase. This increase can be detected on the pressure gauge (#51). The pulsing air supply utilizes a reservoir (#45) to prevent pressure drops at the blast nozzle. Each pulse line contains a pneumatically operated pulse valve (#28). Each pulse valve is opened by an air signal from the pulse control valves (#41) in the BRS2 system control box (#27). Refer to the drawings in Section 9.0.

5.22.1 Automatic pulse jet controls

The automatic pulse system provides operator-free pulsing of the air filters and operates continuously when activated. The automatic pulse is controlled by an electronic circuit board (#40) located in the BRS2 system control box (#27) (refer to drawing in section 9.0). Upstream of the pulse air reservoir is an air filter (#22) and an adjustable air regulator (#24), which are installed to maintain the clean air, of a maximum of 80 psig, required by the pulse controls. The pulse air control box sends a signal to the pulse air valve (#28), via the pulse control valve (#41), which opens providing the burst of air necessary to unclog the air filters (#30). The adjustment of the pulse air control box is dictated by the blasting conditions. The interval between pulses can be changed by adjusting the "OFF TIME" on the pulse timer board (#40). To adjust the "OFF TIME", press the select button located on the upper right corner of the timer board until the "OFF TIME" LED is illuminated, then press the adjust button located to the left of the select button until the required time is displayed on the digital readout. The "OFF TIME" is adjustable from 1 to 180 seconds in 1 second increments. The pulse length can be changed by adjusting the "ON TIME". To adjust the "ON TIME", press the select button until the "ON TIME" LED is illuminated, then press the adjust button until the required time is displayed on the digital readout. The "ON TIME" is adjustable from 30 to 350 milliseconds in 5 millisecond increments. The pulse effect can be seen by a decrease in the vacuum reading on the pressure gauge (#51). The automatic pulse jet controls can be disabled by turning the switch on the front of the control box to the "OFF" position. **Caution:** An excessive "On Time" will cause the pulse air to overpower the vacuum resulting in reduced abrasive recovery capabilities.

5.23 Abrasive Vibrator (vessel)

The function of the abrasive vibrator (#20) is to vibrate the abrasive in the pressure vessel (#36) to improve flow. The level of vibration is controlled by the angle valve (#23), which can also turn off the vibration.

5.24 Abrasive Vibrator (reclaim hopper screen)

The abrasive reclaimer is equipped with a screen mounted vibrator (#19) to increase flow through the screen. The level of vibration is controlled by the angle valve (#46), which can also turn off the vibration. The vibrator can be accessed through the access door (#47).

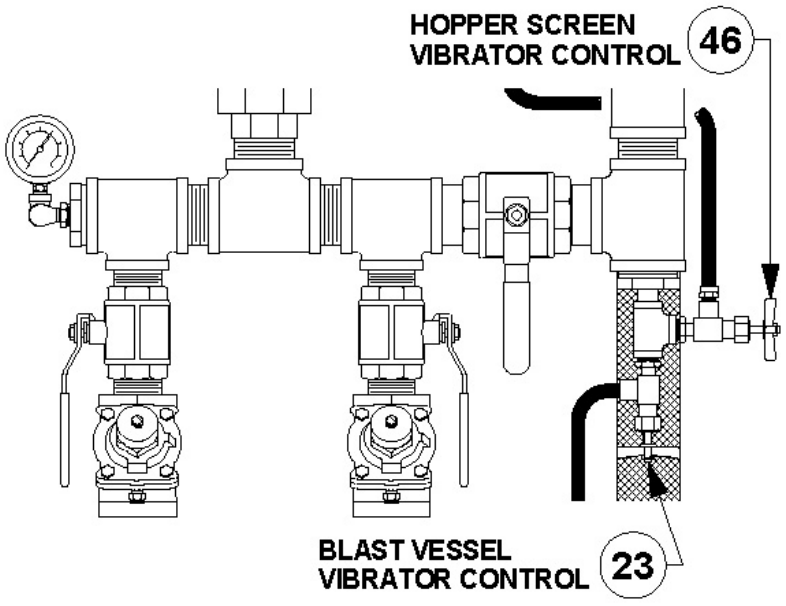


Figure 5.10 – Hose Connection Disconnect Protection

6.0 Pre-operation Procedures

⚠ DANGER

Failure to follow the procedures below could result in serious injury or death. In addition to these procedures, completely read and understand all sections of this *BRS2 Abrasive Blaster Operation and Maintenance Manual.*

6.1 BRS2 Abrasive Blaster Setup Procedure (see Figure 6.1)

6.1.1. Static electricity is generated by the abrasive flow through the blast hose. To prevent static electrical shock to operating personnel only use static dissipating blast hose and install a grounding strap on the abrasive blaster.

6.1.2. Do Not operate this equipment without a pressure relief device in place. The ASME Code requires that all vessels be operated with pressure relief devices.

Local regulations set the specifications for pressure relief valves; therefore it is the responsibility of the owner of the BRS2 abrasive blaster to install a pressure relief valve that meets *all* applicable regulations. Refer to Section 3.11 for information regarding the air pressure relief valve.

6.1.3. Verify that all required personal protective equipment is available for each operator and in good operating condition (safety glasses, safety shoes, ear plugs, gloves, airline filter, respirator, & carbon monoxide monitor). ***Critical:*** *Adhere to all local, state, and federal regulations including, but not limited to, OSHA (Occupational Health and Safety Administration). Pay close attention to requirements regarding breathing air quality. When an oil-lubricated air compressor is used, additional requirements for a high temperature alarm and/or a carbon monoxide monitor become necessary. See Sections 3.9 and 3.10.*

⚠ WARNING

Failure to use personal protective equipment could result in serious injury or death.

6.1.4. Close the air inlet ball valve (#1), blast vessel vibrator valve (#23), screen vibrator valve (#46), choke ball valve (#11), abrasive shut-off valve (#13), and turn the power switch and the pulse control switch on control box (#27) to the “OFF” position.

6.1.5. Open the butterfly valve (#56) at the bottom of the dust collector (#39) to drain the collected dust. Tightly close butterfly valve (#56).

6.1.6. Empty the 1.5 cu.ft. dust drum (#34) below the secondary cyclone (#38) and reseal.

⚠ DANGER

Abrasive blasting produces dust which may contain Silica and other toxic substances that can cause severe and permanent lung damage, cancer, and other serious diseases if inhaled. Wear OSHA approved respiratory protection when opening the dust collector and/or the dust drum. See Sections 3.8, 3.10, and OSHA 29 CFR 1910.134.

6.1.7. Check that the dust collector filters (#30) are in place and in good condition.

6.1.8. Properly install the vessel handways (#18) (see Section 6.3). Check that the reclaim hopper doors (#33 and #47), and the dust collector door (#32) are closed and tightened.

6.1.9. Hose clamp the deadman (#17) onto the blast hose assembly in a comfortable position behind the nozzle holder. Then tie wrap the twinline hose or electric deadman extension cords to the blast hose (#49).

6.1.10. Screw nozzle (#48) into the nozzle holder at end of the blast hose assembly (#49).

6.1.11. Connect the blast hose coupling to the threaded coupling (#69) on the Thompson Valve (#14). Then install safety pins and a hose whip check to prevent accidental disconnections during operation. See Section 5.17 and 8.7.

⚠ WARNING

Failure to install safety pins on all blast hose couplings could result in serious injury or death. See Section 5.17 and 8.7.

6.1.12. Connect the twinline hose quick disconnects (#55) or the electric deadman extension cords to the mating disconnects on the BRS2 abrasive blaster piping.

Be sure that each twinline is connected to the control valve disconnects (#15), automatic air valve (#12), and Thompson Valve® (#14) that supply the blast hose (#49) attached to it. If the blaster has electric controls, each must be connected to the matching junction box pigtail. See the drawings in Section 9.1 and 9.2. Close all choke valves (#11) and abrasive shut-off valves (#13) then check that all connections are correct by pressing down each deadman lever to test.

⚠ WARNING

On abrasive blasters with multiple outlets care must be taken while connecting the twinline hoses or electric deadman extension cords so not to cross connect them. Each must be connected to the matching blast outlet control. Cross connecting will result in unintentional blast startup and could result in serious injury or death.

6.1.13. Connect a 150 psi rated (minimum) air supply hose to the air inlet crowfoot (#65) and install safety pins and a hose whip check to prevent accidental disconnections during operation. See Section 5.17 and 8.7.

⚠ WARNING

Failure to install safety pins on all air hose couplings could result in serious injury or death. See Section 5.17 and 8.7.

6.1.14. Confirm that the electric power is connected to the BRS2 blast system by turning the control box main power switch to the “on” position. The power on indicator light will turn on.

⚠ DANGER

Electric shock hazard. The BRS2 vacuum system operates on a dangerous high voltage. Contact with electric system and cause serious injury or death. Disable the electric power prior to performing any maintenance. Service and maintenance must be performed by a qualified electrician.

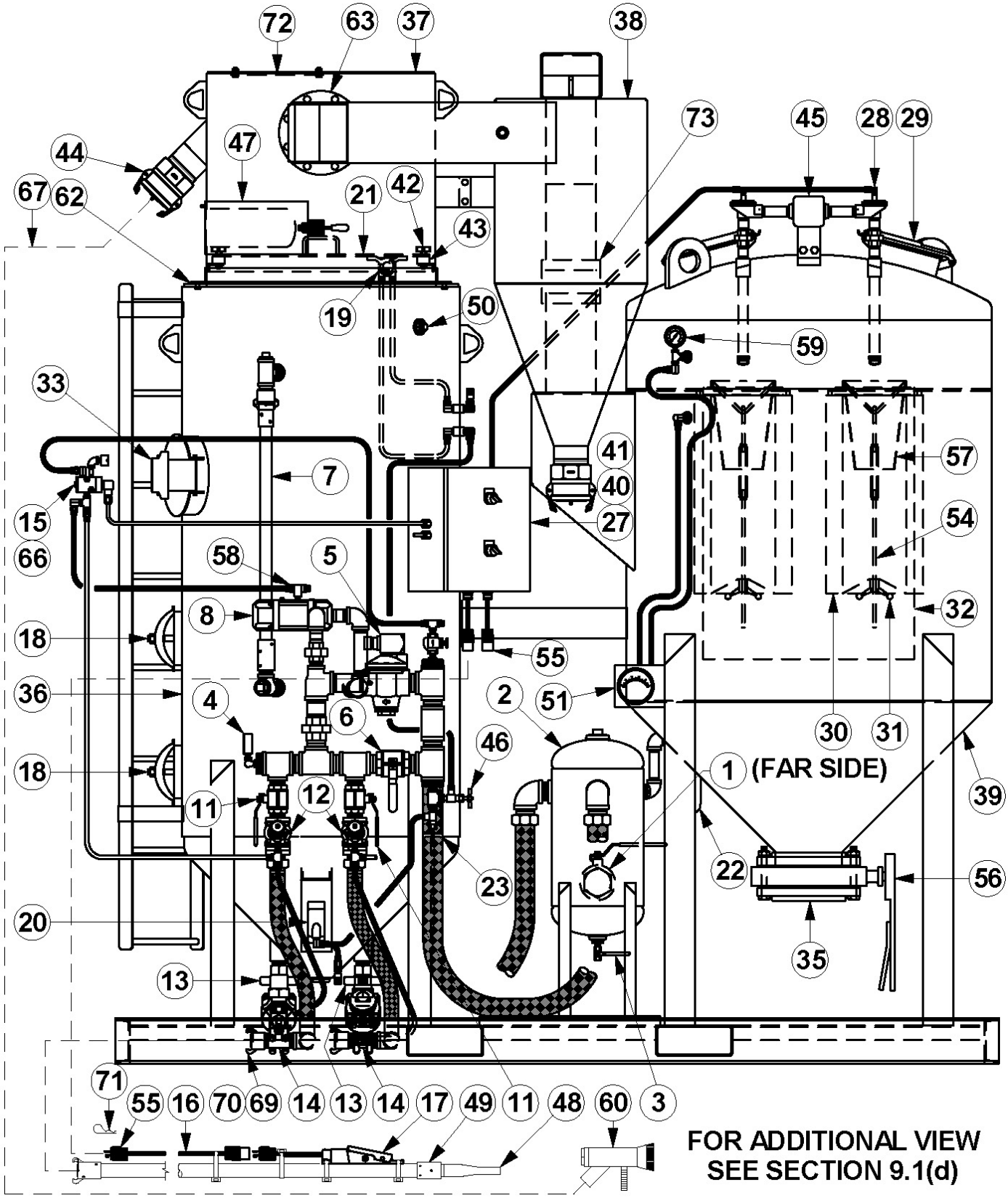


Figure 6.1 – Typical BRS2 Abrasive Blaster

6.2 BRS2 Abrasive Blaster Depressurizing Procedure (Blowdown)

6.2.1. The BRS2 Abrasive Blast System is a “depressurized” system, meaning the abrasive blast vessel will pressurize only when the Combo Valve® (#8) is opened by pressing down the deadman lever (#17).

6.2.2. The BRS2 abrasive blast system will automatically depressurize when the deadman lever (#17) is released. The blast vessel air pressure will exhaust through the blowdown hose (#7) and into the reclaim hopper. See Figure 6.1.

⚠ WARNING

Airborne particles and loud noise hazards from blowdown exhaust air can cause serious injury and loss of hearing. Wear approved eye and ear protection. Stay clear of blowdown air path. DO NOT place hands or other body parts in the blowdown air path. Make sure no personnel are in the blowdown air path. Do Not disconnect the blowdown hose (#7) from the reclaim hopper (#37).

6.2.3. The BRS2 abrasive blast system is equipped with two deadman control systems. Disconnect the twinline disconnects (#55) of both deadman control systems to disable the blast controls. This will prevent the automatic pressurization of the blast vessel. See Figure 6.2.

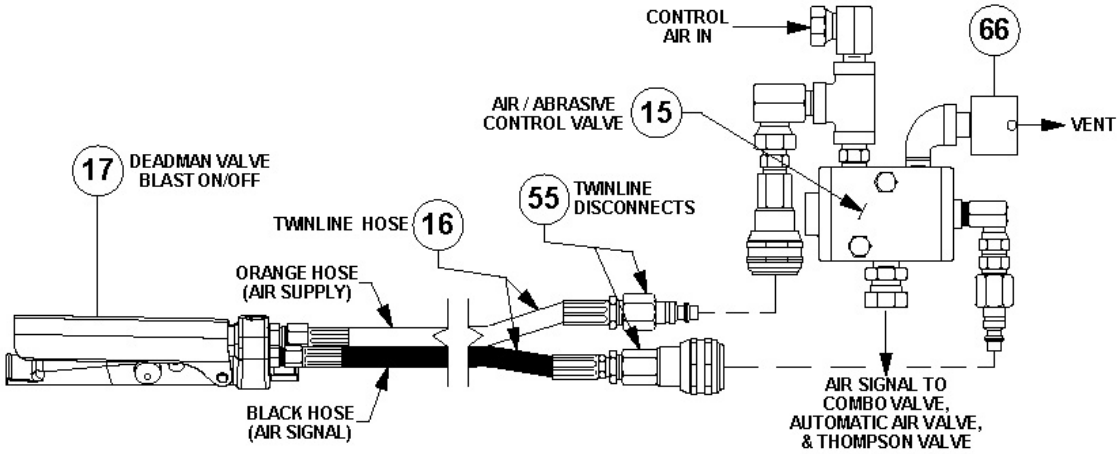


Figure 6.2(a) – Pneumatic Blast Control System

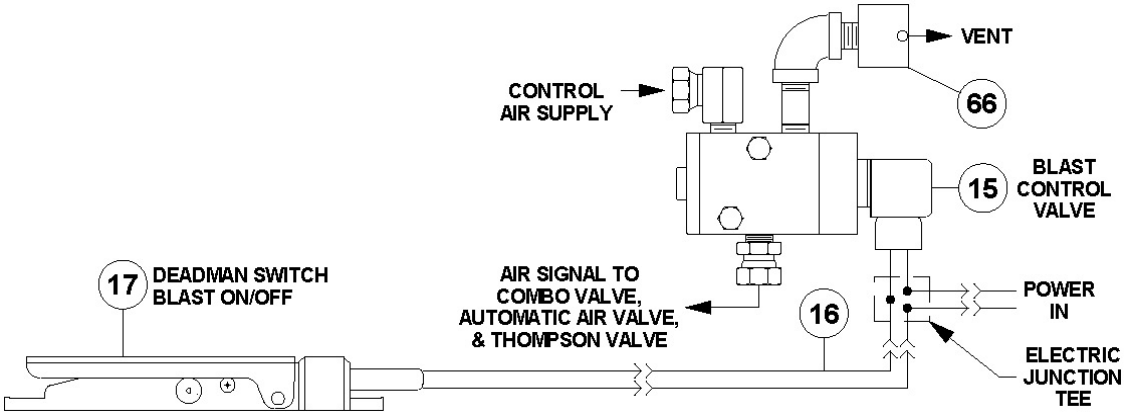


Figure 6.2(b) – Electric Blast Control System

6.3 Handway Cover Installation Procedures (See Figure 6.3(a))

6.3.1. Check that the handway cover, crab, bolt, and gasket are dimensionally correct for the size handway weld ring of the pressure vessel.

a) Measure and write down the inside dimensions “A” and “B” of the handway weld ring. See Figure 6.3(a).

b) Verify the size of the handway assembly by comparing the weld ring measurements from step “a” to the dimensions shown in Table 6.3(c).

c) Verify that the dimensions of the cover, crabs, bolts, and gasket match the corresponding dimensions given in Table 6.3(c). **Note:** The actual dimensions may vary by up to 1/4" from those given in Table 6.3(c).

d) Replace any component that is not dimensionally correct. Incorrect dimensions indicate that the component is part of a different size handway assembly.

⚠ DANGER

The handway assembly is part of a Pressurized Vessel. Use of incorrect handway components will result in assembly failure. Assembly failure will propel objects causing serious injury or death.

6.3.2. Inspect the handway gasket for tears, cracks, or other wear. Replace if necessary.

6.3.3. Inspect the handway weld ring sealing surface inside the vessel. Inspect the handway cover sealing surface. Both surfaces must be smooth.

6.3.4. Place the gasket on the handway cover then fit both through the opening.

6.3.5. Place the cover and gasket in position against the inside edge of the handway weld ring. Apply a pulling force to hold in position then proceed.

6.3.6. Center the gasket on the handway weld ring.

6.3.7. Center the handway cover on the gasket.

6.3.8. Center the handway crab on the outside weld ring.

6.3.9. Slide the handway crab bolt to the inside edge of the slot before tightening. See Figure 6.3(a).

6.3.10. When all components are centered and the crab bolt is bottomed in the slot, tighten the nut onto the bolt with a wrench until snug.

6.3.11. Only after completing all the pre-operation procedures in Section 6.0 and the abrasive blast vessel is then pressurized, re-tighten the nut with a wrench until snug again.

6.3.12. Do not over-tighten the crab nut and bolt. Over-tightening could bend the crab out of shape resulting in malfunction of the assembly.

6.3.13. Periodically check for leaks.

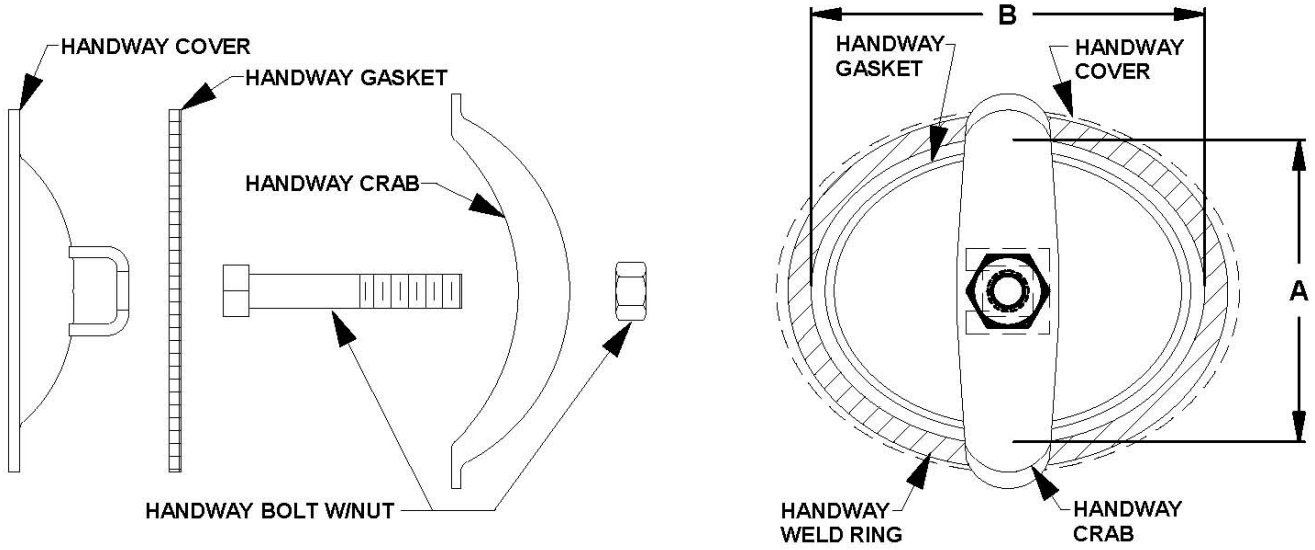


Figure 6.3 (a) – Handway Assembly

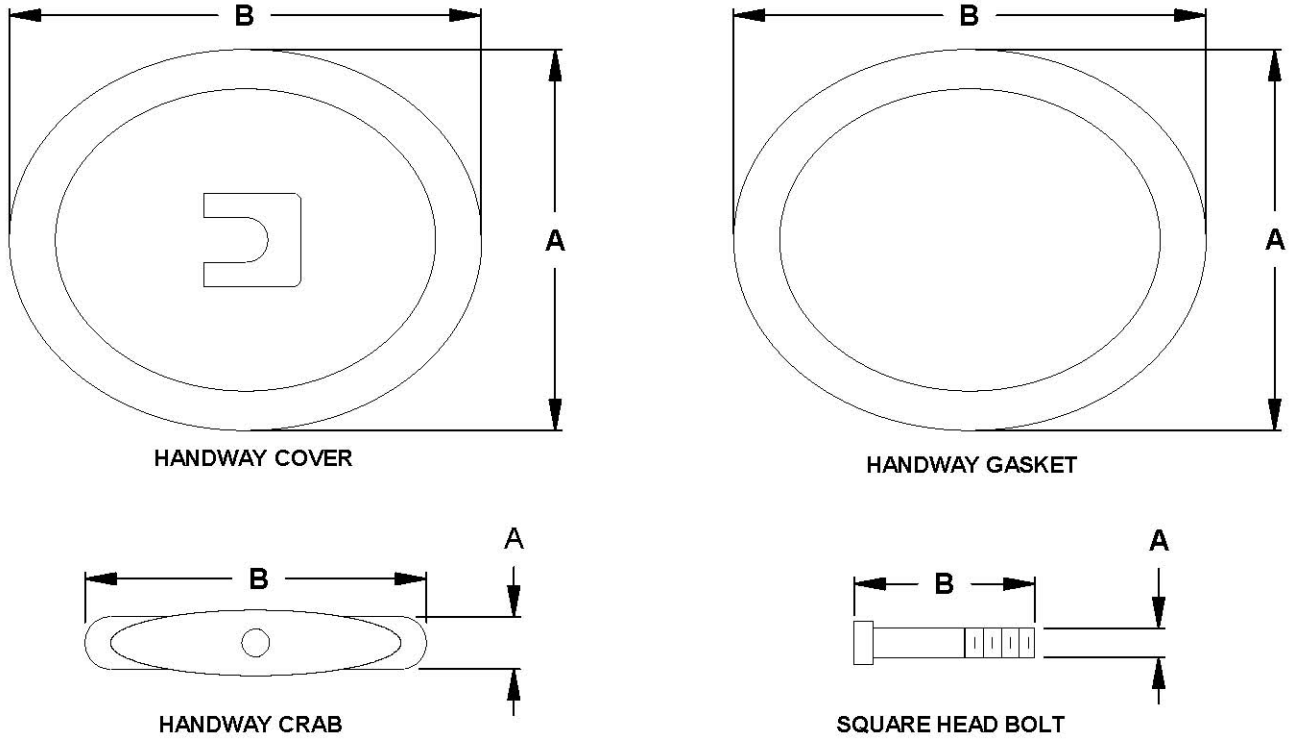


Figure 6.3 (b) – Handway Components

6” x 8” Handway Dimensions		
Component	A	B
Weld Ring	6-5/8”	8-1/2”
Handway Cover	7-11/16”	9-7/8”
Handway Gasket	7-3/4”	9-3/4”
Handway Crab	2-3/8”	8-3/4”
Square Head Bolt	3/4”-10 UNC	4-1/2”

Table 6.3 (c) – Handway Component Dimensions

7.0 Operating Instructions

7.1 Filling the BRS2 Abrasive Blast System with Abrasive

7.1.1. The BRS2 abrasive blaster must be completely depressurized before filling can begin. Disable the blast controls by disconnecting the twinline connections (#55) or the electric cords (for systems with electric blast controls). See Section 6.2.

⚠ WARNING

Airborne particles and loud noise hazards from blowdown exhaust air can cause serious injury and loss of hearing. Wear approved eye and ear protection. Stay clear of blowdown air path. DO NOT place hands or other body parts in the blowdown air path. Make sure no personnel are in the blowdown air path. Do Not disconnect the blowdown hose (#7) from the reclaim hopper (#37).

7.1.2. Connect vacuum hose to inlet connection (#44) to vacuum abrasive into the reclaim hopper.

7.1.3. Turn the control box (#27) main power switch and the pulse control switch to the “ON” position.

7.1.4. Open the air inlet ball valve (#1).

7.1.5. Open supply ball valve (#74) to begin vacuum.

7.1.6. Using the vacuum hose, vacuum abrasive into the blast vessel (#36).

7.1.7. Do Not overfill. Overfilling will cause abrasive to carry over into the secondary cyclone (#38) and the dust collector (#39).

7.1.8. Close supply ball valve (#74) to stop vacuum.

7.1.9. Turn the automatic pulse control switch to the “off” position.

7.1.10. Turn the control box (#27) main power switch to the “off” position.

7.2 Beginning the Blasting Operation (See Figure 7.2)

7.2.1. The BRS2 Abrasive Blast System must be properly prepared and all operating personnel must be thoroughly trained before beginning the blast operation. Completely read and understand all sections of this manual before beginning the blast operation. See the pre-operation procedures given in Section 6.0.

7.2.2. Perform the required inspections and maintenance before beginning the blast operation. See the instructions given in Section 8.0.

⚠ DANGER

The BRS2 abrasive blaster is a Pressurized Vessel. Propelled objects will cause serious injury or death. Depressurize vessel before performing any maintenance. See Section 6.2.

7.2.3. Open the abrasive shutoff valve(s) (#13). See Figure 7.2.

7.2.4. Open the manual choke valve(s) (#11). Leave the choke valves completely open at all times while blasting. Close the choke valve only for the "choke" procedure (see Section 11.3.2.). Do Not blast for long periods with the choke valve partially closed since this will cause excess wear in Thompson Valve® (#14).

7.2.5. For initial startup turn the Thompson Valve knob (#14) counterclockwise about four turns to partially open. The best setting for this valve differs from one situation to another; therefore it may take more than one adjustment to achieve the desired air/media mixture. Further adjustment can be made later as needed.

7.2.6. Open the air inlet ball valve (#1).

7.2.7. Slightly open the drain valve (#3) on bottom of the moisture separator (#2) and the petcock valve at the bottom of the air filter (#22) to allow moisture to continually drain during the blast operation. Once each day open the drain valve and petcock completely to blow out all moisture and dirt particles.

7.2.8. Turn on vessel vibrator (#20) and set the vibration by adjusting angle valve (#23).

7.2.9. Turn on reclaimer abrasive screen vibrator (#19) and set the vibration by adjusting angle valve (#46).

7.2.10. For initial startup back the knob of the air pressure regulator (#5) all the way out by turning the knob counterclockwise until no resistance is felt. Then turn the knob clockwise a few turns for a low initial pressure setting. Further adjustment can be made later as needed.

7.2.11. To operate at full pressure (without the restriction of the regulator) open the bypass ball valve (#6). This allows full air pressure into the control piping regardless of the air regulator adjustment.

7.2.12. The following steps are for setting the required blast pressure and abrasive flow. This determination may require several adjustments and testing of the blast flow. It is recommended that testing of the blast be made on a test piece so not to damage anything of value.

7.2.13. With one hand grip the blast hose assembly (#49) and with the other hand press in the deadman safety button. To begin blasting, aim the blast nozzle at the object to be blasted, then firmly press down the deadman lever (#17). Air and blast abrasive will flow into the blast hose and out of the blast nozzle (#48). Observe the blast stream and the coating removal rate. Release the deadman lever to stop blasting.

Do not aim blast nozzle towards yourself or any person. System malfunction can cause accidental start up and result in injury to personnel.

7.2.14. If necessary adjust tank pressure by turning the knob on the tank/blast pressure regulator (#5). Turn clockwise to increase pressure or counterclockwise to decrease pressure. The air pressure regulator is non-relieving therefore a reduction of tank pressure will not be evident on the gauge until blasting begins. For the most accurate setting, this adjustment should be made while blasting. The blast pressure is indicated by the pressure gauge (#4) while blasting. Bypass valve (#6) must be closed. Note: Further tank/blast pressure adjustment may be required when actual blasting is begun.

7.2.15. If necessary the abrasive flow can be adjusted with the knob on the Thompson Valve® (#14). Turn clockwise for less abrasive flow and counter-clockwise for more abrasive. Due to the length of the blast hose there will be a slight delay in control of the abrasive flow at the nozzle, therefore allow a few seconds before adjusting further. Note: If the blaster is equipped with the optional abrasive cut-off feature set the valve (or switch) to the “on” position to blast with abrasive. See Section 9.10.

7.2.16. Re-test the blast air and abrasive mixture again on a test piece to determine is further adjustment is needed. Release the deadman lever to stop blasting.

7.2.17. If the closed cycle blasting method (blasting with simultaneous vacuum recovery) will be used the blast pressure and abrasive flow adjustments detailed in steps 7.2.12 through 7.2.16 must be made after completing the instructions given in Section 7.3.

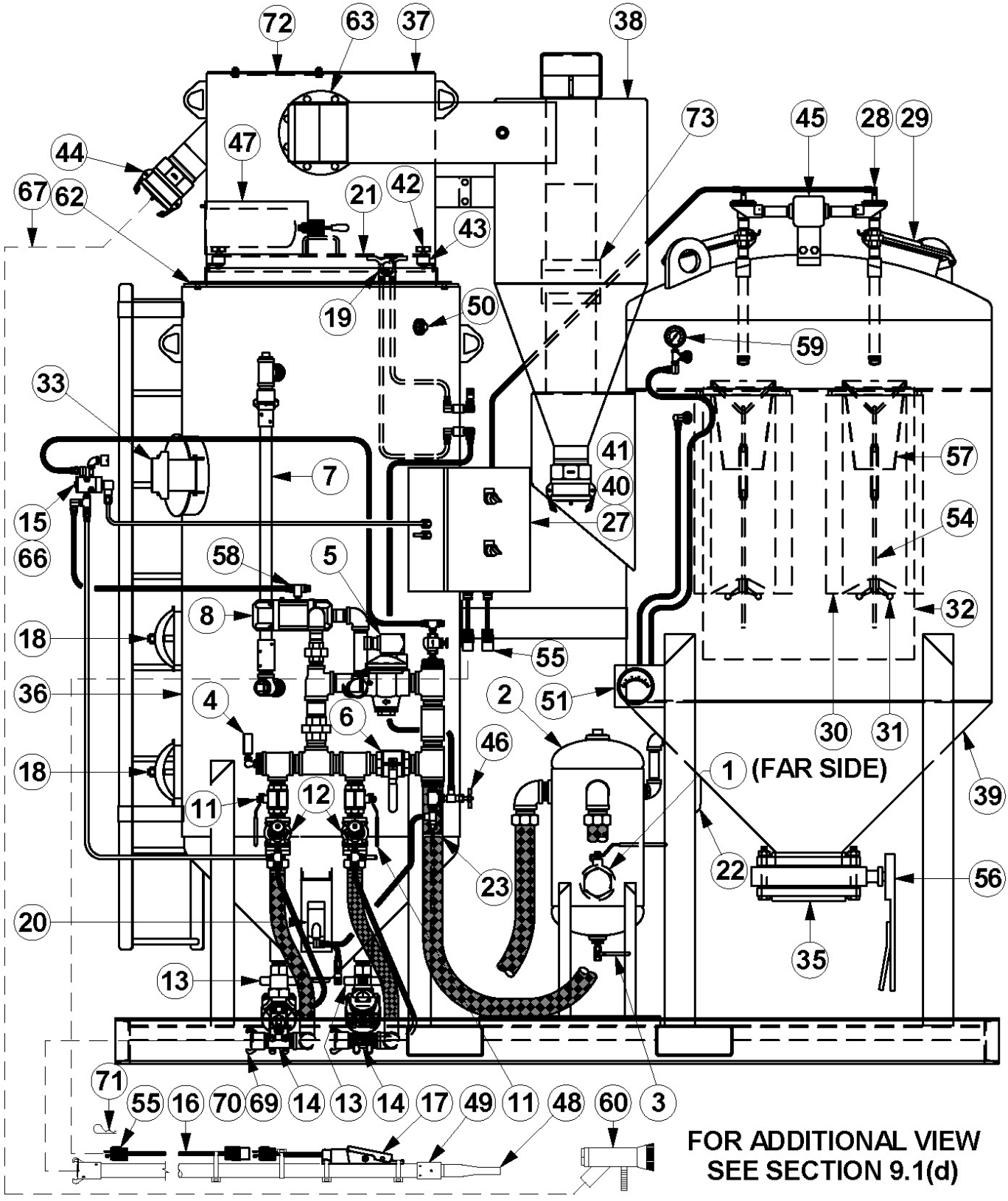


Figure 7.2 – Typical BRS2 Abrasive Blaster

7.3 Closed Cycle Blasting (simultaneous vacuum recovery)

7.3.1. The BRS2 Abrasive Blast System must be properly prepared and all operating personnel must be thoroughly trained before beginning the blast operation. Completely read and understand all sections of this manual before beginning the blast operation. See the pre-operation procedures given in Section 6.0 and the initial blast operating procedures given in Section 7.2.

7.3.2. To operate in the closed cycle mode (blasting with simultaneous vacuum recovery) requires the BRS blast head (#60) and a vacuum hose (#67). See Section 5.16.

7.3.3. Inspect the brushes on the BRS vacuum head (#60). Replace any that are worn or damaged. Refer to drawing in Section 9.9.

7.3.4. Connect the BRS vacuum head (#60) to the nozzle holder (#49) of the blast hose assembly.

7.3.5. Connect the vacuum hose (#67) between the blast head and the reclaimer vacuum port (#44). Refer to Figure 7.2.

7.3.6. Turn the control box (#27) main power switch and the pulse control switch to the "ON" position.

7.3.7. Adjust the pulse cycle as required during blast/reclaim operation. The interval between pulses can be changed by adjusting the "OFF TIME" on the pulse timer board (#40) located in the control box (#27). To adjust the "OFF TIME", press the select button located on the upper right corner of the timer board until the "OFF TIME" LED is illuminated, then press the adjust button located to the left of the select button until the required time is displayed on the digital readout. The "OFF TIME" is adjustable from 1 to 180 seconds in 1 second increments. The pulse length can be changed by adjusting the "ON TIME". To adjust the "ON TIME", press the select button until the "ON TIME" LED is illuminated, then press the adjust button until the required time is displayed on the digital readout. The "ON TIME" is adjustable from 30 to 350 milliseconds in 5 millisecond increments. The pulse effect can be seen by a decrease in the vacuum reading on the pressure gauge (#51). The automatic pulse jet controls can be disabled by turning the switch on the front of the control box to the "OFF" position. **Caution:** An excessive "ON TIME" will cause the pulse air to overpower the vacuum resulting in reduced abrasive recovery capabilities.

7.3.8. Place the BRS blast head (#60) against the surface to be blasted.

7.3.9. With one hand grip the blast head assembly (#60) and with the other hand press in the deadman safety button. To begin blasting, hold the blast head against the object to be blasted, then firmly press down the deadman lever (#17). Air and blast abrasive will flow into the blast hose and out of the blast nozzle (#48). Release the deadman lever to stop blasting.

Do not aim blast nozzle towards yourself or any person. System malfunction can cause accidental start up and result in injury to personnel.

7.3.10. Make necessary adjustments to the blast pressure and abrasive flow as detailed in steps 7.2.14 through 7.2.16 in Section 7.2.

7.3.11. Re-test the blast air and abrasive mixture again on a test piece to determine is further adjustment is needed. Release the deadman lever to stop blasting.

7.4 Ending the Blast Operation (See Figure 7.2)

7.4.1. Press the "Stop Vacuum" button to shut down the electric vacuum system.

7.4.2. Turn the automatic pulse control switch to the "off" position to disable the dust collector filter pulsing.

7.4.3. Turn the control box (#27) main power switch to the "off" position.

7.4.4. Close the air inlet ball valve (#1). The ball valve is closed when the handle is fully turned to the position shown in Figure 7.2 (handle perpendicular to body). The handle tab will bottom against the ball valve body in the closed position.

⚠ CAUTION

Do not turn off the air compressor and allow the abrasive blaster air pressure to back flow through the system. Back flow will carry abrasive into the moisture separator (#2) and contaminate the controls.

7.4.5. Completely open ball valve (#3) at the bottom of the moisture separator (#2) and the petcock valve at the bottom of the air filter (#22) to allow all the accumulated moisture to be drained out. Close the ball valve and petcock after draining.

7.4.5. For long periods of non-usage, remove remaining blast abrasive to prevent moisture contamination.

7.5 Vacuum Recovery of Blast Abrasive

7.5.1. After open blasting the used abrasive can be vacuum recovered back into the BRS2 blast system by following the filling procedure given in Section 7.1.

7.5.2. The used abrasive will contain dust particles that will be carried into the secondary cyclone (#38) and the dust collector (#39). Adjust the pulse controls as detailed in Section 7.3.

7.5.3. Empty the dust drum (#34) and the dust collector (#39) as detailed in Section 6.1.

⚠ DANGER

Abrasive blasting produces dust which may contain Silica and other toxic substances that can cause severe and permanent lung damage, cancer, and other serious diseases if inhaled. Wear OSHA approved respiratory protection when opening the dust collector and/or the dust drum. See Sections 3.8, 3.10, and OSHA 29 CFR 1910.134.

8.0 Maintenance and Inspection Instructions

⚠ DANGER

The BRS2 abrasive blaster is a Pressurized Vessel. Propelled objects will cause serious injury or death. Depressurize vessel before performing any maintenance. See Section 6.2.

⚠ WARNING

For proper operation, maintenance should be performed with the assistance of a qualified serviceman.

8.1. ***Blaster Pressure Vessel:*** The ASME Code is a standard covering materials, design, fabrication, and installation of pressure vessels. Vessel integrity subsequent to purchase is the responsibility of the owner and/or user. At intervals required by state law and/or local authorities, the vessel should be subjected to a hydrostatic test as described in the ASME Code, Section VIII, Division 1. Do Not subject the abrasive blaster pressure vessel to a pneumatic proof test exceeding the maximum allowable working pressure. In no case should the hydrostatic test pressure exceed 1.3 times the maximum allowable working pressure (MAWP) shown on the pressure vessel nameplate. Thoroughly clean and dry the vessel before re-assembly. Moisture or debris left in vessel can cause equipment malfunction.

8.2. ***Blaster Pressure Vessel:*** Any damage to an abrasive blaster can make it unsafe. Inspect the exterior of the abrasive blast vessel daily for corrosion, pitting, or other damage (i.e. dents, gouges or bulges). If damaged, take out of service immediately and have it inspected and/or repaired by a qualified facility. Contact Axxiom Manufacturing, Inc. for technical support.

8.3. ***Blaster Pressure Vessel****:* The interior condition of the abrasive blast vessel (#36) should be inspected quarterly. Pitting caused by corrosion will reduce the wall thickness of the vessel. If excessive corrosion is found, have the abrasive blast vessel inspected by a qualified facility. Contact Axxiom Manufacturing, Inc. for technical support.

Check the pressure vessel internal piping for corrosion, cracks, and holes.

8.4. ***Popup Assembly:*** The popup alignment and operation is tested by the manufacturer, however vibration and creeping during shipment may cause the internal popup support piping to shift resulting in misalignment. Prior to initial usage and periodically thereafter, the popup gap and alignment should be checked. Inspect the popup as follows:

a) Depressurize the BRS2 abrasive blaster per Section 6.2.
b) Disconnect air supply hose from the crowfoot (#65).
c) Inspect the popup gasket (#9) and popup head (#10) sealing surfaces for wear or deformations. Replace either if necessary.
d) Check that the popup is centered within the gasket opening. If necessary, use a pry bar as a lever between the popup and gasket to deflect the internal support piping and shift the popup to the center of the gasket opening.
e) Check the popup gap (distance between the popup surface and the gasket). It should be between 0.625” and 0.840”. See Figure 8.1. An excessive gap is created by a vertical nipple that is too short. An excessive gap will expose the top of the vertical nipple to abrasive when the popup closes which could result in premature wear to the popup.
f) After checking the alignment and gap, pressurize the blast vessel and check the popup for air leaks. If a leak is present, repeat the above steps to isolate the problem.

⚠ WARNING

Pinch point hazard. Vessel pressurization will close the popup. Keep fingers clear of the popup opening. Disconnect air supply prior to performing popup maintenance.

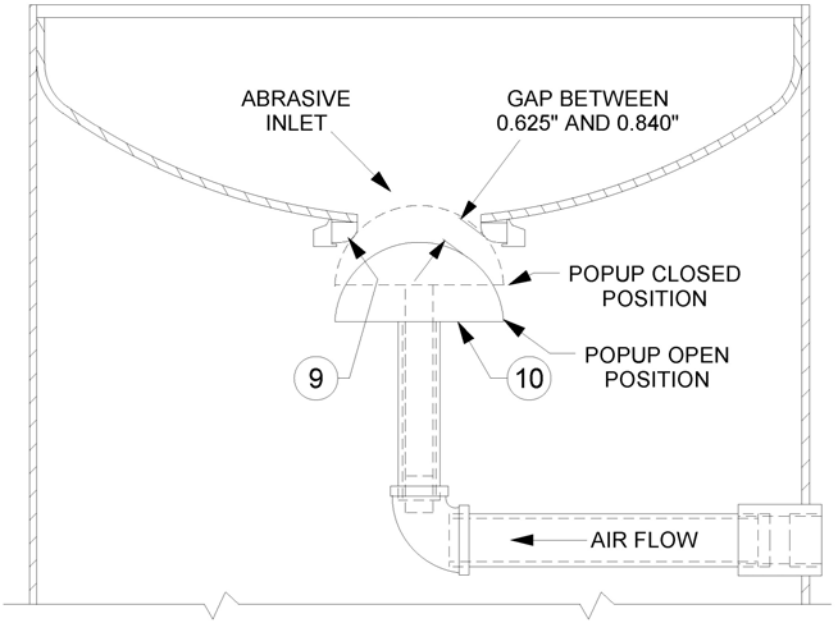


Figure 8.1 – Standard Popup Assembly

8.6. ***Blast and Air Hoses:*** All air hoses, blast hoses, control hoses, and wires should be inspected daily for wear, dry rotting, cracking or leakage. Repair or replace any hoses or wires that show any signs of wear, leakage or other damage. Damaged wires and/or hoses can cause system malfunctions and can result in serious injury or death to operating personnel.

Blast hoses are a high wear component of the abrasive blast system. Sharp bends in the blast hose create high wear points resulting in soft spots that can rupture while blasting. Check the full length of the blast hose assembly for soft spots caused by wear. To prevent serious injury to personnel replace blast hoses with soft spots. Note: Static electricity is generated by the abrasive flow through the blast hose. To prevent static electrical shock to operating personnel only use static dissipating blast hose and install a grounding strap on the abrasive blaster.

⚠ WARNING

Worn blast hose assemblies can rupture while blasting and the resulting abrasive blast stream can cause serious personal injury.

8.7. ***Blast and Air Hoses:*** All air hose, blast hose, and threaded couplings have pin holes that align when connected. To prevent accidental hose disconnections safety pins must be installed through these holes. Each hose connection must also include a hose whip check that will hold the hose if there is an accidental disconnection. Connect one loop to each side of the connection and stretch out as shown in Figure 8.2 below. Check hose connections daily and replace missing or damaged pins and whip checks.

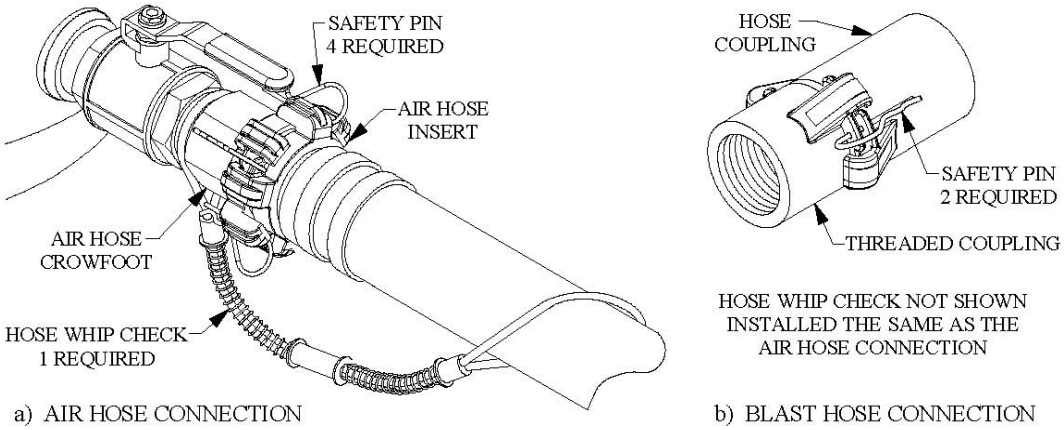


Figure 8.2 – Hose Connection Disconnect Protection

8.8. ***Blast and Air Hoses:*** All air hose, blast hose, and threaded couplings have gaskets that seal the connection. To prevent loss of air pressure and/or premature abrasive wear replace these gaskets when leaks are found. Inspect the couplings daily for leaks and wear. Replace gaskets when visible wear or leaks are found. When installing or replacing hose couplings cut the hose end square for secure fit (see Figure 8.3). To insure proper coupling connection always use fittings that are the same brand. See the drawings and part lists in Section 9.1 and 9.2.

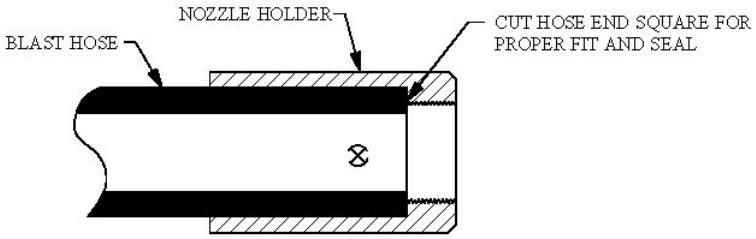


Figure 8.3 – Hose End Fit up

8.9. ***Blast Nozzle:*** Remove the blast nozzle daily and check the jacket and thread condition. Check nozzle throat diameter. An over-sized throat diameter reduces blast efficiency. Replace the blast nozzle if worn or damaged.

8.10. ***Valves:*** Thompson Valves, Automatic air valves, control valves, and deadman valves should be disassembled and inspected quarterly, or more frequently if heavily used. The Thompson Valve cylinder should be cleaned and lubricated with an anti-seize compound. Replace parts as needed with Schmidt® original factory replacement parts furnished by an authorized Schmidt distributor. Periodically check if air is leaking from end of blast nozzle when the blast operation is off. A worn Thompson Valve® seat usually causes this. It is replaced by removing the four bolts in the base of the valve to allow disassembly. Refer to valve drawings in Sections 9.0.

⚠ DANGER

Depressurize vessel before performing any maintenance. See Section 6.2. Removing the Thompson valve bolts with the BRS2 blaster pressurized will result in serious injury or death.

⚠ WARNING

Use of replacement components that are not Schmidt original factory replacement parts may result in equipment failure which can result in serious personal injury.

8.11. ***PPE:*** Check daily to verify that all personal protective equipment is available for each blast operator. Check daily to verify that all personal protective equipment is in good operating condition. Consult the operating and maintenance instructions provided by the manufacturer of each PPE item. See Section 3.10 and reference OSHA 29 CFR 1910 Subpart I.

⚠ WARNING

Failure to use personal protective equipment could result in serious injury or death.

8.12. ***Warning Decals:*** Check monthly to verify that all the warning decals are in position and legible. See Section 0.0 for full descriptions and locations.

⚠ DANGER

Failure to maintain warning decals risks the possibility of not alerting the abrasive blaster operator to potential dangers which can result in serious injury or death. See Section 0.0.

8.13. ***Combo Blowdown:*** The blowdown hose (#7) that passes through the combo valve (#8) is a 3/4" blast hose. Abrasive carry-over can wear a hole through the wall of the hose. Replace the hose with another section of hose, but make sure that the hose does not make any tight bends anywhere between the blast pot and the cyclone because this will cause the wear to be much more rapid.

8.14. ***Abrasive Reclaim Hopper:*** The abrasive screen (#21) inside the reclaimer hopper (#37) will accumulate trash screened from the vacuum reclaimed abrasive. The screen should be periodically checked and cleaned. It can be accessed through the access door (#47).

8.15. ***Secondary cyclone:*** During the vacuum recovery of abrasive the depleted abrasive that is carried through the reclaimer accumulates in the 1.5 cu.ft. dust drum (#34). The dust drum must be emptied daily. Disconnect the camlock hose connection from the drum. The drum can then be removed so the depleted abrasive can be disposed of properly.

8.16. ***Dust collector:*** During vacuum recovery of abrasive the depleted abrasive accumulates in the bottom of the dust collector (#39). The dust collector must be drained weekly. Place a container below the dust collector then open the butterfly valve (#56) to drain the accumulated dust.

⚠ DANGER

Abrasive blasting produces dust which may contain Silica and other toxic substances that can cause severe and permanent lung damage, cancer, and other serious diseases if inhaled. Wear OSHA approved respiratory protection when opening the dust collector and/or the dust drum. See Sections 3.8, 3.10, and OSHA 29 CFR 1910.134.

8.17. ***Dry filter cleaning:*** To achieve the longest life of the dry filter it is important that they be serviced regularly. The following methods are recommendations to assist in cleaning BRS2 dry filters. The first three are for both paper element filters and polyester element filters. However, be aware that the washing method is for polyester element filters only.

8.17.1. Air pulsing

The first cleaning step should be air pulsing. This is done by activating the automatic pulse system to provide a burst of air inside the filters to loosen dust particles from the pleated surface. It is not necessary to run the vacuum system (#26) for air pulsing.

8.17.2. Vacuum method

The second cleaning method to utilize is vacuuming. A commercial duty vacuum cleaner is recommended, but a common household type may also be used. Vacuum the filter from the air intake (contaminated) side only. This procedure will remove the majority of the large particles and surface contaminants that have accumulated and may be sufficient for the first cleaning of the filter. This step should also be performed prior to progressing to any subsequent cleaning method.

8.17.3. Compressed air method

The third cleaning step is by use of compressed air. The air flow must be directed from the opposite direction of the normal air flow through the filter. The air flow should be directed up and down the pleats. Do not direct the flow in a cris crossing pattern across the direction of the pleats this could cause damage to paper element filters and decreases cleaning efficiency.

8.17.4. Washing method (polyester element filter only)

The washing process is for polyester element filters only. The final cleaning process may be necessary to reduce the static pressure to an acceptable level when the filter has fine particles that have become imbedded in the filter element. For this procedure a mild low suds detergent should be used with clean warm water. Soak the filter for 5-10 minutes, and then gently agitate the filter for several minutes. The filter should then be thoroughly rinsed with clean water to remove the detergent. It may require a second or third washing to obtain satisfactory filtration. However, the dirt holding capacity of the filter decreases after each washing.

Critical: Do not attempt to wash dry filters with paper elements, this will render them useless. If you are not certain of the type of element seek assistance.

Note: Polyester element filters can be washed and reused under proper conditions. However, Schmidt has no control over the washing process and cannot guarantee that it has been performed properly and effectively, therefore normal warranty does not apply to filters that have been washed.

8.17.5. Inspection

The final step after cleaning the filters is a visual inspection. A simple method of inspection is to use a light bulb. Light passing through the filter will reveal fatigued paper or dirt accumulations. Inspection should also include the end plates to check for possible damages during handling. Inspect for damage that could allow contaminated air to bypass the filter element.

8.18. ***Pneumatic Vacuum System:*** The vacuum system vacuum pump requires no maintenance. The air hoses leading to supply ball valve (#74) should be inspected daily for wear, dry rotting, cracking or leakage. Repair or replace hoses that show any signs of wear, leakage or other damage. Damaged hoses can cause vacuum system malfunctions and can result in serious injury or death to operating personnel.

8.19. ***Handway Assembly:*** Refer to Section 6.3 for installation and inspection procedures.

8.17. Maintenance Schedules Quick Reference Charts

BRS2 ABRASIVE BLASTER MAINTENANCE SCHEDULE					
ITEM	**MAINTENANCE REQUIRED**	**DAILY**	**WEEKLY**	**MONTHLY**	**QUARTERLY**
Blaster Vessel	Hydrostatic Test See Section 8.1	As required by state law and/or local authorities			
Blaster Vessel	Check for exterior damage (corrosion, dents, bulges). See Section 8.2	X			
Blaster Vessel	Check for interior damage (corrosion / pitting). See Section 8.3				X
Popup	Check sealing surfaces, alignment and gasket to popup gap. See Section 8.4		X		
Blast & Air Hoses	Check hoses for soft spots, wear, cracks, or air leaks See Section 8.6	X			
Remote Control Hoses	Check hoses for soft spots, wear, cracks, or air leaks See Section 8.6	X			
Remote Control Wires	Check wiring for bare spots, fraying, or cracks See Section 8.6	X			
Blast & Air Hose Couplings	Check for safety pins and whip checks See Section 8.7	X			
Hose Coupling Gaskets	Check for leaky air and blast hose coupling gaskets See Section 8.8	X			
Blast Nozzle	Check blast nozzle threads and jacket and for air leaks See Section 8.9	X			
Valves	Disassemble, inspect, and lubricate. See Section 8.10				X
Personal Protective Equipment	Check condition of all personal protective equipment See Section 3.10 and 8.11	X			
Warning Decals	Check the condition of warning decals. See Sections 0.0 and 8.12			X	
Combo Blowdown	Check condition of Blowdown hose See Section 8.13		X		
Reclaimer Screen	Clean trash from Abrasive screen See Section 8.14	X			
Cyclone Dust Drum	Empty secondary cyclone dust drum See Section 8.15	X			
Dust Collector Drain	Drain dust from dust collector See Section 8.16		X		
Dust Collector Air Filters	Clean and inspect dust collector filters See Section 8.17			X	
Vacuum System	Check hoses for soft spots, wear, cracks, or air leaks See Section 8.18	X			
Handway Assembly	Check condition of gasket and sealing surfaces See Sections 8.19 and 6.3.			X	

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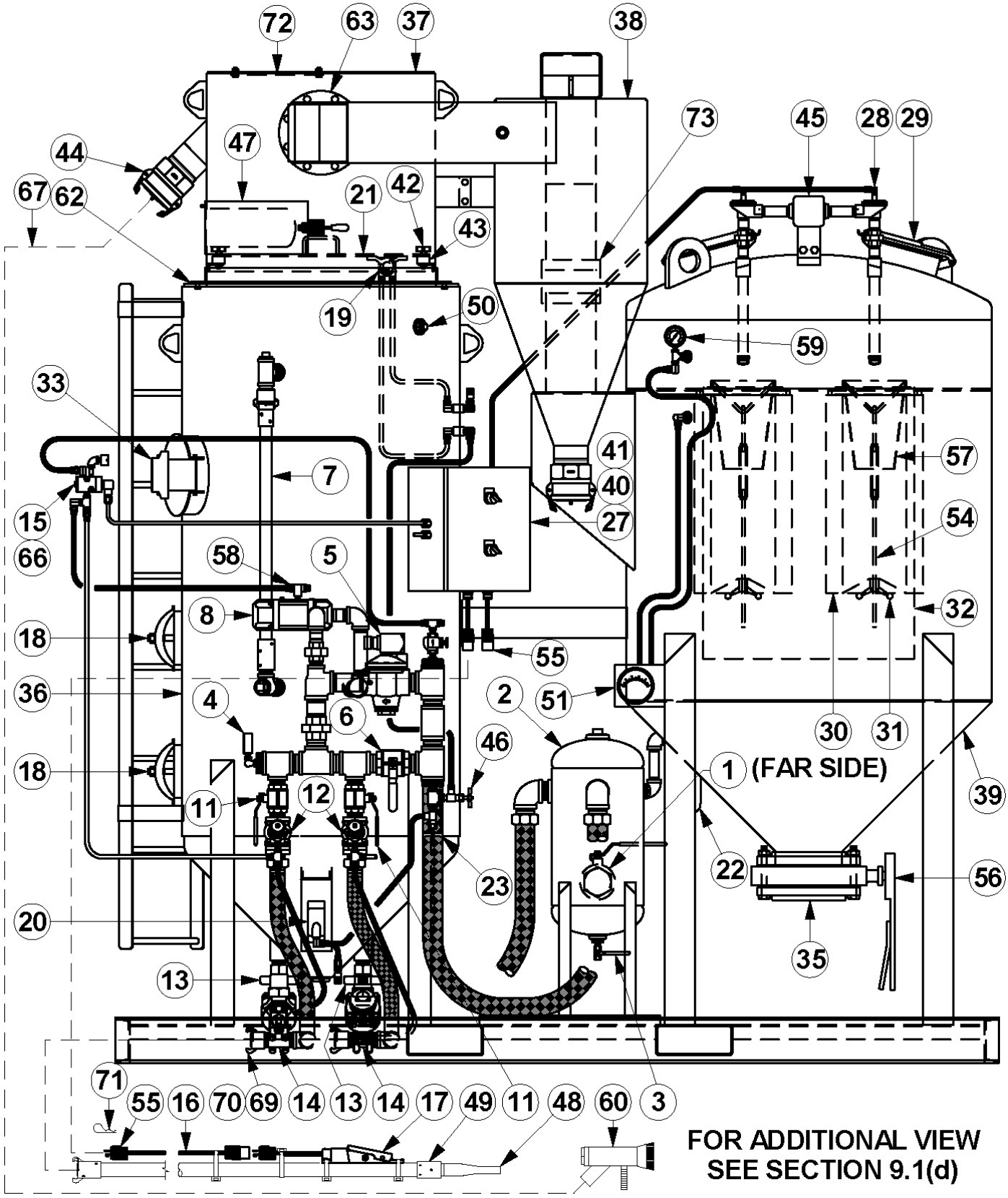
9.0 Drawings and Parts Lists

The following pages contain drawings representing typical blast control systems and components. Determine the type of control system the abrasive blast system is equipped with (pneumatic or electric controls), then reference the appropriate drawing and parts list to determine the required parts. To insure the proper operation of the blast system only use Schmidt® original factory replacement parts furnished by an authorized Schmidt distributor. See Section 1.37 and Section 12.2.12.

9.1(a) BRS2 Abrasive Blaster (Front View)



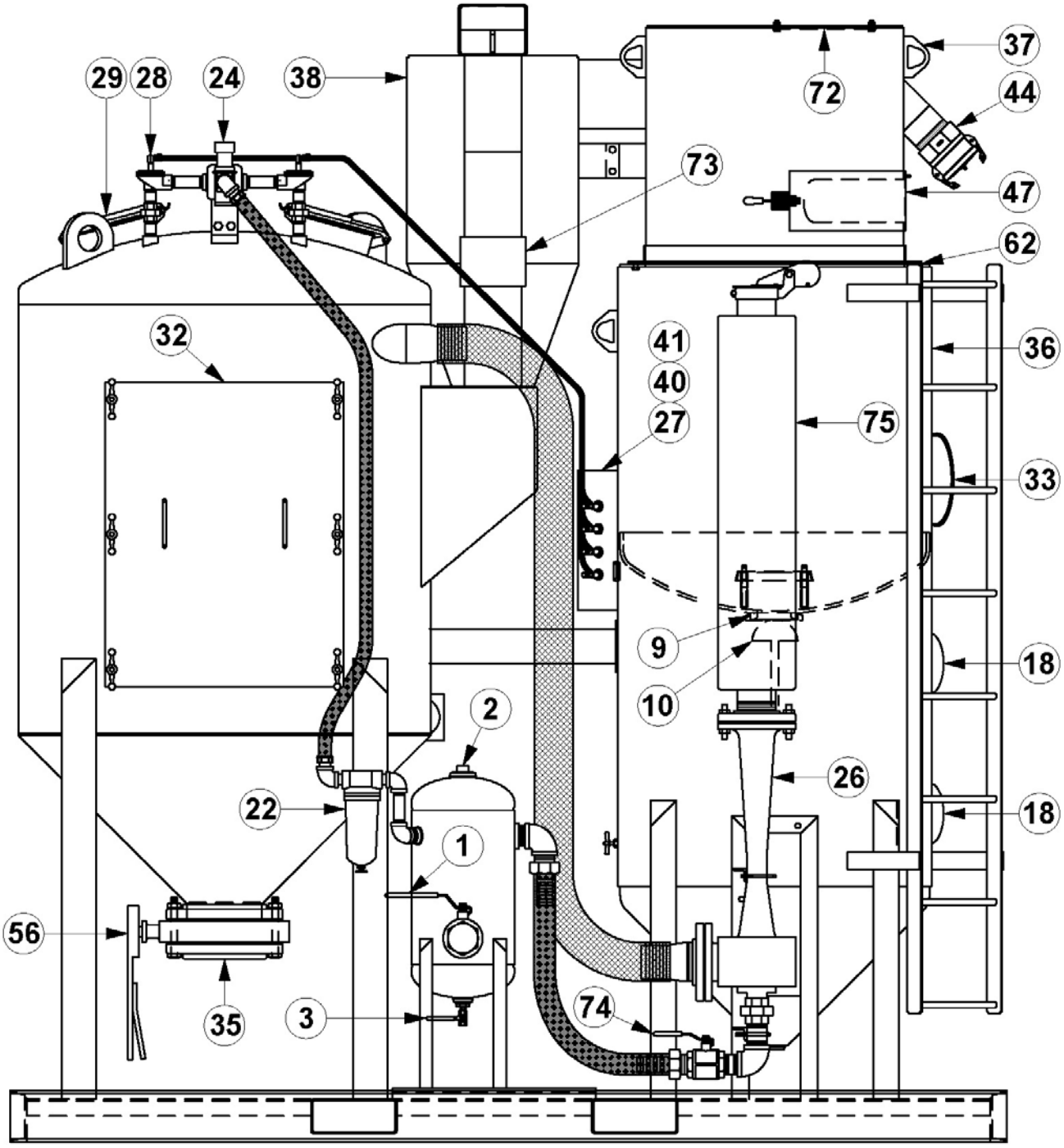
9.1(b) BRS2 Abrasive Blast System Parts List

Item	Part Number	Description
1	2401-511	Ball valve, full port 3"
2	8082-000-21	800 CFM Moisture separator, 3" x (2)2" x 1"
3	2401-502	Ball valve, full port 1/4"
4	2010-009-01	Pressure gauge, 0-160 psi
5	2000-008	Regulator, 2" slave
	2001-011	Pilot regulator, 1/4" (R40)
6	2401-509	Ball valve, full port 2"
7	4104-005	Hose, 4-ply 3/4" (specify length)
8	2223-000	Combo valve, 1-1/4"
9	2100-011	Popup gasket
10	2100-010	Popup head w/stem
11	2401-508	Ball valve, full port 1-1/2"
12	2123-108	Automatic air valve, n.c. 1-1/2"
13	2408-907	Union end ball valve, 1-1/4"
14	2152-008	Thompson valve II, tungsten carbide 1-1/2"
15	2229-100	Control valve, electric 12VDC
16	7074-055	Extension Cord, 55 ft.
17	2263-400-01	Electric deadman
18	7000-001-11	Handway crab assembly, 6" x 8"
	7000-001-06	Handway gasket, 6" x 8"
19	2020-013	Vibrator, model 13
20	2020-025	Vibrator, model 25
21	9001-002	BRS2 media screen
	8031-000-91	Screen rubber trim (specify length)
22	2302-206-50	Air filter, 1" 50 micron
23	2430-804	Angle valve, 1/4"
24	2003-006	Regulator, 1" non-relieving
25	----	Not available on this model
26	2015-013P	Eductor body cast iron 4"
	2015-513-02	Eductor nozzle 4" 550 CFM
27	8083-285-11F	BRS2 pulse control box 120 VAC
28	8032-000-58	Pulse valve, 1"
29	7008-017	Hatch, 8"
30	8031-000-24	Dry filter, 12" paper element
	8031-000-09	Dry filter, 12" polyester element
	8031-000-83	Dry filter, 12" high output
31	8031-001-11	Dry filter knob
32	8082-000-24	Dust collector door gasket
33	7008-019	Hatch, 10"
34	----	Dust drum (optional)
35	7003-317	Slip-on flange 8" 150#
36	8083-000-01	BRS2 20 c.f. vessel
37	8083-285-11D	BRS2 20 c.f. reclaimer
38	8083-285-11E	BRS2 cyclone

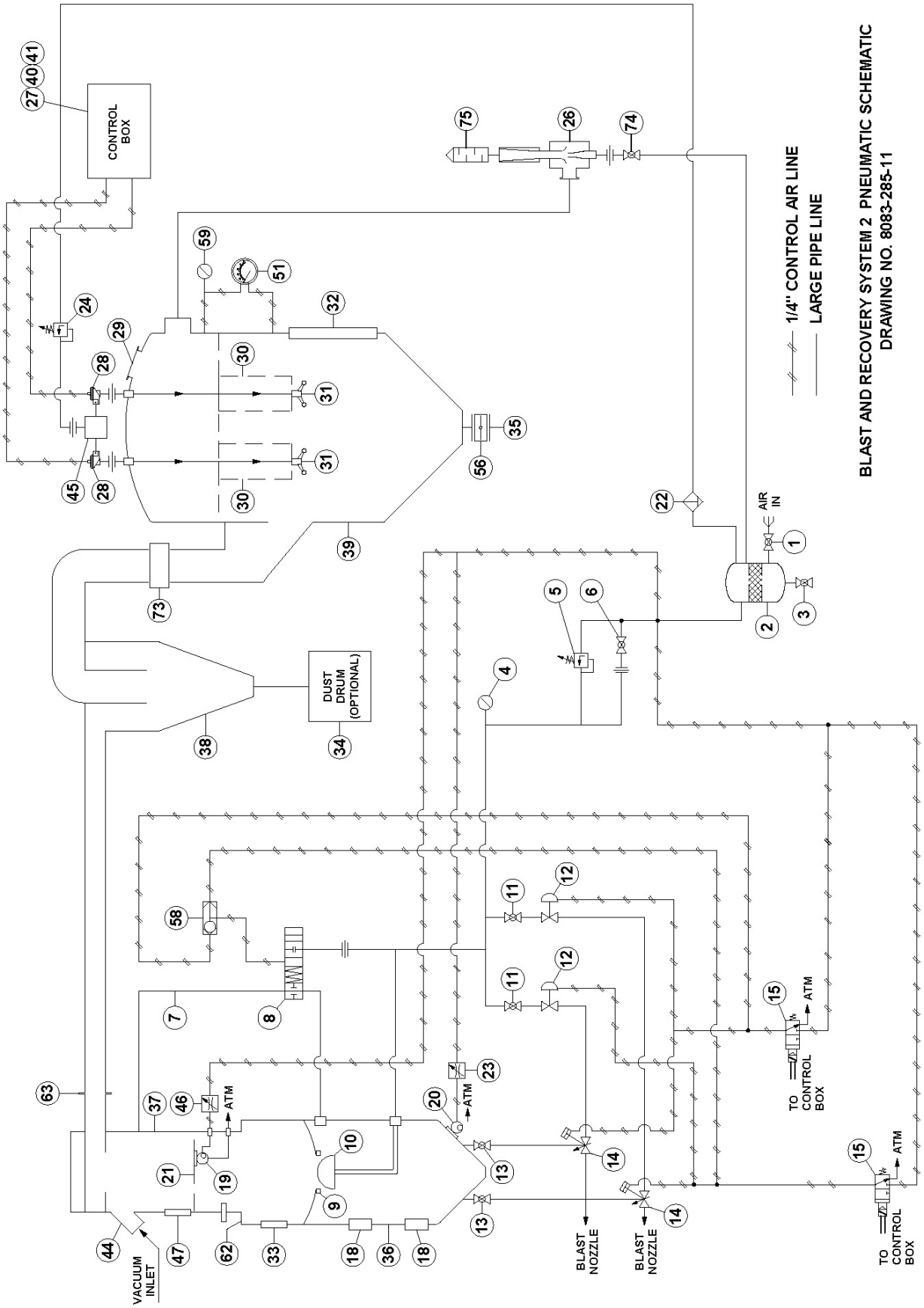
9.1(c) BRS2 Abrasive Blast System Parts List (continued)

Item	Part Number	Description
39	8083-285-11B	BRS2 dust collector
40	7135-083	Timer board, 120 VAC
41	8032-000-45	Pulse control valve, 120 VAC
42	8031-000-42	Screen knob
43	8031-000-46	Screen isolator
44	4223-413	Camlock type DC, 4”
	4217-413	Camlock type A, 4”
45	8082-000-19	Pulse manifold
46	2430-804	Angle valve, 1/4"
47	8082-000-44	Reclaimer door gasket
48	5000-xxx	Blast nozzle (specify size)
49	4104-40x-0x	Blast hose (specify size and length)
	8031-000-32	BRS threaded nozzle holder
50	3014-005	Plug, 3/4"
51	2010-013-10	Differential pressure gauge
52	----	Not available on this model
53	----	Not available on this model
54	8082-000-37	BRS2 filter turnbuckle
55	7109-301	Electric plug, 3 prong male, twist lock
	7109-300	Electric connector, 3 prong female, twist lock
56	2442-817	Butterfly valve, 8"
57	8032-000-48	Pulse venturi
58	2450-302	Shuttle valve, 1/4”
59	2010-026	Pressure gauge, 30 Hg vac-0-15 psi
60	8031-000-36	BRS vacuum workhead, 3" style II
	8031-000-37	Vacuum workhead brush, 3"
	8031-000-43	Vacuum workhead insert sleeve, 2" lg.
	8031-000-44	Vacuum workhead insert sleeve, 3" lg.
	8031-000-45	Vacuum workhead insert sleeve, 4" lg.
61	----	Not available on this model
62	7003-131-01	Angle flange gasket, 30”
63	7004-015-01	Flange gasket, flat face 6" 150#
64	----	Not available on this model
65	----	Not available on this model
66	2013-402	Dust eliminator, 1/4"
67	4107-011-50	Vacuum Hose, 3”
68	----	Not available on this model
69	4214-108-01	Threaded coupling, 1-1/2" NPS
70	4214-999	Coupling gasket
71	7119-002	Safety pin, air/blast hose coupling
72	8082-000-28	Reclaimer wear plate
73	7070-015	Coupling, rubber boot 6"
74	2401-509	Ball valve, full port 2"
75	2011-013-02	Muffler, 4" hi-attenuation

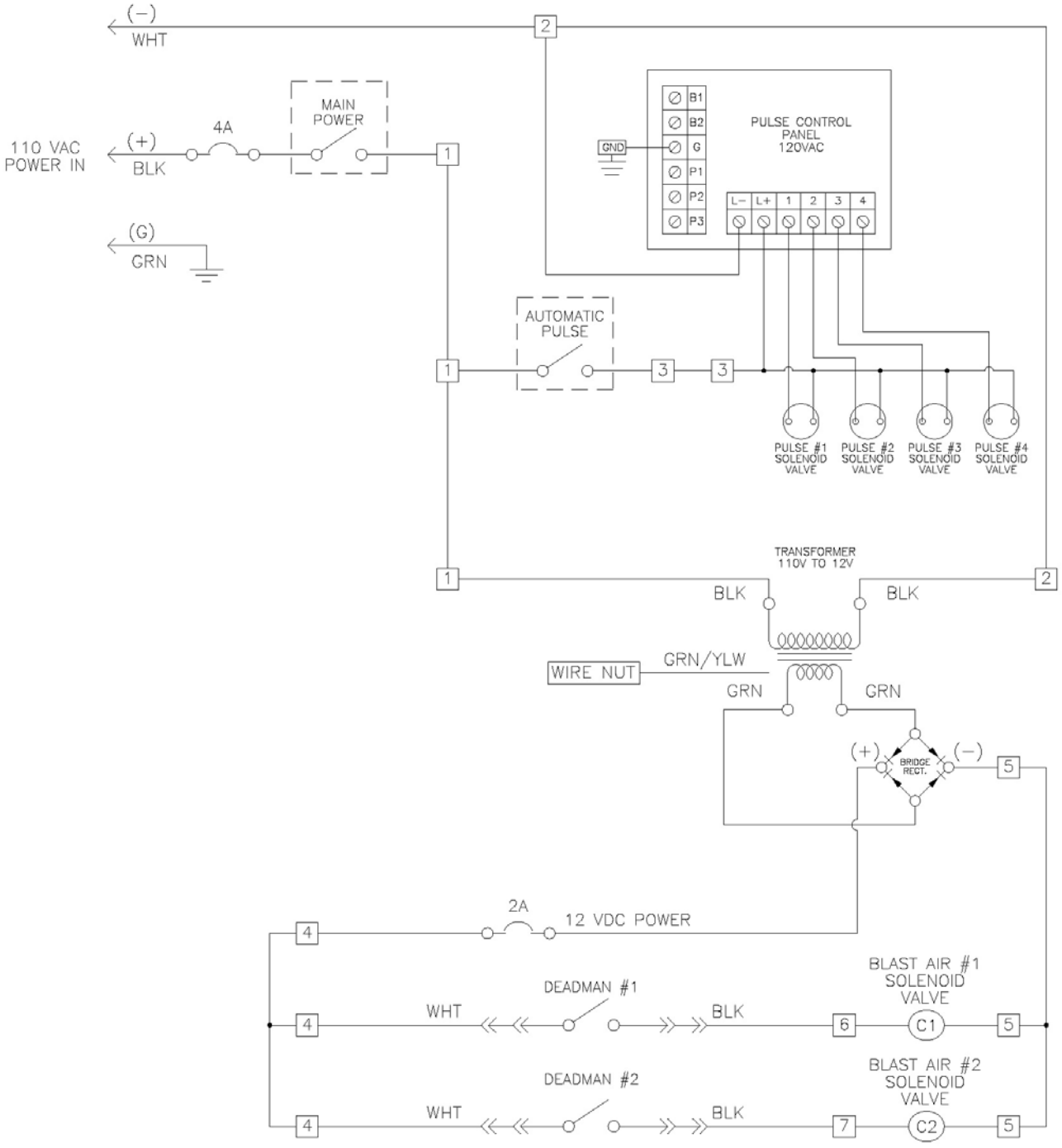
9.1(d) BRS2 Abrasive Blaster (Side View)



9.2 BRS2 Abrasive Blaster Pneumatic Schematic

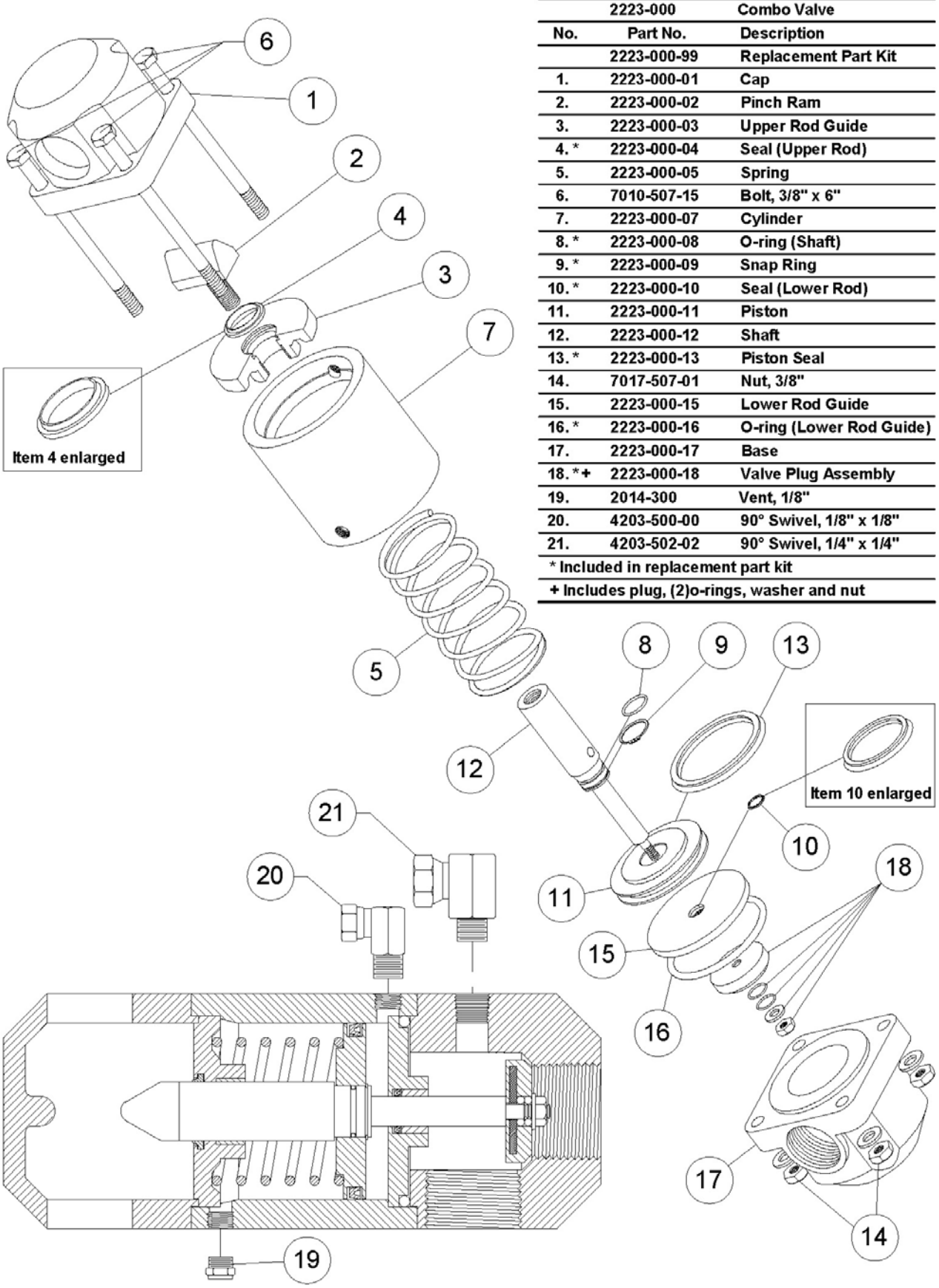


9.3 Vacuum System Control Box Electrical Schematic



9.4 Combo Valve®

	2223-000	Combo Valve
No.	Part No.	Description
	2223-000-99	Replacement Part Kit
1.	2223-000-01	Cap
2.	2223-000-02	Pinch Ram
3.	2223-000-03	Upper Rod Guide
4. *	2223-000-04	Seal (Upper Rod)
5.	2223-000-05	Spring
6.	7010-507-15	Bolt, 3/8" x 6"
7.	2223-000-07	Cylinder
8. *	2223-000-08	O-ring (Shaft)
9. *	2223-000-09	Snap Ring
10. *	2223-000-10	Seal (Lower Rod)
11.	2223-000-11	Piston
12.	2223-000-12	Shaft
13. *	2223-000-13	Piston Seal
14.	7017-507-01	Nut, 3/8"
15.	2223-000-15	Lower Rod Guide
16. *	2223-000-16	O-ring (Lower Rod Guide)
17.	2223-000-17	Base
18. *+	2223-000-18	Valve Plug Assembly
19.	2014-300	Vent, 1/8"
20.	4203-500-00	90° Swivel, 1/8" x 1/8"
21.	4203-502-02	90° Swivel, 1/4" x 1/4"
* Included in replacement part kit		
+ Includes plug, (2)o-rings, washer and nut		

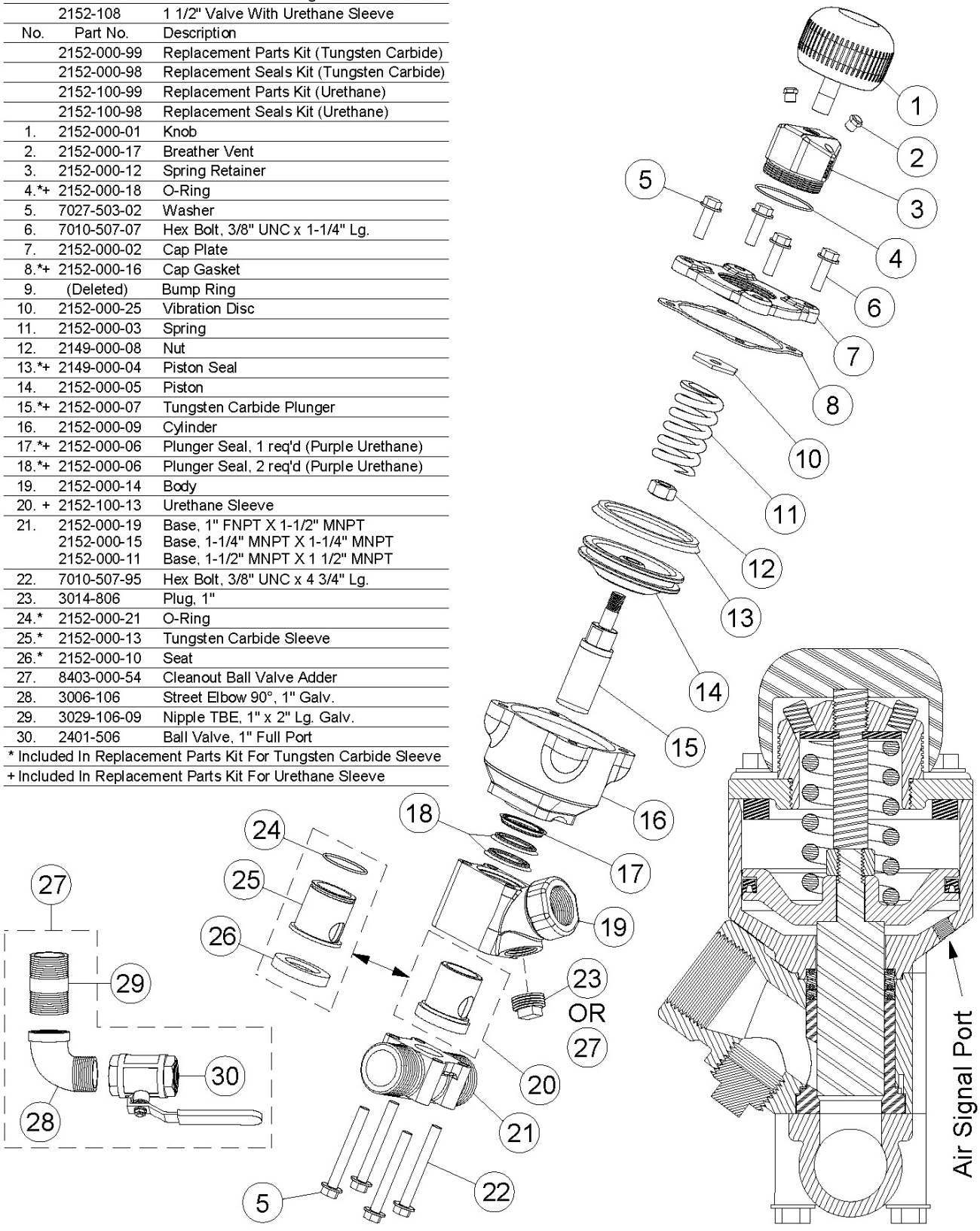


9.5 Thompson Valve® II

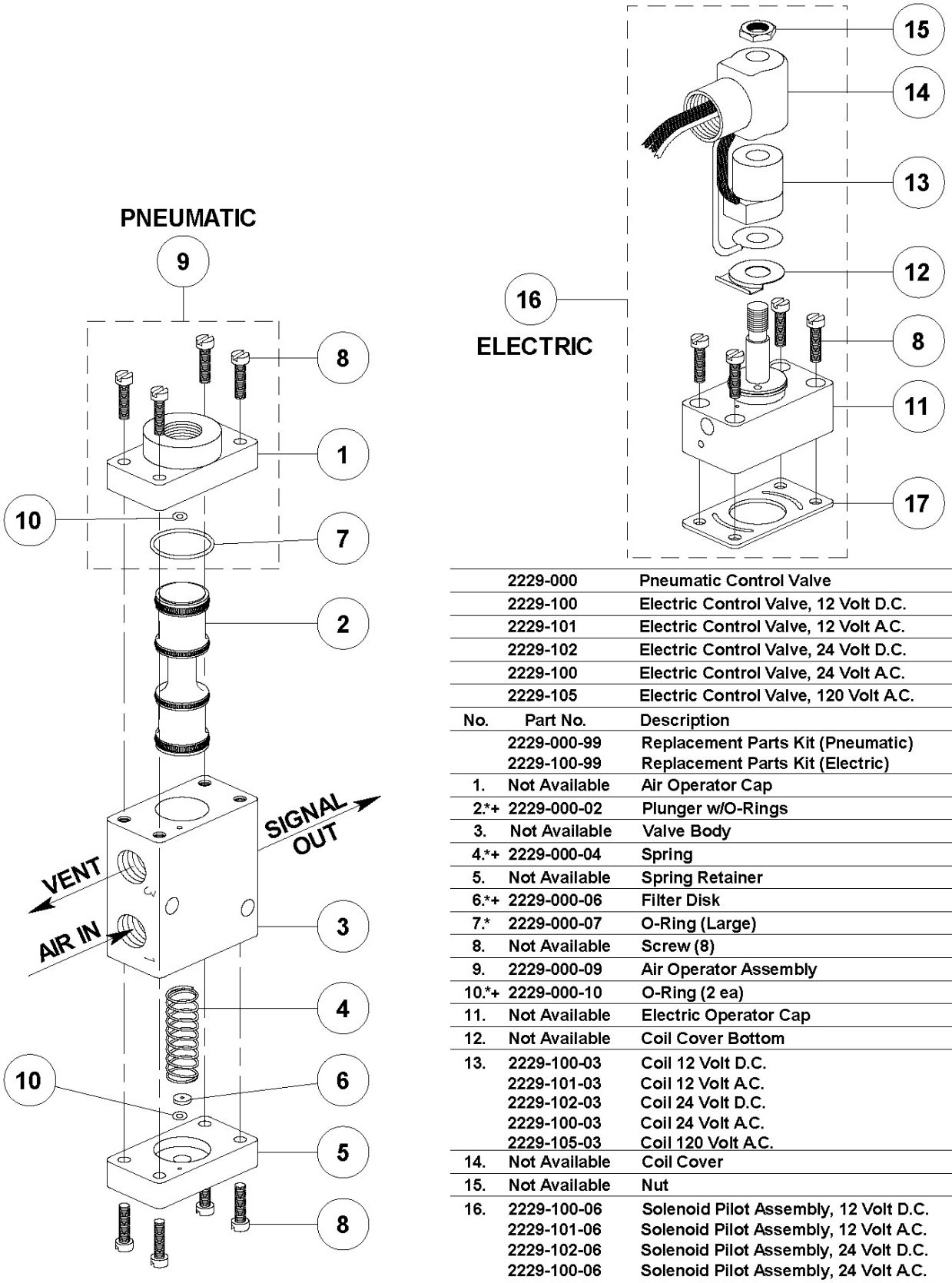
	2152-006	1" Valve With Tungsten Carbide Sleeve
	2152-106	1" Valve With Urethane Sleeve
	2152-007	1 1/4" Valve With Tungsten Carbide Sleeve
	2152-107	1 1/4" Valve With Urethane Sleeve
	2152-008	1 1/2" Valve With Tungsten Carbide Sleeve
	2152-108	1 1/2" Valve With Urethane Sleeve
No.	Part No.	Description
	2152-000-99	Replacement Parts Kit (Tungsten Carbide)
	2152-000-98	Replacement Seals Kit (Tungsten Carbide)
	2152-100-99	Replacement Parts Kit (Urethane)
	2152-100-98	Replacement Seals Kit (Urethane)
1.	2152-000-01	Knob
2.	2152-000-17	Breather Vent
3.	2152-000-12	Spring Retainer
4.*+	2152-000-18	O-Ring
5.	7027-503-02	Washer
6.	7010-507-07	Hex Bolt, 3/8" UNC x 1-1/4" Lg.
7.	2152-000-02	Cap Plate
8.*+	2152-000-16	Cap Gasket
9.	(Deleted)	Bump Ring
10.	2152-000-25	Vibration Disc
11.	2152-000-03	Spring
12.	2149-000-08	Nut
13.*+	2149-000-04	Piston Seal
14.	2152-000-05	Piston
15.*+	2152-000-07	Tungsten Carbide Plunger
16.	2152-000-09	Cylinder
17.*+	2152-000-06	Plunger Seal, 1 req'd (Purple Urethane)
18.*+	2152-000-06	Plunger Seal, 2 req'd (Purple Urethane)
19.	2152-000-14	Body
20. +	2152-100-13	Urethane Sleeve
21.	2152-000-19 2152-000-15 2152-000-11	Base, 1" FNPT X 1-1/2" MNPT Base, 1-1/4" MNPT X 1-1/4" MNPT Base, 1-1/2" MNPT X 1 1/2" MNPT
22.	7010-507-95	Hex Bolt, 3/8" UNC x 4 3/4" Lg.
23.	3014-806	Plug, 1"
24.*	2152-000-21	O-Ring
25.*	2152-000-13	Tungsten Carbide Sleeve
26.*	2152-000-10	Seat
27.	8403-000-54	Cleanout Ball Valve Adder
28.	3006-106	Street Elbow 90°, 1" Galv.
29.	3029-106-09	Nipple TBE, 1" x 2" Lg. Galv.
30.	2401-506	Ball Valve, 1" Full Port

* Included In Replacement Parts Kit For Tungsten Carbide Sleeve

\+ Included In Replacement Parts Kit For Urethane Sleeve



9.6 Control Valves (pneumatic and electric)



	2229-000	Pneumatic Control Valve
	2229-100	Electric Control Valve, 12 Volt D.C.
	2229-101	Electric Control Valve, 12 Volt A.C.
	2229-102	Electric Control Valve, 24 Volt D.C.
	2229-100	Electric Control Valve, 24 Volt A.C.
	2229-105	Electric Control Valve, 120 Volt A.C.
No.	Part No.	Description
	2229-000-99	Replacement Parts Kit (Pneumatic)
	2229-100-99	Replacement Parts Kit (Electric)
1.	Not Available	Air Operator Cap
2.*+	2229-000-02	Plunger w/O-Rings
3.	Not Available	Valve Body
4.*+	2229-000-04	Spring
5.	Not Available	Spring Retainer
6.*+	2229-000-06	Filter Disk
7.*	2229-000-07	O-Ring (Large)
8.	Not Available	Screw (8)
9.	2229-000-09	Air Operator Assembly
10.*+	2229-000-10	O-Ring (2 ea)
11.	Not Available	Electric Operator Cap
12.	Not Available	Coil Cover Bottom
13.	2229-100-03	Coil 12 Volt D.C.
	2229-101-03	Coil 12 Volt A.C.
	2229-102-03	Coil 24 Volt D.C.
	2229-100-03	Coil 24 Volt A.C.
	2229-105-03	Coil 120 Volt A.C.
14.	Not Available	Coil Cover
15.	Not Available	Nut
16.	2229-100-06	Solenoid Pilot Assembly, 12 Volt D.C.
	2229-101-06	Solenoid Pilot Assembly, 12 Volt A.C.
	2229-102-06	Solenoid Pilot Assembly, 24 Volt D.C.
	2229-100-06	Solenoid Pilot Assembly, 24 Volt A.C.
	2229-105-06	Solenoid Pilot Assembly, 120 Volt A.C.
17. +	2229-100-07	Gasket (Electric Only)
* Included In replacement parts kit-pneumatic		
+ Included In replacement parts kit-electric		

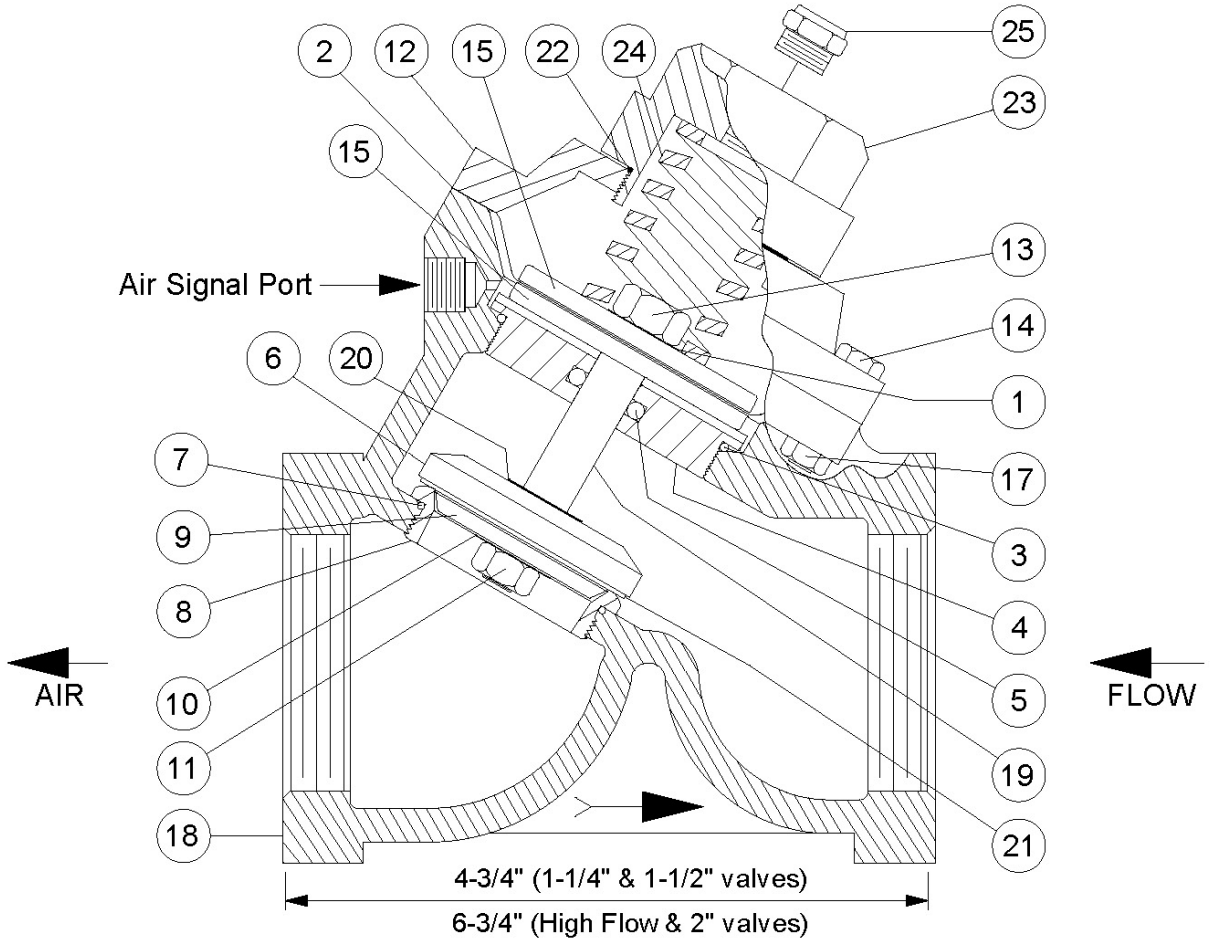
9.7 Automatic Air Valve (normally closed)

	2123-106	1" Valve
No.	Part No.	Description
	2123-006-99	Replacement Parts Kit
1.*	2123-006-01	Gasket
2.*	2123-006-02	Diaphragm
3.*	2123-006-03	O-ring
4.	2123-006-04	Retainer Bushing
5.*	2123-006-05	O-ring
6.	2123-006-06	Disk Retainer
7.*	2123-006-07	O-ring
8.	2123-006-08	Seat
9.	2123-006-09	Disc Plate
10.	"Deleted"	Lock Washer, Internal
11.*	2123-006-11	Lock Nut
12.	2123-106-12	Cap
13.*	2123-006-13	Hex Nut (w/thread lock)
14.	2123-006-14	Cap Screw
15.	2123-006-15	Diaphragm Plate
17.	2123-006-17	Lock Nut
18.	2123-006-18	Body, 1"
19.	2123-006-19	Shaft
20.*	2123-006-20	Gasket
21.*	2123-006-21	Disc
22.	2123-106-22	O-ring
23.	2123-106-23	Spring Retainer
24.	2123-106-24	Spring
25.	2014-300	Vent, 1/8"(not included)
* Included In Replacement Parts Kit		

	2123-107	1 1/4" Valve
	2123-108	1 1/2" Valve
No.	Part No.	Description
	2123-007-99	Replacement Parts Kit
1.*	2123-007-01	Gasket
2.*	2123-007-02	Diaphragm
3.*	2123-007-03	O-ring
4.	2123-007-04	Retainer Bushing
5.*	2123-007-05	O-ring
6.	2123-007-06	Disk Retainer
7.*	2123-007-07	O-ring
8.	2123-007-08	Seat
9.	2123-007-09	Disc Plate
10.	"Deleted"	Lock Washer, Internal
11.*	2123-007-11	Lock Nut
12.	2123-107-12	Cap
13.*	2123-007-13	Hex Nut (w/thread lock)
14.	2123-007-14	Cap Screw
15.	2123-007-15	Diaphragm Plate
17.	2123-007-17	Lock Nut
18.	2123-007-18	Body, 1 1/4"
	2123-008-18	Body, 1 1/2"
19.	2123-007-19	Shaft
20.*	2123-007-20	Gasket
21.*	2123-007-21	Disc
22.	2123-107-22	O-ring
23.	2123-107-23	Spring Retainer
24.	2123-107-24	Spring
25.	2014-300	Vent, 1/8"(not included)
* Included In Replacement Parts Kit		

**	2123-108L	1-1/2" High Flow Valve
No.	Part No.	Description
	2123-009-99	Replacement Parts Kit
1.*	2123-009-01	Gasket
2.*	2123-009-02	Diaphragm
3.*	2123-009-03	O-ring
4.	2123-009-04	Retainer Bushing
5.*	2123-009-05	O-ring
6.	2123-009-06	Disk Retainer
7.*	2123-009-07	O-ring
8.	2123-009-08	Seat
9.	2123-009-09	Disc Plate
10.	"Deleted"	Lock Washer, Internal
11.*	2123-009-11	Lock Nut
12.	2123-109-12	Cap
13.*	2123-009-13	Hex Nut (w/thread lock)
14.	2123-009-14	Cap Screw
15.	2123-009-15	Diaphragm Plate
17.	2123-009-17	Hex Nut (w/thread lock)
18.	2123-009-27	Body, 1-1/2" high flow
19.	2123-009-19	Shaft
20.*	2123-009-20	Gasket
21.*	2123-009-21	Disc
22.		Not Needed
23.	2123-109-23	Spring Retainer
24.	2123-109-24	Spring
25.	2014-300	Vent, 1/8"(not included)
* Included In Replacement Parts Kit		

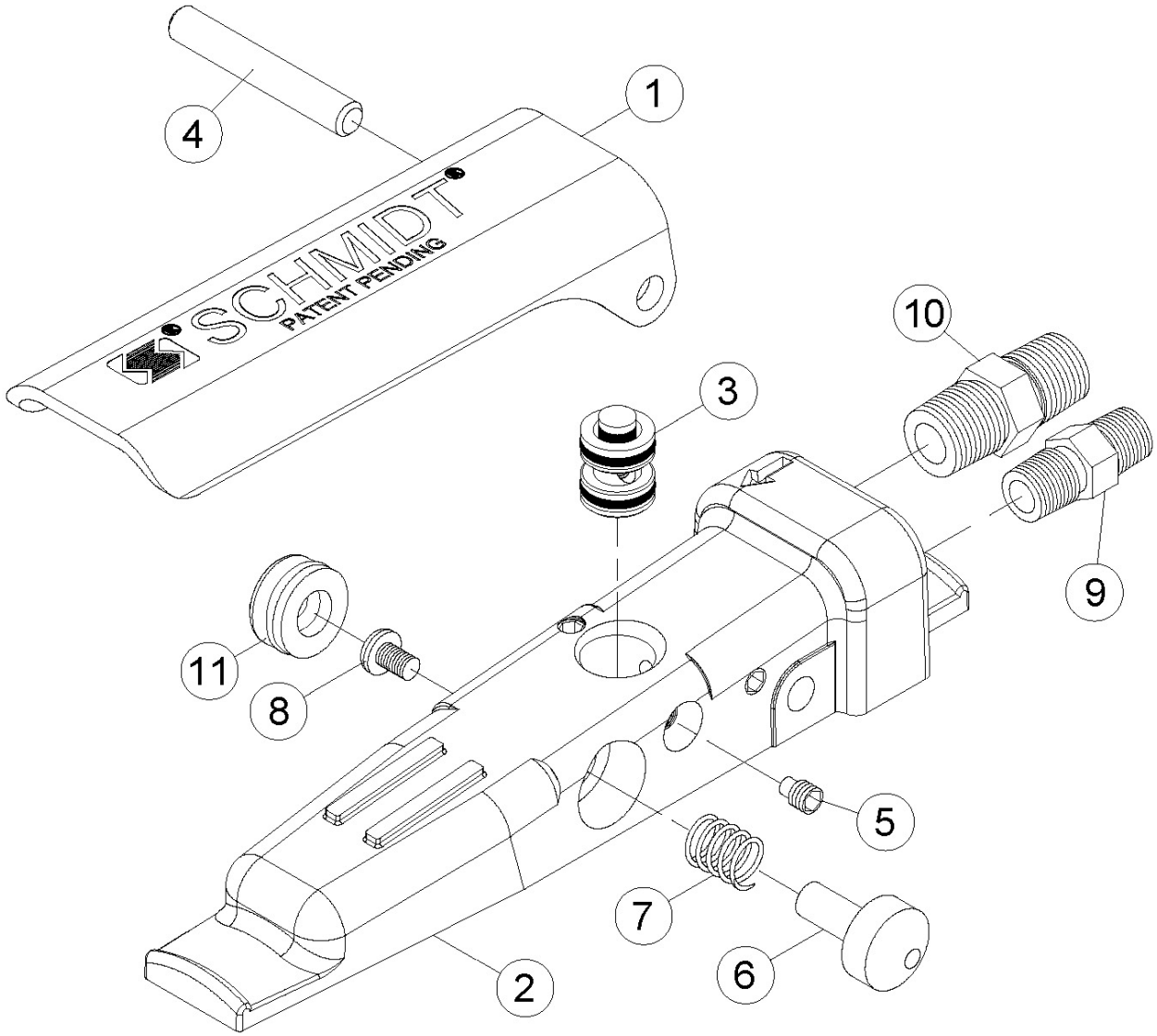
** 1-1/2" High Flow Valve is Optional On Units Manufactured After July 1, 2008



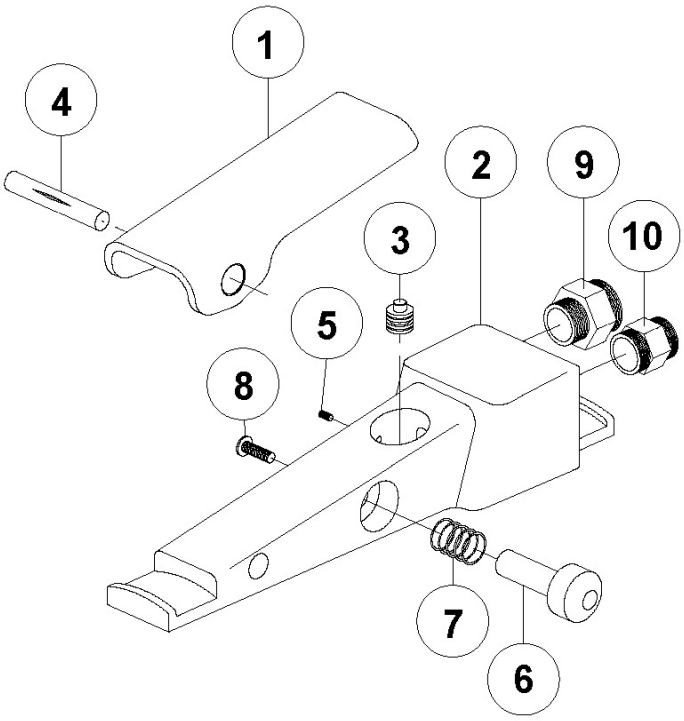
NOTE: With spring closed valve air flow is in opposite direction from arrow on valve body.

9.8(a) G2 Pneumatic Deadman

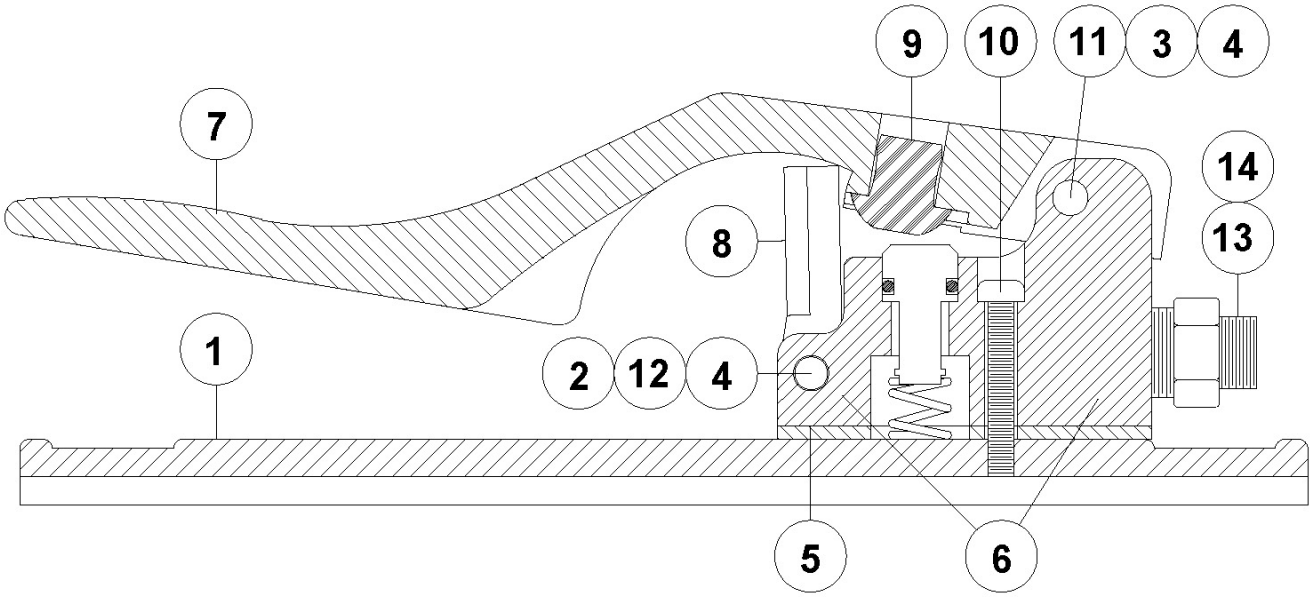
Item	Part No.	Description
	2263-002-99	G2 Replacement Parts Kit
1.	2263-002-01	G2 Deadman Lever
2.	2263-002-02	G2 Deadman Body
* 3.	2263-002-03	G2 Deadman Cartridge Assembly
4.	2263-002-04	G2 Deadman Hinge Pin
* 5.	2263-002-05	G2 Deadman Cartridge Set Screw
6.	2263-002-06	G2 Deadman Button
* 7.	2263-002-07	Deadman Spring
* 8.	2263-000-08	Deadman Screw For Button
9.	3031-300-00	Hex Nipple, 1/8" x 1/8" With Ball Seat
10.	3031-302-02	Hex Nipple, 1/4" x 1/4" With Ball Seat
*11.	2263-002-10	G2 Deadman Dust Plug
* Items included in Replacement Kit		



9.8(b) Deadman Valves (Pneumatic)

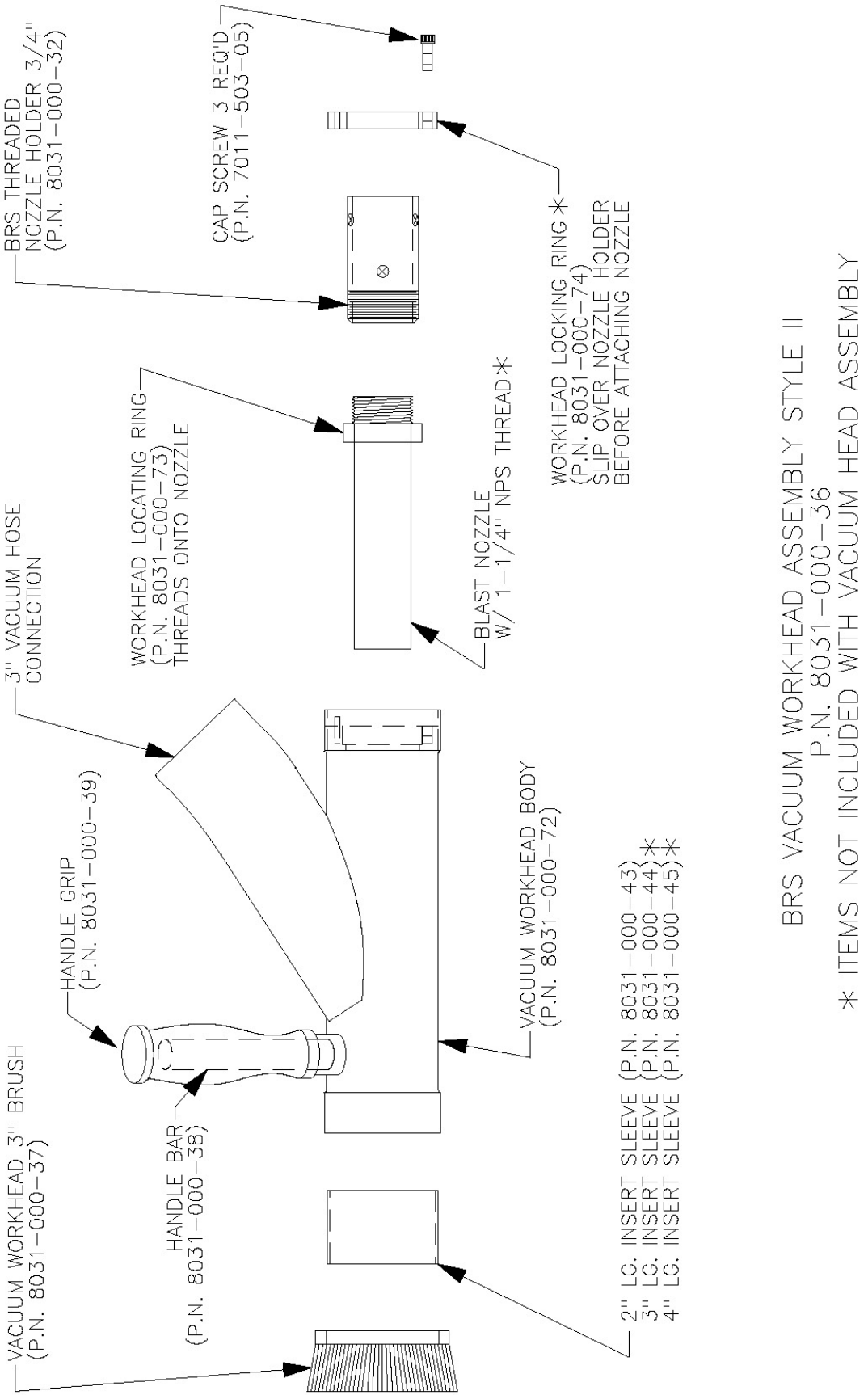


	2263-000	Pneumatic Deadman
No.	Part No.	Description
	2263-000-99	Replacement Parts Kit
1.	2263-000-01	Lever
2.	2263-000-02	Body
*3.	2263-000-03	Cartridge
4.	2263-000-04	Hinge Pin
*5.	2263-000-05	Set Screw
6.	2263-000-06	Safety Button
*7.	2263-000-07	Spring
*8.	2263-000-08	Screw for Button
9.	3031-302-00	Hex Nipple, 1/8" x 1/4"
10.	3031-300-00	Hex Nipple, 1/8" x 1/8"
* Included in replacement parts kit		



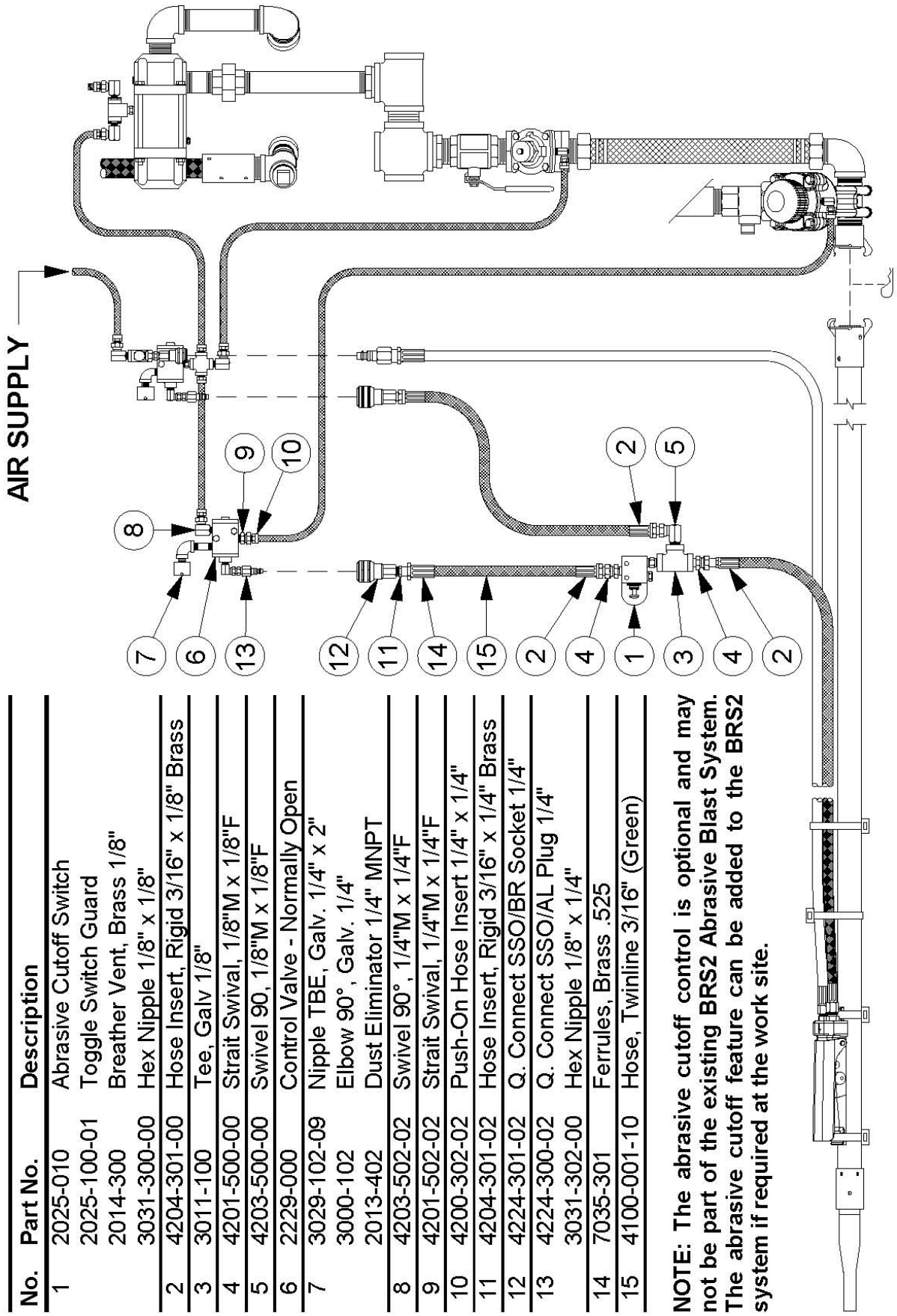
	2263-001	Pneumatic Deadman II			
No.	Part No.	Description	No.	Part No.	Description
	2263-001-99	Replacement Parts Kit Level I	8. +	2263-001-08	Safety Flap
	2263-001-98	Replacement Parts Kit Level II	9.*+	2263-001-09	Plunger Plug
1.	2263-001-01	Base	10.	2263-001-10	Body Mounting Screw
2. +	2263-001-02	Safety Flap Spring	11.	2263-001-11	Lever Spring
3. +	2263-001-03	Lever Hinge Screw	12. +	2263-001-12	Flap Hinge Screw
4.	2263-001-04	Hinge Pin Nut	13.	3031-302-00	Hex Nipple, 1/8" x 1/4"
5.*+	2263-001-05	Body Gasket	14.	3031-300-00	Hex Nipple, 1/8" x 1/8"
6.*+	2263-001-06	Valve Body Assembly	* Included in replacement parts kit, Level I		
7.	2263-001-07	Lever	+ Included in replacement parts kit, Level II		

9.9 Vacuum Head Assembly



BRS VACUUM WORKHEAD ASSEMBLY STYLE II
P.N. 8031-000-36
* ITEMS NOT INCLUDED WITH VACUUM HEAD ASSEMBLY

9.10 Remote Abrasive Cut-off (Pneumatic)



No.	Part No.	Description
1	2025-010	Abrasive Cutoff Switch
	2025-100-01	Toggle Switch Guard
	2014-300	Breather Vent, Brass 1/8"
	3031-300-00	Hex Nipple 1/8" x 1/8"
2	4204-301-00	Hose Insert, Rigid 3/16" x 1/8" Brass
3	3011-100	Tee, Galv 1/8"
4	4201-500-00	Strait Swival, 1/8"M x 1/8"F
5	4203-500-00	Swivel 90, 1/8"M x 1/8"F
6	2229-000	Control Valve - Normally Open
7	3029-102-09	Nipple TBE, Galv. 1/4" x 2"
	3000-102	Elbow 90°, Galv. 1/4"
	2013-402	Dust Eliminator 1/4" MNPT
8	4203-502-02	Swivel 90°, 1/4"M x 1/4"F
9	4201-502-02	Strait Swival, 1/4"M x 1/4"F
10	4200-302-02	Push-On Hose Insert 1/4" x 1/4"
11	4204-301-02	Hose Insert, Rigid 3/16" x 1/4" Brass
12	4224-301-02	Q. Connect SSO/BR Socket 1/4"
13	4224-300-02	Q. Connect SSO/AL Plug 1/4"
	3031-302-00	Hex Nipple 1/8" x 1/4"
14	7035-301	Ferrules, Brass .525
15	4100-001-10	Hose, Twinline 3/16" (Green)

NOTE: The abrasive cutoff control is optional and may not be part of the existing BRS2 Abrasive Blast System. The abrasive cutoff feature can be added to the BRS2 system if required at the work site.

10.0 Recommended Spare Parts List

ITEM	QTY	PART #	DESCRIPTION
12	2	2123-007-02	1 1/4" & 1 1/2" Auto Air Valve Diaphragm
12	3	2123-007-99	1 1/4" & 1 1/2" Auto Air Valve Replacement Part Kit
12	1	2123-108	1 1/2" Auto Air Valve
12	3	2123-107-24	1 1/4" & 1 1/2" Auto Air Valve Spring
12	2	2014-300	Breather Vent, 1/8”
66	2	2013-402	Dust Eliminator, 1/4"
14	2	2152-000-03	Thompson Valve® II Spring
14	1	2152-000-09	Thompson Valve II Cylinder
14	1	2152-000-11	Thompson Valve II Base
14	2	2152-XXX-99	Thompson Valve II Replacement Parts Kit (specify urethane or carbide)
14	1	2152-XXX	1 1/2" Thompson Valve II (specify urethane or carbide sleeve)
3	1	2401-502	1/4" Ball Valve
14	1	2401-507	1 1/4" Ball Valve (see Section 9.5)
1	1	2401-509	2" Ball Valve
65	1	4211-109	2" 4-Lug Crowfoot, Female
65	10	4211-999	Gasket, 4-Lug Crowfoot
11	1	2401-508	1 1/2" Ball Valve
5	1	2000-003-99	Slave regulator replacement parts
5	1	2001-011-99	Pilot regulator replacement parts kit
18	1	7000-001-11	Handway Crab Assembly, 6" x 8"
18	1	7000-001-06	Handway Gasket, 6” x 8”
70	20	4214-999	Hose Coupling Gasket
N/A	20	4205-108-99	Insert Gasket
71	20	7119-002	Safety Pin, Air/Blast Hose Coupling
N/A	1	7031-999-09A	Decal Kit (see Section 0.0)
15	2	2229-000	Pneumatic Control Valve
15	4	2229-000-99	Pneumatic Control Valve Replacement Parts Kit
17	2	2263-400	Electric Deadman Valve
16	2	7074-055	Extension Cord, 55ft.
55	2	7109-301	Electric plug, 3 prong male, twist lock
55	2	7109-300	Electric connector, 3 prong female, twist lock
8	1	2223-000	Combo Valve
8	1	2223-999	Combo Valve replacement parts kit
8	1	2223-000-18	Combo Valve plug assembly
7	1	4115-005-06	Blowdown hose, 3/4" x 6 ft
9	1	2100-011	Popup gasket
10	1	2100-010	Popup with stem
4	1	2010-009-01	Pressure gauge, 0-160 psi
59	1	2010-026	Pressure gauge, 30 Hg vac-0-15 psi
32	1	8082-000-24	Dust collector door gasket
13	1	2408-907	1-1/4” Union end ball valve
22	1	2302-206-99	Air filter replacement parts kit
30	4	8031-000-24	Dust collector filter
28	2	8032-000-58	Pulse valve, 1”
41	2	8032-000-45	Pulse control valve, 120Vac
48	4	5000-XXX	Blast nozzle (specify size and type)
49	2	4104-40X-XX	Blast hose assembly (specify size)
68	3	8407-000-10	Vacuum system drive belt
26	1	2015-013P	Eductor Body Cast Iron 4”
26	1	2015-513-02	Eductor Nozzle 4” 550 CFM
73	1	7070-015	Coupling, Rubber Boot 6”

11.0 Troubleshooting

This section lists probable causes of problems that may occur during operation of the abrasive blaster. Not all of the "probable causes" may apply to your particular abrasive blaster. The probable cause may not apply because of the control type and accessories on the abrasive blaster. Refer to Figure 11.1 and the drawings in Section 9.0.

⚠ DANGER

The BRS2 abrasive blaster is a Pressurized Vessel. Propelled objects will cause serious injury or death. Depressurize vessel before performing any maintenance. See Section 6.2.

11.1 Malfunction With Deadman Lever In The "Off" Position

11.1.1. Blast air stops but abrasive will not shut off

(1) Trash stuck between plunger and seat in Thompson Valve® (#14).
(2) Defective valve plunger in Thompson Valve (#14).
(3) Defective sleeve in Thompson Valve (#14).
(4) Blocked air hose to Thompson Valve (#14).
(5) Defective spring in Thompson Valve (#14) (check length of spring).
(6) Thompson Valve cap (or spring retainer) not screwed all the way down (hand tighten only).

11.1.2. Abrasive stops but blast air will not shut off

(1) Defective spring in automatic air valve (#12).
(2) Defective seat in automatic air valve (#12).
(3) Blocked air hose to automatic air valve (#12).
(4) Defective o-ring in automatic air valve (#12) (around shaft).

11.1.3. Both blast air and abrasive will not shut off

(1) Control lines to deadman valve (#17) are crossed.
(2) Non-Schmidt deadman (#17) has been installed.
(3) Control valve (#15) stuck in the "ON" position.
(4) Blocked control lines.
(5) Defective deadman valve (#17). Pneumatic deadman cartridge plunger stuck in the "ON" position (down). Cartridge plunger is visible below deadman handle.

11.1.4. Blast outlet turns on accidentally

(1) The deadman lever (#17) is worn out.
(2) The safety button on the deadman is missing. See drawings in Section 9.8.
(3) A bleeder type deadman valve has been installed. A bleeder type deadman valve *is not safe* because a particle of dirt from the air hose can plug the bleed hole and cause the blast outlet to turn on. See *Warnings* and *Rules for Safer Operation* in Section 1.0.
(4) Defective electric deadman switch or electric wiring (check for an electric short).

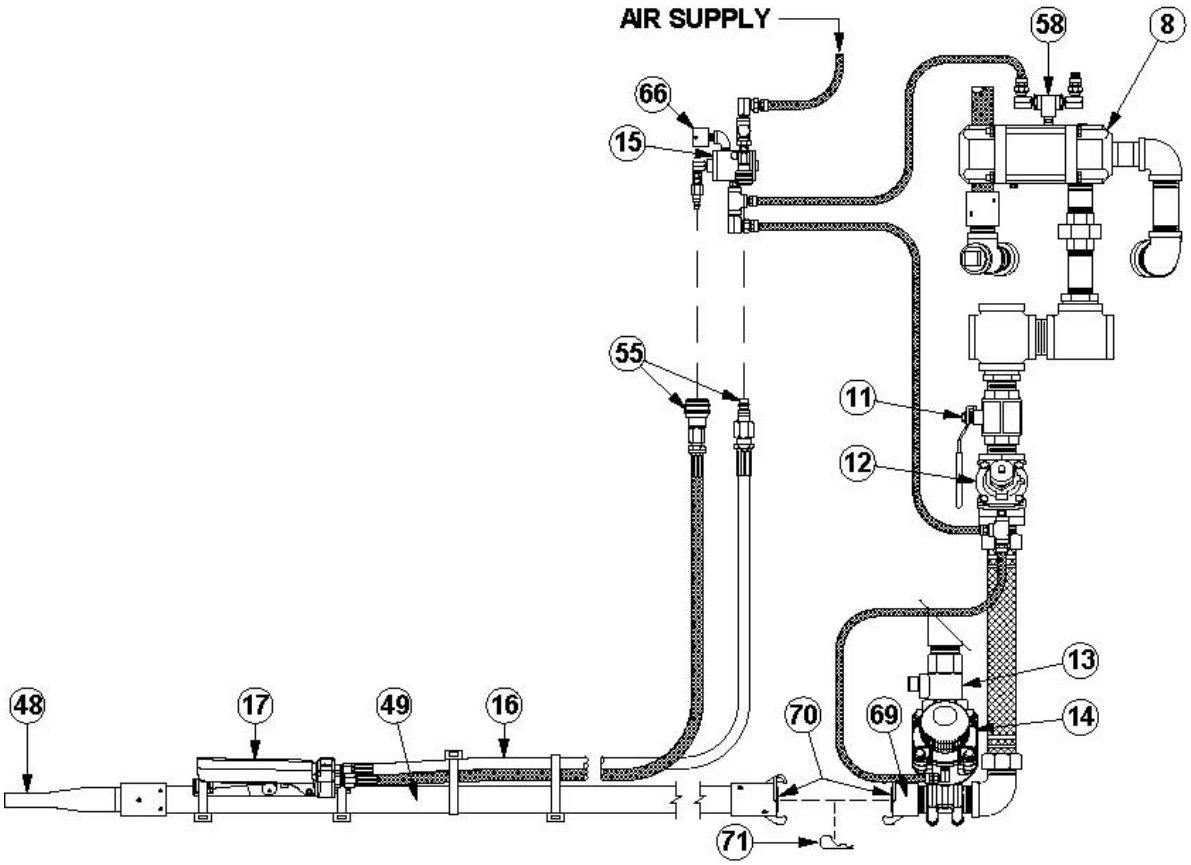


Figure 11.1 – Typical BRS2 Abrasive Blast System

11.2 Malfunction With Deadman Lever In The "On" Position

11.2.1. Air blasts with no abrasive

(1) Check abrasive level in the blast vessel even if one outlet continues to blast normally.
(2) Blocked control hose to Thompson Valve® (#14).
(3) Thompson Valve plunger stuck in closed position.
(4) Trash plugging opening from tank to Thompson Valve (#14). See Section 11.3.
(5) Insufficient air pressure to open Thompson Valve (fully open requires 80 psig).
(6) Abrasive flow problems. See Section 11.3.
(7) Defective Thompson Valve piston seal (air will leak from breather).
(8) Blast vessel leaks causes reverse differential pressure slowing abrasive flow.

11.2.2. Abrasive choking out of blast hose with low blast air pressure.

(1) Thompson Valve abrasive adjustment knob (#14) is open too far.
(2) Control hose to automatic air valve (#14) is blocked.
(3) Choke valve (#11) is partially closed.
(4) Low air compressor output cfm (unit may cycle on and off). See Section 3.0.
(5) Blocked automatic air valve breather vent (#12).

11.2.3. Reduced Pressure At The Nozzle (with or without abrasive flow)

(1) Low air compressor output cfm. See Section 3.0 for air requirements.
(2) Air hose too small.
(3) Thompson Valve abrasive adjustment knob (#14) is open too far.
(4) Check for leaks in blast vessel or control piping.
(5) Choke valve (#11) is partially closed.
(6) Trash may be partially plugging the nozzle orifice (#48).
(7) Blocked automatic air valve breather vent (#12).

11.2.4. Blast is slow to turn on or will not turn on when deadman lever is pressed down.

(1) Check quick couplings (#55) on control hoses to see if they are connected properly.
(2) Control valve (#15) stuck in exhaust position.
(3) 1/4" strainer (#3) blocked.
(4) Control hoses blocked.
(5) Cartridge in deadman valve (#17) is blocked.
(6) Low air compressor output cfm (unit may cycle on and off). See Section 3.0.
(7) Air leaks in control hose from the deadman valve (#17) to control valve (#15).
(8) Trash blocking nozzle orifice.
(9) Blocked automatic air valve breather vent (#12).

11.3 Notes on Abrasive Flow Problems

11.3.1. Thompson Valve® operation

If abrasive flow is a problem, remember; the Thompson Valve only opens and closes. The total travel to full open is approximately 3/4 of an inch. This can be quickly checked with the adjustment knob on the abrasive valve.

For this procedure close the choke valve (#11) and the abrasive shut-off valve (#13) to prevent blasting. This test is to verify that the Thompson Valve is opening.

With the deadman off, screw the Thompson Valve knob down until it stops. Notice that the knob turns easily when the deadman is off. Next, back the knob out 3/4 of an inch or slightly less, then press the deadman lever down to open the Thompson Valve. The knob should get tight or more difficult to turn because the valve has opened against the adjustment. This guarantees that the valve is fully open. If the material will not flow with the valve fully open, you have an abrasive flow problem, not a problem with the Thompson Valve. The abrasive may be wet, or there may be trash blocking the opening. Try choking the blast outlet to clear the opening. Proceed to step 11.3.2. If the knob does not get tighter during this test troubleshoot the controls and the Thompson Valve piston seal.

⚠ DANGER

Do Not hammer on any part of the pressure vessel to improve abrasive flow. This will cause cracks that may lead to pressure vessel rupture.

11.3.2. Choking the blast outlet

The choke valve (#11) is used to clear any trash that may get into the blast vessel and block the Thompson Valve orifice. When trash (paint chip, cigarette butt, etc.) blocks the Thompson Valve orifice, the procedure is to fully open the Thompson Valve knob, then press down the deadman lever (#17) to begin blasting. While blasting, have an assistant close the choke valve completely for about one second. This creates differential pressure at the Thompson Valve (high pressure above; low pressure below). The higher pressure from the blast vessel should be enough to loosen the trash blocking the Thompson Valve orifice and blast it through the blast nozzle (#48). To prevent excess wear of the Thompson Valve keep the choke valve fully open during normal blasting. If the blaster is equipped with the abrasive cut-off feature set the valve (or switch) to the on-position for the choke procedure. See Section 9.10.

Note: The Thompson Valve II has a cleanout port to use for this procedure. See the Thompson Valve II drawing in Section 9.5 (Item 27).

11.3.3. Blast control hoses

Remember, the blaster controls and valves are normally closed. Therefore, the control hoses are depressurized to turn the blast off and pressurized to turn the blast on. If a needle gauge is available, it is the quickest way to check to see if there is pressure or not. If no needle gauge is available, disconnect each control hose fitting one at a time until the problem is located.

12.0 Warranty and Reference Information

12.1 Warranty

This following section is to be used as a guide in determining warranty policies and procedures for SCHMIDT® products. It is to be used in determining whether a warranty is justified and as a procedural guide in completing a SCHMIDT warranty claim.

12.2 Warranty Policy

1. All SCHMIDT products are guaranteed to be free of defects in material and workmanship at time of shipment. Axxiom Manufacturing, Inc. warrants its products against defects in material and workmanship under normal and proper use for a period of ninety (90) days from the date of delivery. Such warranty is extended only to the buyer who purchases the equipment directly from Axxiom Manufacturing, Inc. or its authorized distributors. This warranty does not include expendable parts such as, but not limited to, hoses, nozzles, and seals.

2. The obligation under this warranty is strictly limited to the replacement or repair, at Axxiom's option, of machines and does not include the cost of transportation, loss of operating time, or normal maintenance services. Axxiom Manufacturing, Inc. shall have no liability for labor, consequential damages, freight or special charges.

3. This warranty does not apply to failure occurring due to abuse, misuse, negligence, corrosion, erosion, normal wear and tear, alterations or modifications made to the machine without express written consent of Axxiom Manufacturing, Inc.

4. Warranty requests must be submitted in writing within thirty (30) days after failure.

5. Written authorization to return merchandise under warranty must first be obtained from Axxiom Manufacturing, Inc. In no case is merchandise to be returned to Axxiom for credit without authorization. At the time of authorization, Axxiom will issue a return authorization number that must be included on all packages and correspondence. Any material returned without prior authorization will remain the property of the sender and Axxiom will not be responsible for it.

6. All returns must be shipped prepaid freight. All returns may be exchanged for other equipment or parts of equal dollar value. If goods are not exchanged, they are subject to a 20% restocking charge. Any cost incurred by Axxiom Manufacturing, Inc. to restore such goods to first class condition will be charged to the customer.

7. Axxiom Manufacturing, Inc. reserves the right to inspect and make the final decision on any merchandise returned under warranty.

8. Axxiom Manufacturing, Inc. offers no warranty with respect to accessories, including but not limited to, engines, motors, batteries, tires and any other parts not manufactured by Axxiom Manufacturing, Inc., but which the original manufacturer warrants.

9. Axxiom Manufacturing, Inc. reserves the right to make product changes or improvements without prior notice and without imposing any obligation upon itself to install the same on its products previously sold.

10. The above warranty conditions can only be altered by Axxiom Manufacturing, Inc. Axxiom must confirm alterations in writing for each specific transaction.

11. Axxiom Manufacturing, Inc. reserves the right to establish specific warranty terms for used or demo machines on an individual transaction basis. Invoices covering such merchandise will clearly state the provisions of the applicable warranty for each specific transaction.

12. USE OF NON-ORIGINAL SCHMIDT® FACTORY REPLACEMENT PARTS ON ANY SCHMIDT EQUIPMENT VOIDS ALL WARRANTIES.

13. AXXIOM MANUFACTURING, INC. DOES NOT AUTHORIZE ANY PERSON, REPRESENTATIVE OR SERVICE OR SALES ORGANIZATION TO MAKE ANY OTHER WARRANTY OR TO ASSUME ON BEHALF OF AXXIOM MANUFACTURING, INC. ANY LIABILITY IN CONNECTION WITH THE SALE OF OUR PRODUCTS OTHER THAN THOSE CONTAINED HEREIN.

14. UNDER NO CIRCUMSTANCES SHALL AXXIOM MANUFACTURING, INC. BE LIABLE TO CUSTOMER OR ANY OTHER PERSON FOR ANY DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF ANY WARRANTY OR FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY CHARACTER, INCLUDING WITHOUT LIMITATIONS, DAMAGES FOR ANY LOSS OF GOODWILL, WORK STOPPAGE, OR ANY AND ALL OTHER COMMERCIAL DAMAGES OR LOSSES.

15. AXXIOM MANUFACTURING, INC. MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE SCHMIDT PRODUCTS SOLD PURSUANT THERETO.

12.3 Trademarks, Patents, and Proprietary Statements

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Products manufactured and marketed by Axxiom Manufacturing, Inc. are protected by patents issued or pending in the United States and other countries.

The text, diagrams, and drawings contained in this manual are proprietary information intended solely for instruction in the operation of the specified equipment. Use of any text, diagrams, or drawings contained in this manual for any reason other than its intended purpose without the written consent of Axxiom Manufacturing, Inc. is strictly prohibited.

12.4 Safety Information Sources

Axxiom Manufacturing, Inc
This equipment and all Schmidt® equipment are manufactured exclusively by Axxiom Manufacturing, Inc. If any operational or safety related questions arise relating to this equipment contact Axxiom Manufacturing, Inc.

Phone: 1-800-231-2085
Website: www.axxiommfg.com

Axxiom Manufacturing, Inc.
11927 South Highway 6
Fresno, Texas 77459

Occupational Safety and Health Administration (OSHA) establishes and enforces regulations regarding safety practices in the workplace including the abrasive blasting industry. Any questions, reporting of work related injuries, or reporting of unsafe work practices can be made to the following contact information. Answers to most any safety related questions can be found at the OSHA website shown below.

Phone: 1-800-321-6742
Website: www.osha.gov

U.S. Department of Labor
Occupational Safety and Health Administration
200 Constitution Avenue
Washington D.C. 20210

National Institute of Occupational Safety and Health (NIOSH) is a federal agency responsible for conducting research and recommendations for the prevention of work related injuries and sickness.

Phone: 1-800-356-4674
Website: www.cdc.gov/niosh

National Institute of Occupational Safety and Health
Hubert H. Humphrey Bldg.
200 Independence Avenue, SW
Room 715H
Washington, DC 20201

American National Standards Institute (ANSI) coordinates the development and use of voluntary consensus standards including safety standards.

Phone: 1-202-293-8020
Website: www.ansi.org

American National Standards Institute
1819 L Street, NW
6th Floor
Washington, DC 20036

12.5 Surface Preparation Information Sources

The Society for Protective Coatings (SSPC) consists of research and testing committees, conducts seminars and establishes industry standards on surface preparation methods, abrasive and coatings.

Phone: 1-412-281-2331
Website: www.sspc.org

The Society for Protective Coatings
40 24th Street
Pittsburg, PA 15222-4643

National Association of Corrosion Engineers (NACE) develops test methods and recommended practices on surface preparation techniques and coatings.

Phone: 1-281-228-6200
Website: www.nace.org

National Association of Corrosion Engineers
1440 South Creek Drive
Houston, TX 77084

12.6 Table of Blast Abrasive Characteristics

Abrasive Type	Hardness (Mohs)	Grain Shape	Density Lbs/ft3	Color	Free Silica Content	No. of Recycles	Initial Cost	Typical Use
Corn Cobs	2	angular	35-45	tan	none	4-5	low	stripping paint from delicate substrates
Sodium Bicarbonate	2.8	crystal	60	white	none	4-5	medium	cleaning and stripping paint from delicate substrates
Walnut Shell	3	angular	45	lt. brown	none	4.5	low	stripping paint from delicate substrates
Plastic	3.2	angular	45-60	white	none	8-10	medium	Paint stripping, deburring, and cleaning
Glass Beads	4.5	spherical	90	crystal	none	8-10	low	cleaning finishing
Starblast XL	6.5	spherical	100	lt. brown	<1%	4-5	medium	outdoor blasting
Coal Slag	7	angular	85	black	none	1-2	medium	outdoor blasting
Copper Slag	7	angular	112	black	none	1-2	medium	outdoor blasting
Garnet	7	angular	147	pink	<2%	4-5	medium	outdoor blasting
Steel Shot	8	spherical	280	steel grey	none	200	low	cleaning and peening
Steel Grit	8	angular	280	steel grey	none	200	medium	removing heavy scale
Aluminum Oxide	9	angular	120	brown	<1%	6-8	medium	cleaning and finishing, deburring and etching

13.0 Blasting Data

13.1 Table 1 Approximate Air Consumption (cfm) Per Blast Nozzle

	NOZZLE PRESSURE						
NOZZLE SIZE	**60 psi**	**70 psi**	**80 psi**	**90 psi**	**100 psi**	**120 psi**	**140 psi**
No.2 1/8"	14	16	18	20	22	26	30
No.3 3/16"	32	36	41	45	49	58	66
No.4 1/4"	57	65	72	80	90	105	121
No.5 5/16"	90	101	113	125	140	160	185
No.6 3/8"	126	145	163	182	200	235	270
No.7 7/16"	170	193	215	240	270	315	360
No.8 1/2"	230	260	290	320	350	410	470
No.10 5/8"	360	406	454	500	550	640	740
No.12 3/4"	518	585	652	720	790	925	1060

13.2 Table 2 Abrasive Consumption (lbs. per hour) Per Blast Nozzle

	NOZZLE PRESSURE						
NOZZLE SIZE	**60 psi**	**70 psi**	**80 psi**	**90 psi**	**100 psi**	**120 psi**	**140 psi**
No.2 1/8"	90	105	115	130	140	165	190
No 3 3/16"	205	230	260	290	320	375	430
No.4 1/4"	365	420	460	500	560	660	760
No.5 5/16"	575	650	725	825	900	1050	1200
No.6 3/8"	840	945	1050	1155	1260	1475	1700
No.7 7/16"	1150	1300	1450	1600	1750	2050	2350
No.8 1/2"	1460	1660	1850	2000	2250	2650	3000
No.10 5/8"	2290	2600	2900	3125	3520	4100	4750
No.12 3/4"	3300	3750	4180	4500	5060	5950	6800

13.3 Table 3 Hose Selection Guide (blasting @ 100 Psi)

NOZZLE SIZE	**No.4 1/4"**	**No.5 5/16"**	**No.6 3/8"**	**No.7 7/16"**	**No.8 1/2"**
CFM @ 100psi	90	140	200	270	350
AIR HOSE	1 1/4"	1 1/4"	1 1/2"	1 1/2"	2"
BLAST HOSE	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"
ABRASIVE (lbs per hr)	560	900	1260	1750	2250

13.4 Additional Information on Blasting Productivity

Air volume and pressure are very important. The blasting production rate will increase with higher blasting pressures and decrease with lower blasting pressures. The National Association of Corrosion Engineers' data suggests that for each 1 psi reduction in nozzle pressure, there is a 1.5% production loss. Pressure drop through a Schmidt® blast unit is normally less than 1 psi, while blast units manufactured by some of our competitors have pressure losses as high as 12 psi resulting in an 18% loss of production. Air pressure loss can also be avoided by using the shortest possible hose of adequate size. The inside diameter of both the blast hose (other than whip hose) and the air hose should be approximately three times the diameter of the orifice in the blast nozzle.

Standard Schmidt blast units are rated for a maximum pressure of 125 psi although high pressure units rated for 150 psi are available on request.