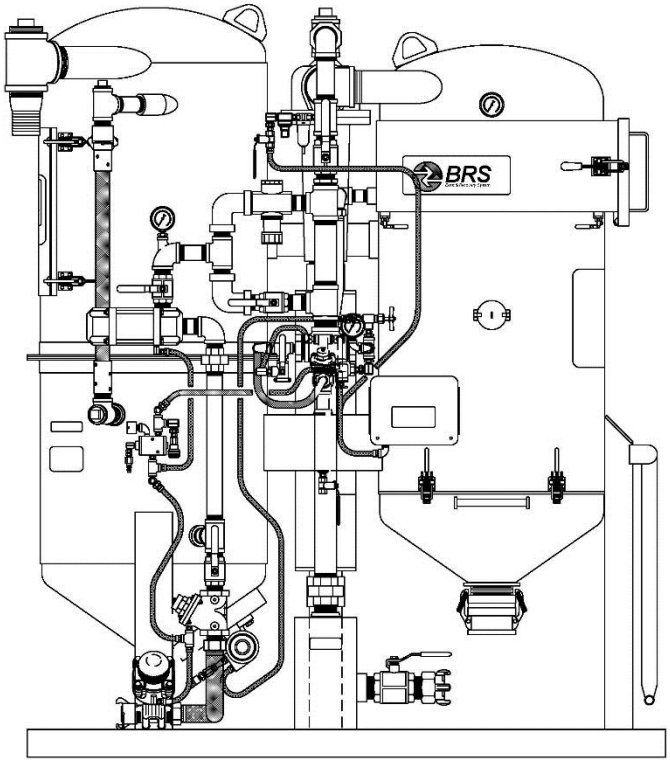
BRS Blast and Recovery System

OPERATION AND MAINTENANCE MANUAL

JUNE 2017



SCHMIDT®

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

Manual Part Number 7200-220
(Scan QR tag below for downloading from SchmidtAbrasiveBlasting.com)

AXXIOM MANUFACTURING, INC.™
engineered abrasive systems

SCHMIDT®

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

Visit us at www.SchmidtAbrasiveBlasting.com

Website

Manual

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. All operators 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 a Schmidt® abrasive blaster. Read this entire operations and maintenance manual before using the 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 operators of the possible hazards and explain how to avoid them. The safety symbols and explanations alone do not 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 operators understand the procedures and instructions given in this manual. All operators must be familiar 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”.)
Depressurized System	An abrasive blaster that is pressurized only when the deadman activates the blast operation. The blaster automatically depressurizes when the deadman is released.
Pressurized System	An abrasive blaster that is automatically pressurized when the air inlet ball valve is opened. The blaster remains pressurized when the deadman is released.
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 for the locations of these warning decals on the Abrasive Blaster.

No.	Qty.	Part no.	Description	Hazard
1.	2	7031-001	Medium "Schmidt"	No associated hazard.
2.	2	7031-020	"BRS"	No associated hazard.
3.	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.
4.	2	7031-007B	"Danger" Pressurized vessel.	Propelled objects will cause serious injury or death. Depressurize vessel prior to performing any maintenance. See Section 6.2.
5.	1	7031-017	"Inlet"	No associated hazard.
6.	1	7031-008	"Warning" "Properly Grounding"	For safety, this unit must be properly grounded. Refer to operations manual for procedure. See Section 1.20 and 5.14.
7.	1	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.
8.	1	7031-077	"Warning" "Pinch Point Hazard"	Vessel pressurization will close popup. Closing popup can pinch and crush. Keep hands and fingers away from popup.
9.	1	7031-043	"350 CFM"	No associated hazard.
10.	1	7031-082	"Danger" Pressurized vessel Handway components.	Propelled objects will cause serious injury or death. Incorrect or damaged handway or manway cover components can result in failure. See Section 6.3.
11a.	1	7034-001	Welded "Warning" plate General hazard and advisory notes.	Before June 2017. Steel "Warning" plate welded to pressure vessel which is a general list of required actions to take before and during the operation of this equipment. See Section 1.0.
11b.	1	7031-084	"Warning Safety Precautions"	After June 2017. General list of required actions to take before and during the operation of this equipment. See Section 1.0.

1) 7031-001

2) 7031-020

3) 7031-054

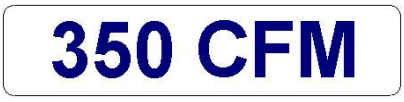
4) 7031-007B

5) 7031-017

6) 7031-008

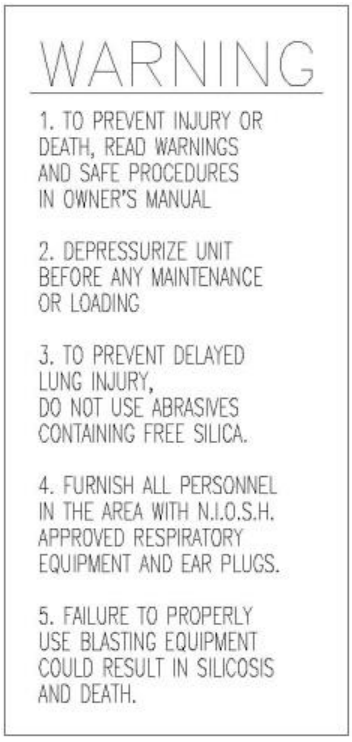
7) 7031-057

8) 7031-077

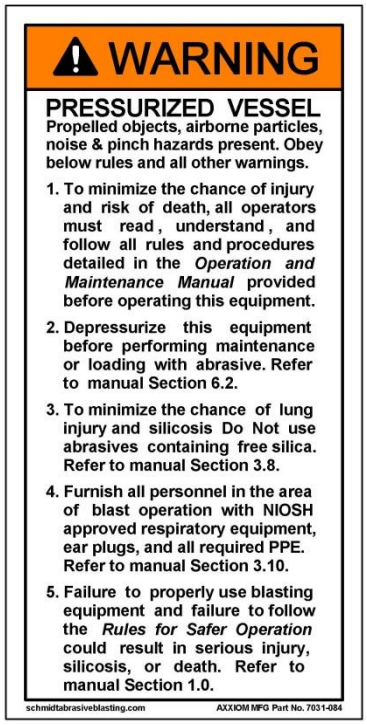


9) 7031-043

10) 7031-082



11a) 7034-001



11b) 7031-084

Note: Units before June 2017 the Warning Plate was a metal plate welded to vessel and painted. After June 2017 Units come with a Warning Decal.

Figure 0.1 – Warning decal Summary

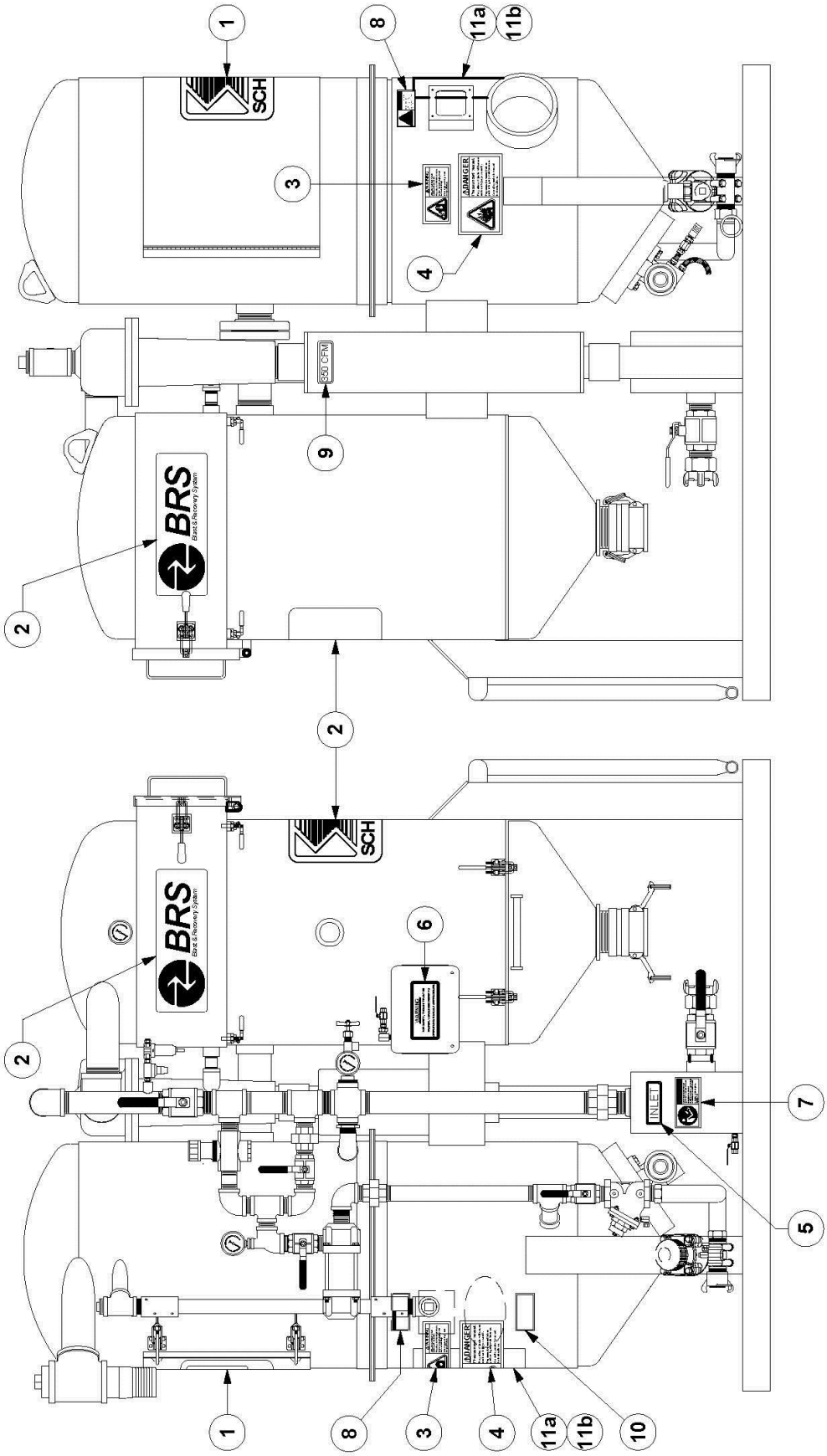


Figure 0.2 – Warning decal location

Table of Contents

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. All operators and personnel in the vicinity must wear OSHA approved foot protection during the operation of this equipment. 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. All operators and personnel in the vicinity must wear OSHA approved safety glasses during the operation of this equipment. 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. All operators and personnel in the vicinity must wear OSHA approved respiratory protection during the operation of this equipment. 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. Use extreme caution 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.

⚠ WARNING

Loud noise is produced by the blast nozzle and the blowdown operation of this equipment. All operators and personnel in the vicinity must wear OSHA approved hearing protection during the operation of this equipment. 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 may 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 protect against 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 minimize the chance of 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 1.32 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 Sections 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 may void the ASME/NB integrity.

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. INSPECT HANDWAY ASSEMBLY.

Do Not operate the abrasive blaster without first inspecting the handway assembly. To insure proper operation all handway components must be the correct size for the vessel handway opening. See Section 6.3.

1.32. 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. Do Not install a muffler or silencer on the blowdown that is not designed for use on abrasive blast equipment it can cause a malfunction and can result in a hazardous condition.

1.33. 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.

⚠ DANGER

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.

1.34. 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).

1.35. 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.

1.36. CHECK FOR DAMAGED PARTS.

Do Not use this equipment with damaged components. Periodically check all valves, hoses, fittings, pipe and pipe fittings (internal and external) to confirm that they are in good condition. Repair or replace any component that shows any sign of wear, leakage, or any other damage. See Section 8.0.

⚠ DANGER

Damaged components can fail during operation and result in serious injury or death to operating personnel.

1.37. 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 protect against accidental disconnections. Accidental hose disconnection can cause serious injury or death. See Sections 5.17 and 8.6.

1.38. 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's operating pressure. Improper hoses and/or fittings used on, or connected to the 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.

⚠ WARNING

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.

1.39. 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.

⚠ DANGER

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 reservoirs and moisture separator tanks must be ASME coded tanks.

1.40. NEVER AIM BLAST NOZZLE TOWARDS ANY PERSON.

Do Not aim the blast nozzle towards yourself or any person. A system malfunction or a blocked blast nozzle that clears can trigger accidental start up resulting in injury to personnel.

1.41. NEVER USE ABRASIVE NOT INTENDED FOR BLAST EQUIPMENT.

Do Not use abrasive blast media 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 Sections 3.8, 3.10, and reference OSHA 29 CFR 1910.134.

1.42. 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.

1.43. 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. Refer to Section 8.0 for maintenance and inspection details.

1.44. DO NOT OVERLOAD THE LIFT EYES.

Do Not load the lifting eyes above the rated capacity. Do Not lift the blast vessel by any point other than the lifting eyes or designated lift points. Do Not lift the blast vessel while it is pressurized. See Section 2.6.

1.45. DO NOT TRANSPORT BLAST EQUIPMENT LOADED WITH ABRASIVE.

Do Not attempt to roll portable blasters with abrasive inside. The additional weight of the abrasive can cause loss of control of the blaster while moving which can result in injury to operating personnel.

1.46. 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 Sections 0.0 and 8.11.

1.47. 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.

1.48. 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. Slings or other lifting devices must only be attached to the designated lifting points. See the lifting diagrams shown in Section 2.6.

2.1.5. For further information on options and accessories available for Schmidt® abrasive blasters visit the Axxiom website or contact us:

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

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

2.2 BRS Abrasive Blaster Operational Specifications

Maximum Working Pressure	125 or 150 psig @ 250°F (see ASME nameplate) All abrasive blasters manufactured after February 2005 are rated for 150 psig standard.			
Maximum External Pressure	Not designed for external pressure			
Minimum Metal Temperature	-20°F @ 125 or 150 psig (see ASME nameplate)			
Air Consumption	See Section 13.0 table 1			
Abrasive Consumption	See Section 13.0 table 2			
Blast Hose Size	See Section 13.0 table 3			
Electrical requirements	See Section 3.7			
Abrasive Capacity	Blast vessel:	2.0cu ft	3.5cu ft	6.5 cu ft
	Reclaim hopper:	6.5 cu ft		
	Airwash hopper:	2.0cu ft	3.5cu ft	6.5 cu ft
Vacuum System	Pneumatic Vacuum Pump (Eductor) 350 ICFM at approx. 100 psig			

2.3 Important Reference Numbers

Fill in the Abrasive Blaster model number, serial number, and other information in the blank spaces below. This information will be needed for reference when service, maintenance, or technical support 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.

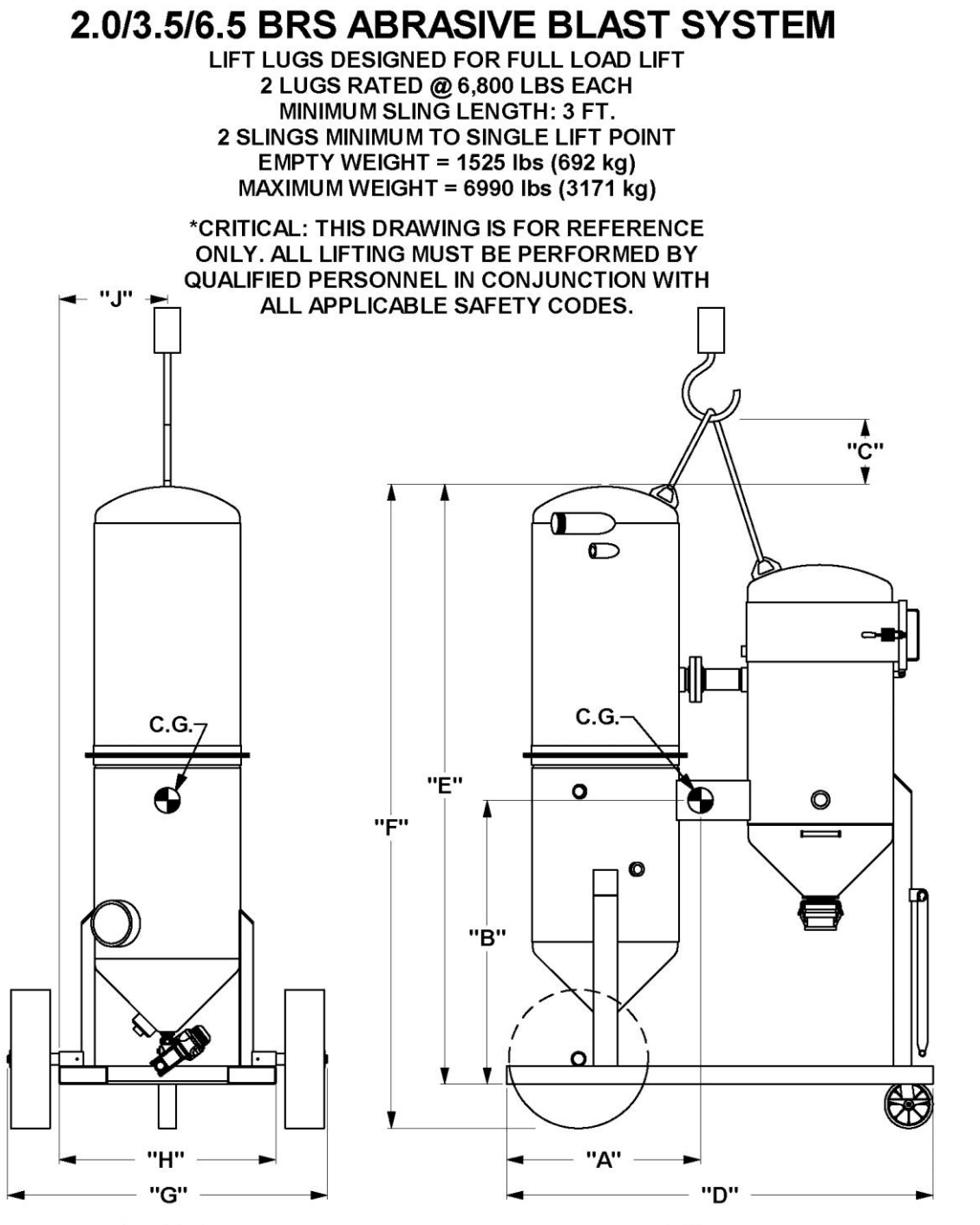
2.4.2. In order to maintain the high level of quality and quality control used in the manufacture of this vessel, it is required that any and all welded repairs to this vessel be performed by a reputable shop holding a National Board "R" Stamp and/or an ASME "U" stamp, depending on state or city law.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

2.5 Notes

2.6 BRS Abrasive Blaster Lifting Diagram

⚠ DANGER

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 and empty of abrasive before lifting, moving, or transporting.



SIZE	CONTROLS	A	B	C	D	E	F	G	H	J		*WEIGHT	
2.0	Thompson ® Valve w/ Cyclone	24"	44"	21"	60"	83"	87"	35"	27"	13.5"	in.	1390	lbs.
		(610)	(1118)	(533)	(1524)	(2108)	(2210)	(889)	(686)	(343)	(mm)	(631)	(kg)
3.5	Thompson ® Valve w/ Cyclone	29"	45"	21"	71"	90"	98"	54"	36"	18"	in.	1600	lbs.
		(737)	(1143)	(533)	(1803)	(2286)	(2489)	(1372)	(914)	(457)	(mm)	(726)	(kg)
6.5	Thompson ® Valve w/ Cyclone	28"	54"	15"	71"	111"	119"	54"	36"	18"	in.	1660	lbs.
		(711)	(1372)	(381)	(1803)	(2819)	(3023)	(1372)	(914)	(457)	(mm)	(753)	(kg)

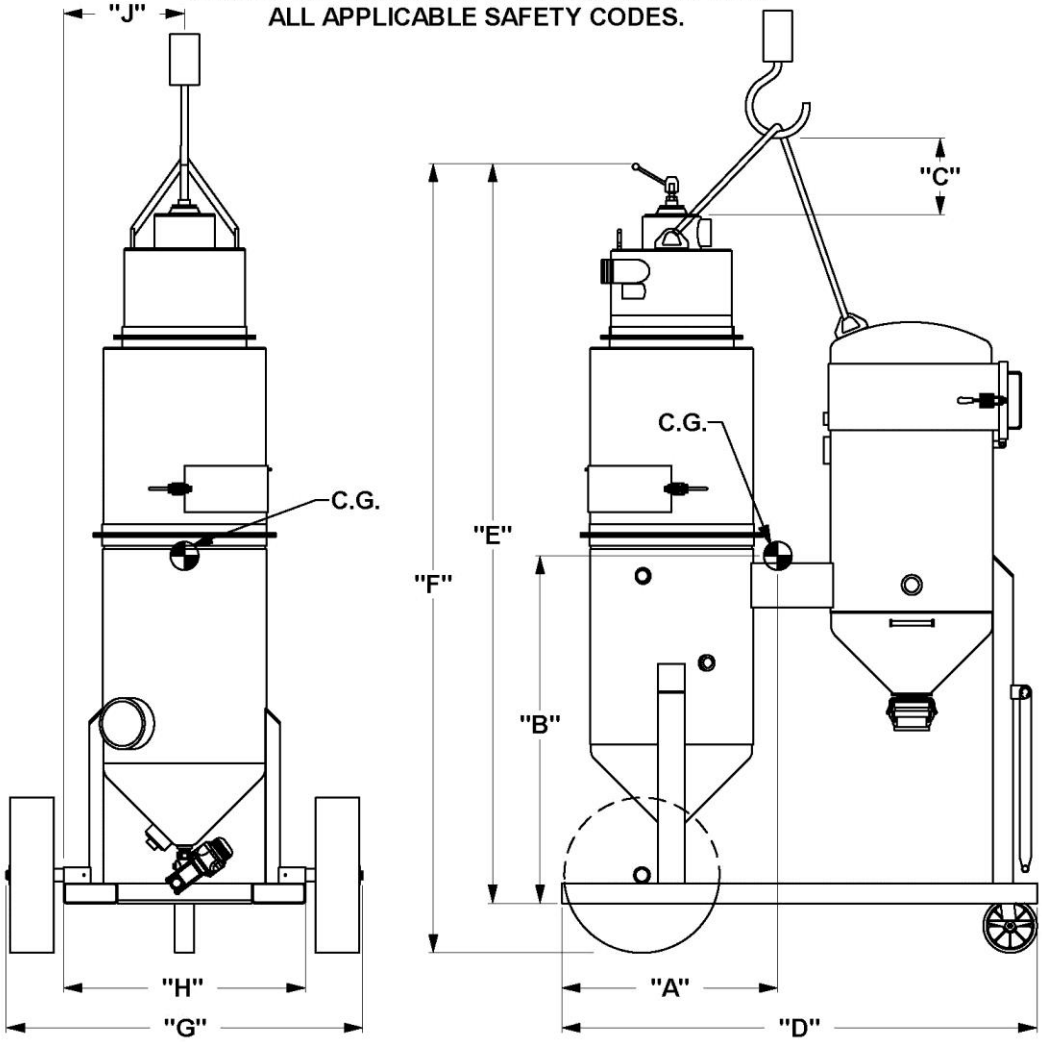
*All weights are approximate and include piping.

Figure 2.6 (a) – BRS 2.0 cf, 3.5 cf and 6.5 cf system with cyclone

2.0/3.5/6.5 BRS WITH AIR WASH

LIFT LUGS DESIGNED FOR FULL LOAD LIFT
2 LUGS RATED @ 6,800 LBS EACH
MINIMUM SLING LENGTH: 3 FT.
3 SLINGS MINIMUM TO SINGLE LIFT POINT
((2) 3FT SLINGS AND (1) 4FT SLING REQUIRED)
EMPTY WEIGHT = 1660 lbs (753 kg)
MAXIMUM WEIGHT = 7225 lbs (3277 kg)

*CRITICAL: THIS DRAWING IS FOR REFERENCE ONLY. ALL LIFTING MUST BE PERFORMED BY QUALIFIED PERSONNEL IN CONJUNCTION WITH ALL APPLICABLE SAFETY CODES.



SIDE VIEW FRONT VIEW

SIZE	CONTROLS	A	B	C	D	E	F	G	H	J		*WEIGHT	
2.0	Thompson ® Valve w/ Airwash	24"	44"	21"	60"	83"	87"	35"	27"	13.5"	in.	1390	lbs.
		(610)	(1118)	(533)	(1524)	(2108)	(2210)	(889)	(686)	(343)	(mm)	(631)	(kg)
3.5	Thompson ® Valve w/Airwash	29"	45"	21"	71"	90"	98"	54"	36"	18"	in.	1600	lbs.
		(737)	(1143)	(533)	(1803)	(2286)	(2489)	(1372)	(914)	(457)	(mm)	(726)	(kg)
6.5	Thompson ® Valve w/ Airwash	28"	54"	15"	71"	111"	119"	54"	36"	18"	in.	1660	lbs.
		(711)	(1372)	(381)	(1803)	(2819)	(3023)	(1372)	(914)	(457)	(mm)	(753)	(kg)

*All weights are approximate and include piping.

Figure 2.6 (b) – BRS 2.0 cf, 3.5 cf and 6.5 cf system with airwash

2.7 Abrasive Blaster Strapping / Packing Detail

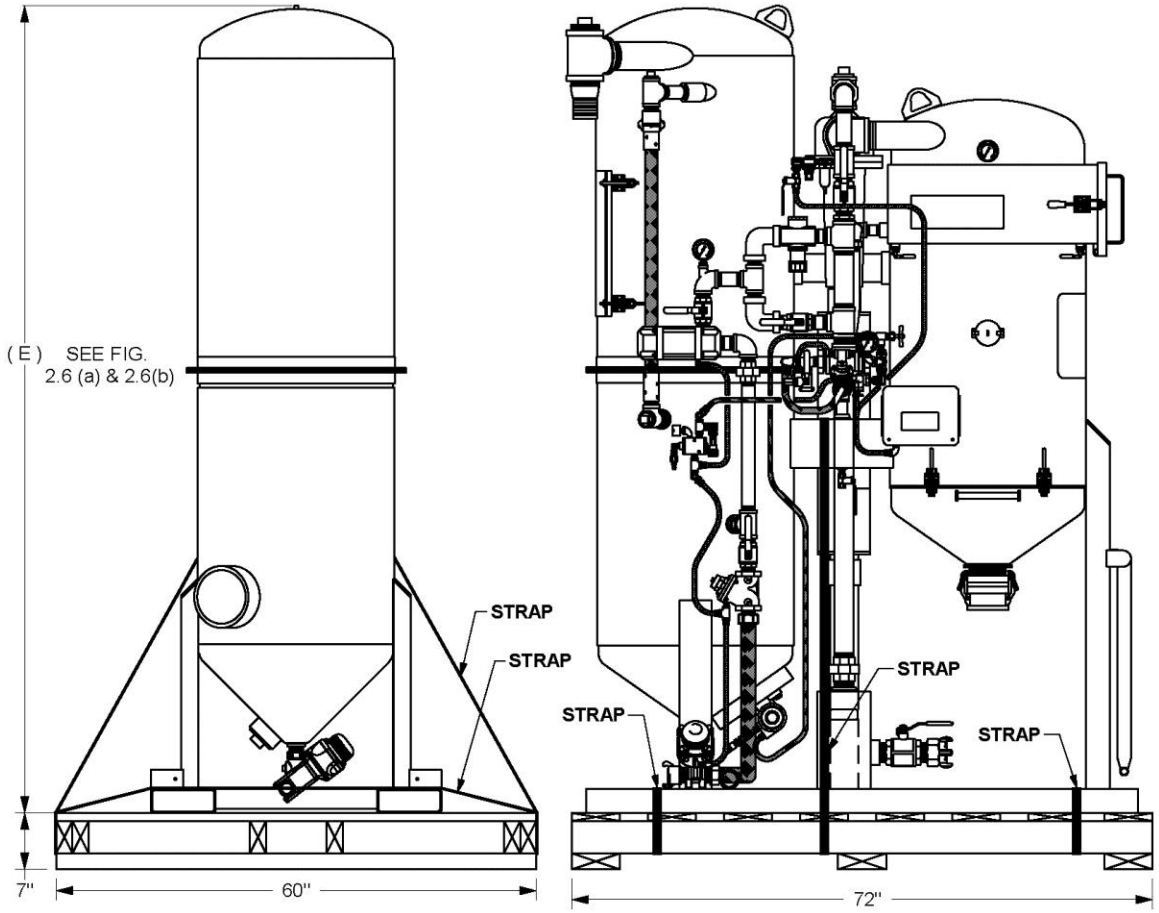


Figure 2.7 – BRS 2.0 cf, 3.5 cf and 6.5 cf Shipping Detail

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

i. *Portable units:* Units equipped with handles and wheels are portable and can be rolled to locations where blast jobs are performed. Locate the unit to allow accessibility to the handway and for ease of abrasive filling. Pay close attention to objects that may be in the path of the pressure vessel exhaust air (depressurization). See Section 5.7 for system depressurization.

ii. *Stationary units*: Units that will be installed in permanent locations require careful consideration. Install stationary blast systems in a position that will allow access to the handway and the blaster piping. These areas must be accessible to perform required maintenance. Pay close attention to objects that may be in the path of the pressure vessel exhaust air (depressurization). See Section 5.7 for system depressurization.

3.2 Compressed Air Requirements (blast nozzle)

The blast nozzle size and blast pressure determine 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.

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 air requirement dictated by the pneumatic vacuum pump nozzle size (Supplied with 350 CFM nozzle). NOTE: Optional nozzle sizes are available.

iii. 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 Section 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 protect against back flow of air pressure that can carry abrasive into the blast controls.

Hard piping connected to the abrasive blaster must be structurally supported so not to apply any loading on the pressure vessel at the points of connection. Unsupported piping can create bending loads at the pressure vessel connections which can cause damage and possible failure. Hard piping connections to the pressure vessel must be designed and installed by qualified personnel experienced with piping systems and the applicable codes pertaining to them.

⚠ CAUTION

External loading at piping connection can cause damage and possible failure of the pressure vessel. Hard piping connected to the pressure vessel must include supports to eliminate the possibility of applying loads on the pressure vessel.

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 protect against 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**: **Any air pressure regulator added to the system must have sufficient air flow capacity 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. Select a valve that will operate with little or no pressure drop (5 psi max.) at the required cfm air flow.**

The BRS 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 Figures 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 which can cause erratic flow to the abrasive valve. BRS Abrasive Blasters are equipped with an air inlet moisture separator to remove debris and condensed moisture from the incoming air flow. To minimize the chance of abrasive flow problems even further an additional moisture removal device installed for the blast system air supply is highly 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

On units equipped with electric blast controls the supply voltage is 12Vdc or 24Vac. The maximum power required is:

1-outlet: 7 watts 1-outlet with abrasive cutoff: 14 watts
2-outlet: 14 watts 2-outlet with abrasive cutoff: 28 watts

Note: Insufficient electric power output will result in malfunctioning of the electric blast control system. A power transformer or power supply can be used if the above voltages are not readily available.

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 and coating requirements, characteristics of object to be blasted, cost and 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.

Schmidt® 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.

⚠ DANGER

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).

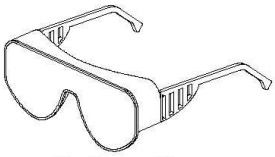
Many sources of breathing air are available such as air cylinders, free-air pumps, oil-less air compressors, and oil lubricated air compressors. The most commonly used is the same air compressor that is used for the blast air which most often is oil lubricated. Breathing air provided by an oil-lubricated 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.

⚠ DANGER

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)

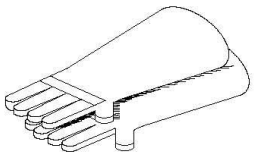
Abrasive blasting has many hazards that may cause injuries to operators. To protect operators from injury each must be supplied with, and required to use Personal Protective Equipment. The Occupational Health and Safety Administration (OSHA) requires the employer to assess the workplace to determine 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 3.10 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.



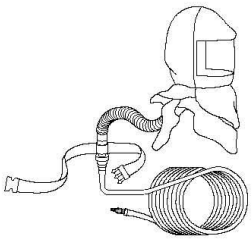
Safety Glasses
Reference OSHA 29 CFR 1910.133
Must meet ANSI Z87.1 - 1989

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

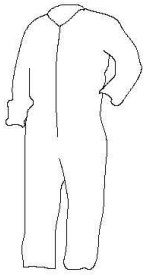
Ear Plugs
Reference OSHA 29 CFR 1926.101
Must meet ANSI S3.19
(Also see OSHA 29 CFR 1910.95)



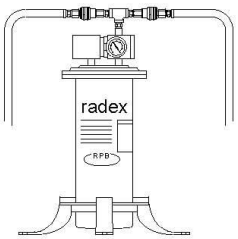
Gloves
Reference OSHA 29 CFR 1910.138
No Applicable ANSI Standard



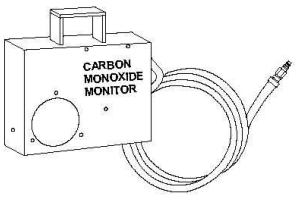
Respirator
Reference OSHA 29 CFR 1910.134
Must be NIOSH approved



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 3.10 - 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.

If the compressed air system does not provide for the installation of a pressure relief valve one can be installed on the pressure vessel piping. Refer to Figure 3.11 for the recommended location of the air pressure relief valve.

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/CE vessel nameplates attached to the pressure vessel.

⚠ DANGER

Rupture Hazard. Operating the pressure vessel above the maximum allowable working pressure can result in rupturing the pressure vessel. Install an air pressure relief valve to protect against over pressurization of the blast vessel.

⚠ WARNING

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

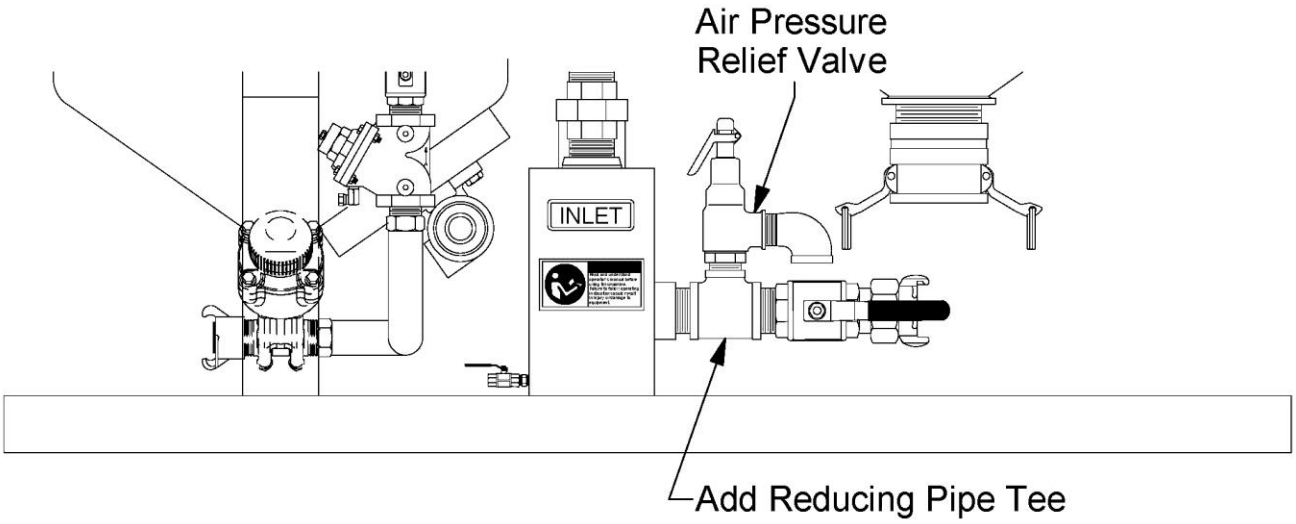


Figure 3.11 – Suggested location for air pressure relief valve

3.12 INSTALLATION CHECKLIST (Photocopy this page to use as a worksheet)

☐ ***Deadman/Twinline (or cords):*** confirm delivery with the abrasive blaster.

☐ ***Blast accessories:*** confirm receipt as purchased with the blaster.

☐ ***Inspect blaster:*** check for possible damage during shipment. See Section 8.0 for inspection instructions.

☐ ***Popup alignment:*** remove popup dust cover from top head and check popup alignment. Shifting of popup is possible during shipment. See Section 8.4 for inspection & alignment instructions.

☐ ***Clean blaster:*** remove handway cover and check for debris inside. Trapped debris can vibrate loose during shipment and later block abrasive flow. If necessary vacuum the bottom of tank. Replace handway cover per instructions in Section 6.3.

☐ ***Accessible location:*** install stationary blasters so that handway is accessible for maintenance. See Section 3.1 for additional information.

☐ ***CFM available:*** determine available air supply (cfm) and record here._____
See Sections 3.2, 3.3, and 3.5 for information on determining air requirements.

☐ ***Air supply connection:*** install air supply piping or connect an air supply hose that is the same size as the blaster piping size or larger. See Section 3.4 for details.

☐ ***Air quality:*** install moisture separator or AirPrep System to remove moisture from blast air supply to protect against abrasive flow problems. See Section 3.6.

☐ ***Electric power:*** provide power source for electric deadman controls. See Section 3.7.

☐ ***Blast abrasive:*** select abrasive suited for application. See Section 3.8.

☐ ***Breathing air:*** provide Grade D air source for blast operators. See Section 3.9.

☐ ***PPE:*** provide all the necessary personal protective equipment. See Section 3.10.

☐ ***Pressure relief valve:*** install relief valve if not provided on air compressor. See Section 3.11 for information on pressure relief valve installation.

☐ ***Blast nozzle:*** select size based on available cfm noted above. See Section 5.15.

☐ ***Blast hose:*** select size three times the nozzle size to be used. See Section 5.14.

☐ ***Adjust media spider:*** adjust height per drawing in Section 9.13 (spider is optional).

☐ ***Operator training:*** all operators must completely read and understand the operation and maintenance manual and be properly trained in equipment and blast operations.

☐ ***Abrasive Blaster Setup:*** follow procedures in Section 6.0.

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 BRS 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 BRS through a top vacuum port. All the compressed air must be removed from inside the abrasive blaster before it can be filled with abrasive. The abrasive can be loaded by the BRS vacuum systems pneumatically. To begin blasting, the abrasive inlet 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 metering 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. From the metering valve 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.

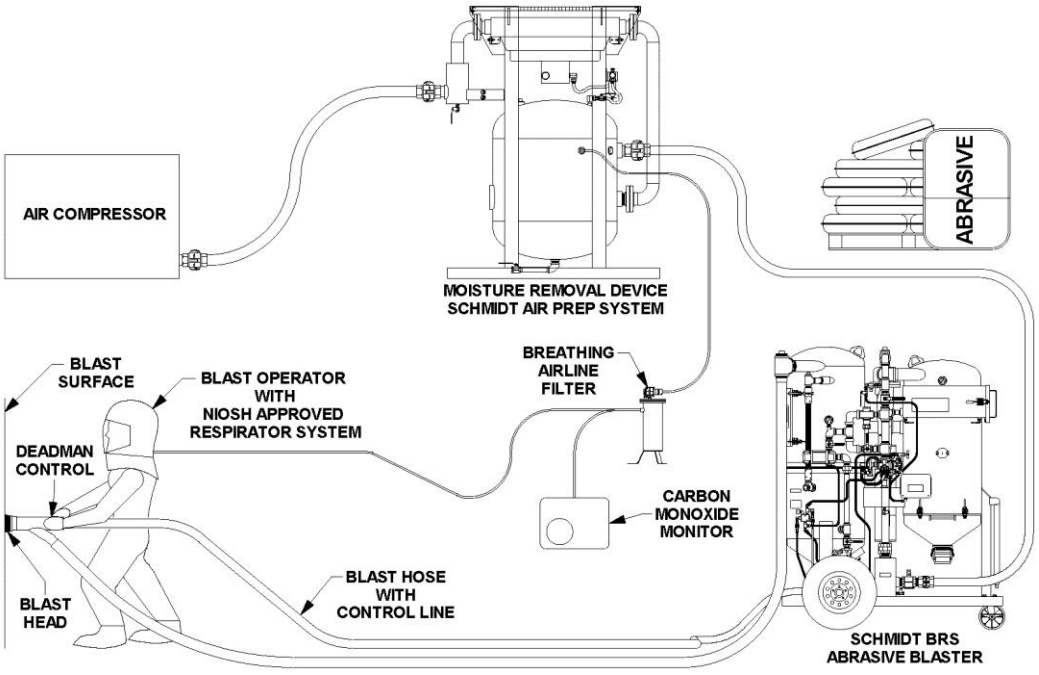


Figure 4.1 – Typical BRS Abrasive Blast System

5.0 BRS Abrasive Blast System General Operation

See Figure 5.1 or Figure 9.1(a) (page 64) to help understand the general operation of the BRS abrasive blaster. Do not attempt to operate the abrasive blaster before reading all sections of this manual and following all setup procedures. Read Sections 5.1 through 5.23 and Section 6.0 for a detailed explanation of all components of the BRS abrasive blaster.

The function of the BRS unit is to blast and recover abrasive media. The BRS is designed to blast and vacuum abrasive independently, or blast and vacuum simultaneously. The abrasive is contained in the pressure vessel (#23) for blasting. After or during the blast operation the abrasive is recovered in the reclaim hopper using a vacuum system. Small particles are carried by the vacuum air stream through the reclaimer (#21) into the dust collector (#26). The reusable abrasive drops to the bottom of the reclaim hopper. Large particles (paint chips, cigarette butts, etc.) are trapped by the abrasive screen (#22). When the pressure 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 (#26). The dust collector filters the vacuum air and traps the waste dust for disposal.

The BRS abrasive blaster is a depressurized system; meaning the blaster will pressurize only when the Combo Valve® (#5) is opened by pressing the deadman lever (#13).

Compressed air enters the blast system when the air inlet ball valve (#1) is opened. Compressed air enters the inlet moisture separator (#2) which filters trash and condensed moisture from the incoming air. The moisture collected is drained from the bottom of the moisture separators through the drain valves (#3). The compressed air then flows into the blast piping and the supply side of the Combo Valve (#5). When the deadman lever (#13) is pressed down, signal air will flow back to open the Combo Valve and the automatic air valve (#58). When the Combo Valve opens air will flow into the pressure vessel internal piping. The air flow pushes the popup (#24) against the gasket (#25) to seal the abrasive inlet and allow the air flow to pressurize the pressure vessel (#23). See Figure 5.2.

Blasting starts when the deadman lever (#13) is pressed down opening the combo valve (#5) and the automatic air valve (#58). Compressed air will flow from the blaster piping to the blast hose (#54) and out through the blast nozzle (#51). The choke ball valve (#11) must be open during the blast operation. Abrasive will flow through the Thompson Valve® (#12) 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 (#12). 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 (#13) is released. This will close the automatic air valve (#58), Combo Valve (#5), Thompson Valve (#12), and depressurize the vessel at the same time. The compressed air in the pressure vessel will exhaust through the blowdown hose (#6) into the reclaimer (#21).

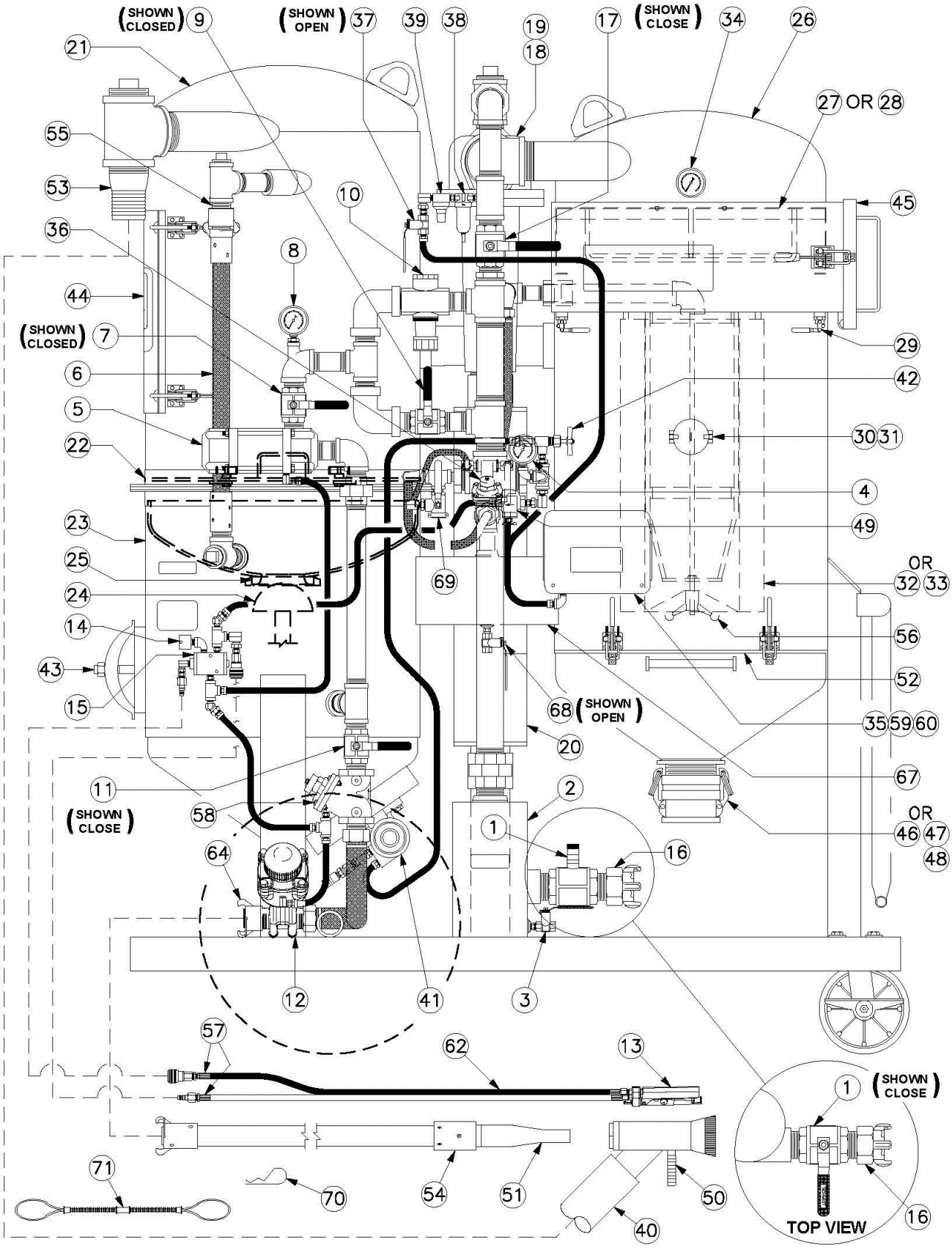


Figure 5.1 – BRS Abrasive Blaster

5.1 Popup Valve (abrasive inlet)

The blaster is filled with abrasive through the abrasive inlet at the top of the pressure vessel (#23). The abrasive inlet is automatically sealed by the popup head (#24) when the blaster is pressurized. The air flow into the internal piping pushes the popup (#24) up against the gasket (#25). 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.

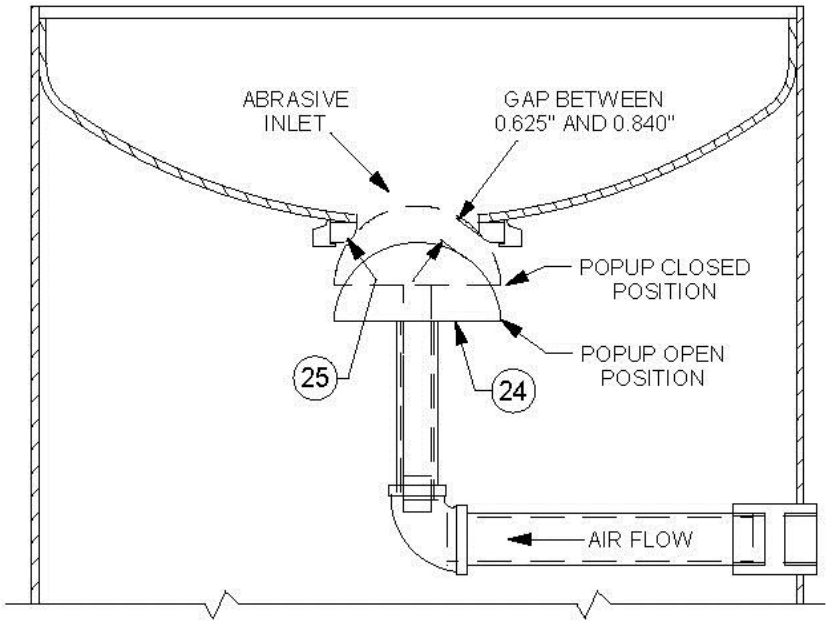


Figure 5.2 – Standard Popup Assembly

5.2 Air Supply Connection

Air is supplied to the abrasive blaster through a hose connection at the air inlet crowfoot (#16). 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 inlet moisture separator (#2) and into the Combo Valve® (#5). In the BRS depressurized system the blast vessel *does not* pressurize when the inlet ball valve is opened.

5.4 Inlet Moisture Separator

Air flow into the BRS Blast System passes through the inlet 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. After each use the drain ball valve should be completely opened to drain all the moisture that has accumulated. The drain ball valve (#3) should be left closed anytime the unit is not in use.

5.5 Regulated Tank/Blast Pressure Control

The BRS Blast System is equipped with an air pressure regulator (#10). 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 (#8). The bypass ball valve (#9) must be closed to use the regulated air pressure piping. **Note:** The air pressure regulator (#10) 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 protects against air flowing backwards from the pressure 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 airline. This allows blasting at full pressure for tougher applications without changing the setting of the air pressure regulator (#10). Open ball valve (#9) to bypass the pressure regulator and allow blasting at full air pressure. Then close the ball valve (#9) to resume using the regulated pressure control.

5.7 Combo Valve® (blast vessel pressurization/blowdown)

The Combo Valve (#5) 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 (#6) 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 pressure vessel (#23) and through the blast air piping to the blast nozzle.

The Combo Valve opens and blasting starts when the deadman lever (#13) is pressed down. The pressure vessel will pressurize.

The Combo Valve closes and blasting stops when the deadman lever (#13) is released. The pressure vessel will depressurize (blowdown).

When the Combo Valve closes the pinch ram on the blowdown hose (#6) is released and the air inside the pressure vessel (#23) will exhaust through the blowdown hose. The pressure vessel (#23) remains depressurized when the Combo Valve (#5) is closed. The abrasive blaster must be depressurized before filling with abrasive or before performing any maintenance. (See section 6.2)

Note: The combo valve blowdown hose (#6) is connected to the reclaimer (#21) therefore; the blast vessel exhaust air will vent into the reclaimer.

⚠ DANGER

The BRS 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.

⚠ 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 (#6) from the reclaimer (#21).

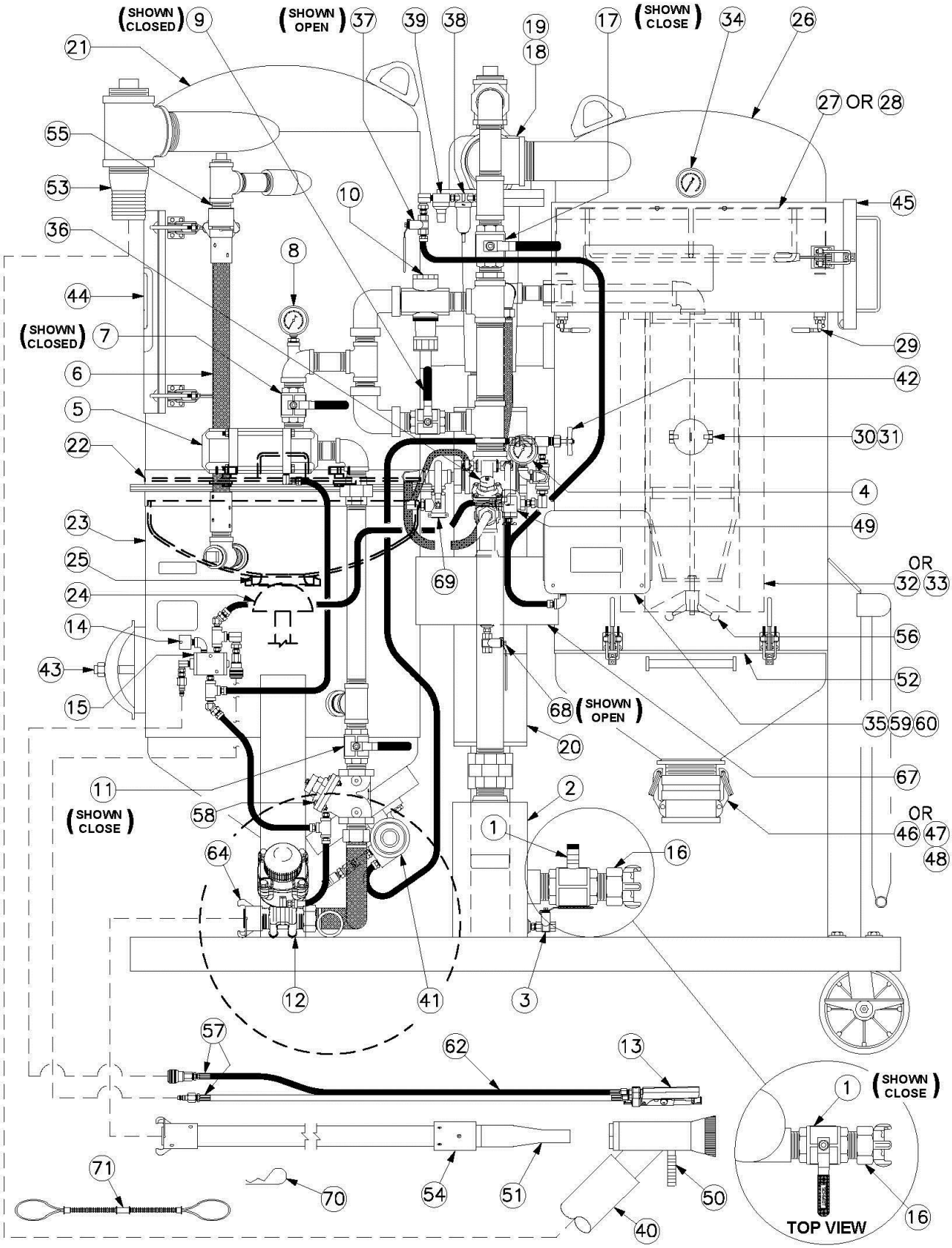


Figure 5.3 – Typical BRS Abrasive Blaster

5.8 Choke Valve

The choke valve (#11) is used to clear any trash that may get into the blast vessel and block the Thompson® Valve orifice. Whenever trash (paint chips, cigarette butts, etc.) blocks the Thompson Valve orifice the procedure is to fully open the Thompson Valve by backing out the knob, then press down the deadman lever (#13) 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 force the trash through the Thompson Valve orifice. Keep the choke valve fully open at all other times while blasting to minimize excess Thompson Valve wear. **Note:** If the BRS abrasive blaster is equipped with the abrasive cutoff feature set the cutoff valve (or switch) to the on-position for the choke procedure. See Sections 5.12 and 9.4.

⚠ WARNING

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 (blast air valve)

The automatic air valve (#58) is a normally closed valve that opens to supply blast air to the blast hose (#54) and blast nozzle (#51). The automatic air valve opens when it receives air to its signal port. This happens when the deadman lever (#13) 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 9.8.

5.10 Thompson® Valve II (abrasive metering valve)

The Thompson Valve (#12) 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 Sections 9.7). This happens when the deadman lever (#13) 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 (#54) and nozzle (#51).

The Thompson Valve also controls (meters) abrasive flow by use of 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 Sections 9.7). Turning the knob clockwise reduces the orifice size which decreases abrasive flow. Turning the knob counter-clockwise increases the orifice size which will increase the abrasive flow to the blast nozzle. The Thompson Valve II spring retainer has lines on the side to use as reference as to the amount 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. See Section 9.7.

The Thompson Valve II has a cleanout port where a ball valve can be installed and used to purge trash that blocks abrasive flow. This is done by opening the clean out valve and pressing down the deadman lever (#13). The blast air flow purges trash through the clean out valve.

⚠ WARNING

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

5.11 Union End Ball Valve (optional abrasive shutoff)

The union ball valve 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. **Note:** Units manufactured after February 2015 are equipped with the ergonomic round handle design (see Figure 5.4).
Note: Purging the abrasive from the Thompson Valve will minimize chance of seizing of the union nut allowing it to turn freely.

⚠ DANGER

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

Note: BRS system with this option have been design to accommodate the union end ball valve. This option cannot be added to an existing unit without this option been present at the time of purchased. For other options on adding a union end ball valve to an existing BRS system consult with Axxiom Manufacturing or an Authorized Schmidt® distributor.

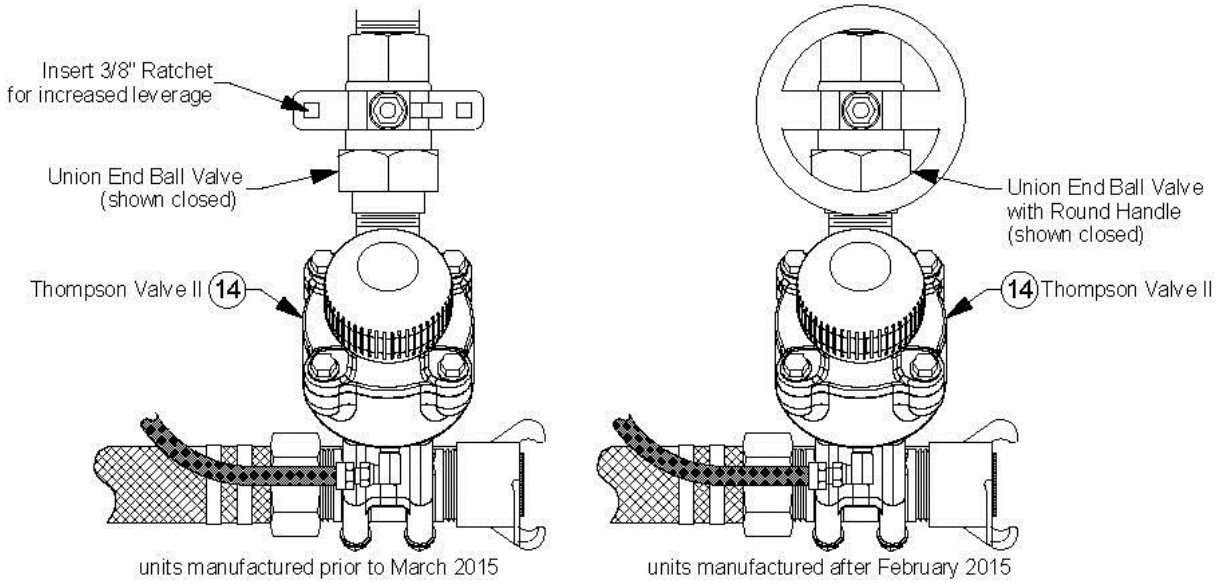


Figure 5.4 – Union End Ball Valve

5.12 Deadman Valve/Switch (blast control)

The deadman valve/switch is part of a system that controls the blast operation. The deadman valve/switch (#13) allows the operator to remotely start and stop the blast operation. The deadman is mounted at the end of the blast hose assembly (#54) close to the blast nozzle (#51) 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® (#5), automatic air valve (#58) and the Thompson® Valve (#12). See Sections 9.1, 9.2, and 9.11.

5.12.1. ***Pneumatic Deadman System:*** When the pneumatic deadman lever is pressed down, air supply from the orange hose of the twinline hose (#62) 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® (#5), auto air valve (#58) and the Thompson Valve (#12). When the deadman lever is released the air signal is cut off and the remaining air vents from the breather (#14). See Figure 5.5 and the drawing in Section 9.1 and 9.2.

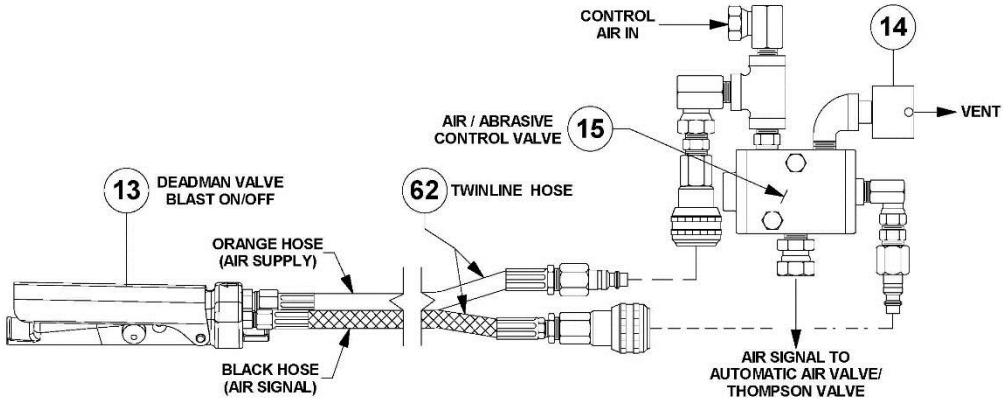


Figure 5.5 – Thompson Valve Pneumatic Blast Control System

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 Combo Valve® (#5), auto air valve (#58) and the Thompson® Valve (#12). When the deadman lever is released the electric circuit is cut off closing the control valve. The signal air vents from the breather (#14). See Figure 5.6 and the drawing in Section 9.1 and 9.2.

⚠ CAUTION

Electric shock hazard. Abrasive blasters with electric deadman blast control systems must operate on low voltage supply (12-24 volts). To minimize shock hazard only use low voltage sources and use caution when connecting the power to the abrasive blaster. See Section 3.7.

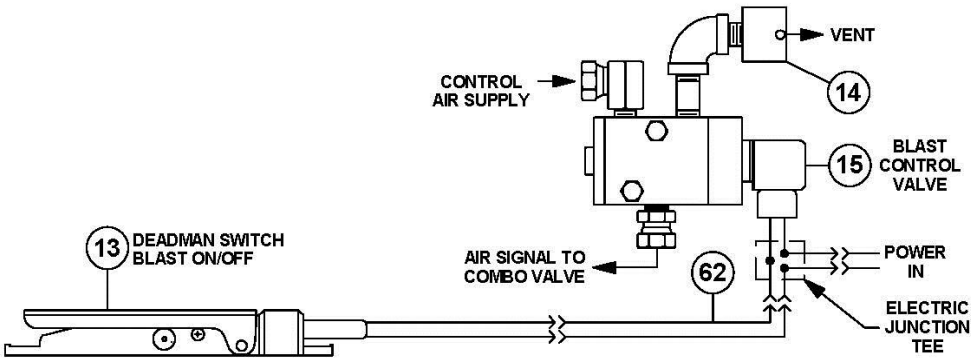


Figure 5.6 – Thompson Valve Electric Blast Control System

5.13 Abrasive Cutoff (optional)

An optional feature of a BRS blaster is an abrasive cutoff. There are two uses for the abrasive cutoff feature. First is to allow blasting air without abrasive. This is useful for blowing off abrasive from the item blasted. To blast with air only, set the abrasive cutoff valve (or switch) to the "off" position, then press down the deadman lever (#13). This will send a control signal to the Combo Valve® and the automatic air valve only; therefore, only blast air will exit the blast nozzle (#51). For the abrasive cutoff 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. See Sections 9.4(a) and 9.4(b).

The second use for the abrasive cutoff is to purge abrasive out of a long blast hose. This prevents abrasive from collecting in the blast hose when the blast operation is stopped. The abrasive at rest in the blast hose can cause surges when restarting the blast operation.

Note: The abrasive cutoff feature is optional; however, factory conversion kits are available to upgrade BRS blasters to include this feature. Consult Axxiom Manufacturing or an Authorized Schmidt® distributor.

5.14 Blast Hose

The blast air and abrasive mixture flows from the Thompson® Valve (#12) to the blast nozzle (#51) through the blast hose assembly (#54). The typical length of the blast hose is 50ft; however blast hose extensions can be added to increase length. 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 approximately 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 minimize the chance of static electrical shock to operating personnel only use static dissipating blast hose and install a grounding strap on the abrasive blaster.

Static electric shock hazard. To minimize the chance of static electric shock install a grounding strap on the abrasive blaster and only use static dissipating blast hose.

Note: To reduce operator fatigue a blast whip hose can be used along with the blast hose. A whip hose is thinner wall, light weight hose. Consult an Authorized Schmidt® distributor.

5.15 Blast Nozzle

The blast nozzle (#51) is an important part of the blast operation since the size of it 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 more 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 as needed.

The nozzle size is indicated by a small number 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

5.15 Blast Nozzle (cont.)

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 (#18) capacity. This will protect against blast air and dust from blowing out around the nozzle brushes on the BRS vacuum head (#50). 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

The BRS vacuum head (#50) is an 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 (#51) screws into the nozzle holder (#54) of the blast hose assembly, which in turn fits into the BRS vacuum head (#50). Then the suction hose (#40) attaches to the side of the vacuum head. The vacuum hose to BRS vacuum 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 vacuum head is equipped with brushes and a center wear tube that attach to the working end of the head (see Figure 5.7 and Section 9.14). 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 (#51) 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.

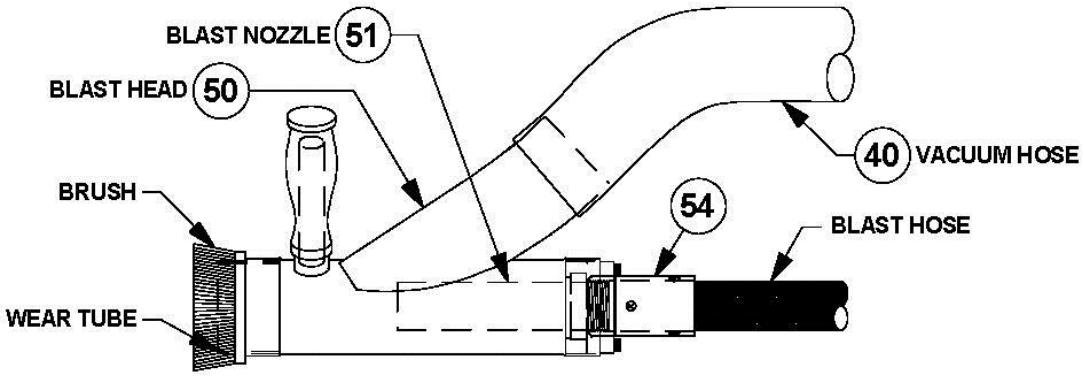


Figure 5.7 – BRS Vacuum Head Detail

5.17 Hose Connection

All air hose, blast hose, and threaded couplings have two pin holes that align when connected. To protect against 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.

⚠ WARNING

Failure to install safety pins on all air and blast hose couplings can result in hose disconnects and could result in serious injury or death.

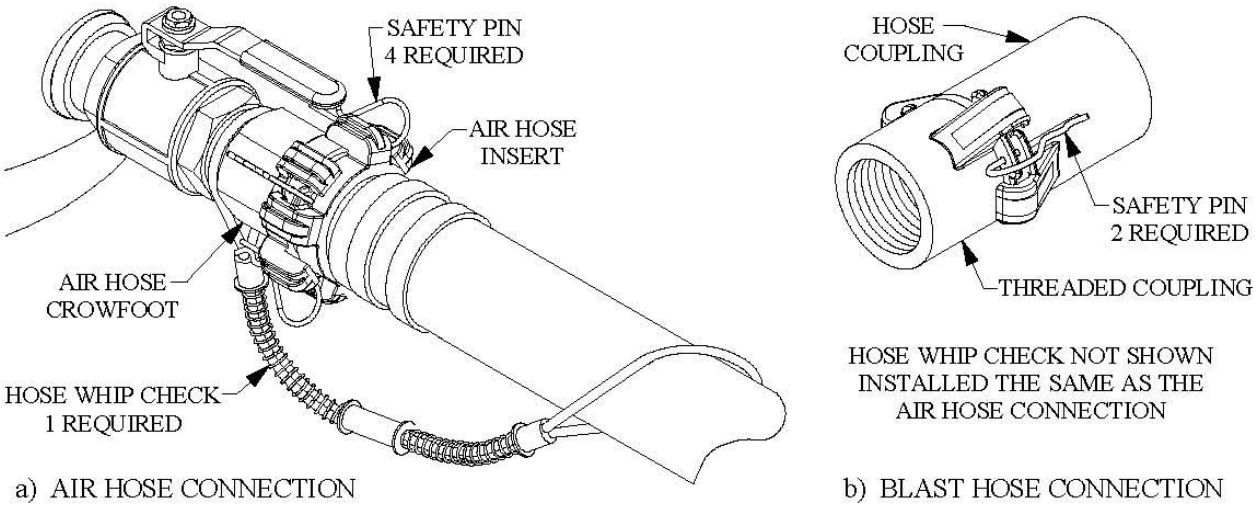


Figure 5.8 – Hose Connection Disconnect Protection

5.18 Pneumatic Vacuum Pump (Eductor)

The vacuum system is used for media recovery during closed blasting (simultaneous blasting and recovery), or when solely vacuuming media. The principal component of the vacuum system is the pneumatic vacuum pump (#18). The vacuum pump is powered by a minimum of 150 CFM of compressed air at 100 psig. To activate the vacuum system open the ball valve (#17) located in the air supply piping. The vacuum generated by the vacuum pump can be regulated by the supply ball valve (#17). When closed blasting, it may be necessary to reduce the vacuum to protect against warping of thin materials. To reduce the level of vacuum, slightly close the ball valve (#17) to obtain the desired vacuum. The vacuum pressure is indicated on the pressure gauge (#34) located on the dust collector (#26). The vacuum pump exhausts air through a muffler (#20) and into the BRS frame which further muffles the exhaust and diffuses the air velocity. For varying vacuum applications the pneumatic vacuum pump (#18) can be equipped with a 150, 225, 350, or 440 CFM nozzle (#19) (Refer to section 5.15 for procedure to determine the nozzle size).

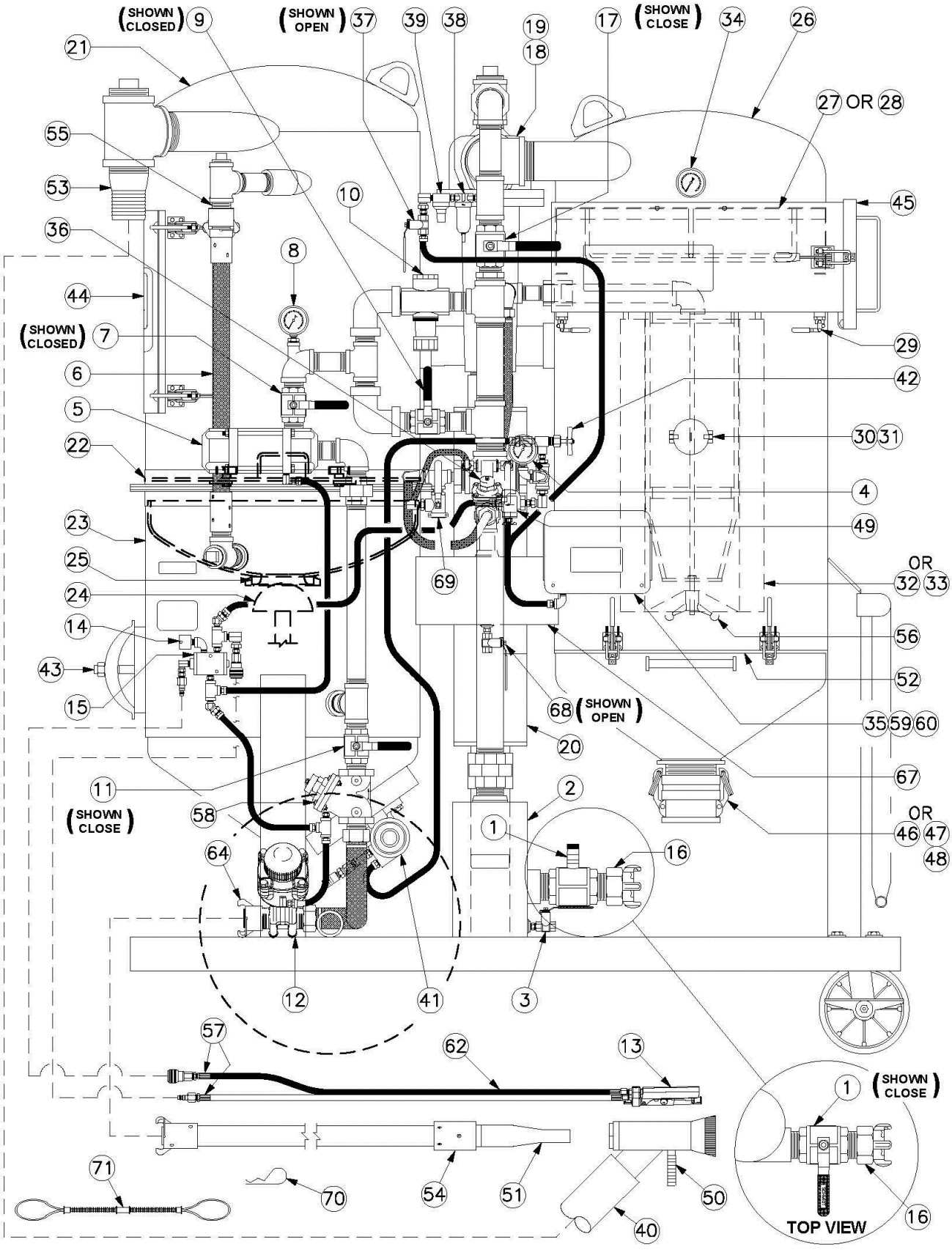


Figure 5.9 – Typical BRS Abrasive Blaster

5.19 Adjustable Air Wash Media Reclaimer (Optional)

The function of the adjustable air wash media reclaimer (#21) is to receive the media recovered by vacuuming. The adjustable air wash media reclaimer is a two stage media separator. The media and other debris enter the media reclaimer at the tangential inlet (#53) which creates a cyclonic action on the incoming flow (see Figure 5.10). Large heavier particles spiral on the outer extreme and are carried to the bottom of the media reclaimer. The primary media separation occurs at the bottom of the upper cylinder (a). The remaining debris and media falls downward through the conical orifice (b). At this point smaller particles are washed from the media by the vacuum flow into the cone tube (c) and flows into the dust collector through the reclaimer outlet (d). The vacuum intensity at the cone tube is adjusted by the urethane cone tube plug (e). The adjustment is made by rotating the air wash metering rod and plug handle (f) to raise or lower the urethane cone tube plug. Raising the urethane plug increases the air wash vacuum intensity, while lowering it decreases the intensity. This adjustment is necessary to optimize dust removal while also minimizing removal of good media. Below the media reclaimer there is a screen (#22) mounted on vibration isolators (#66) that protect against debris (paint chips, cigarette butts, etc.) from passing into the pressure vessel (#23). Located on the screen is a media vibrator (#61) to aid in media flow through the screen. The screen should be inspected and cleaned periodically. It can be accessed through the access door (#44) of the reclaimer hopper. When blasting is interrupted, the pressure vessel pop-up valve (#24) opens which allows the media accumulated in the reclaim hopper to enter the pressure vessel.

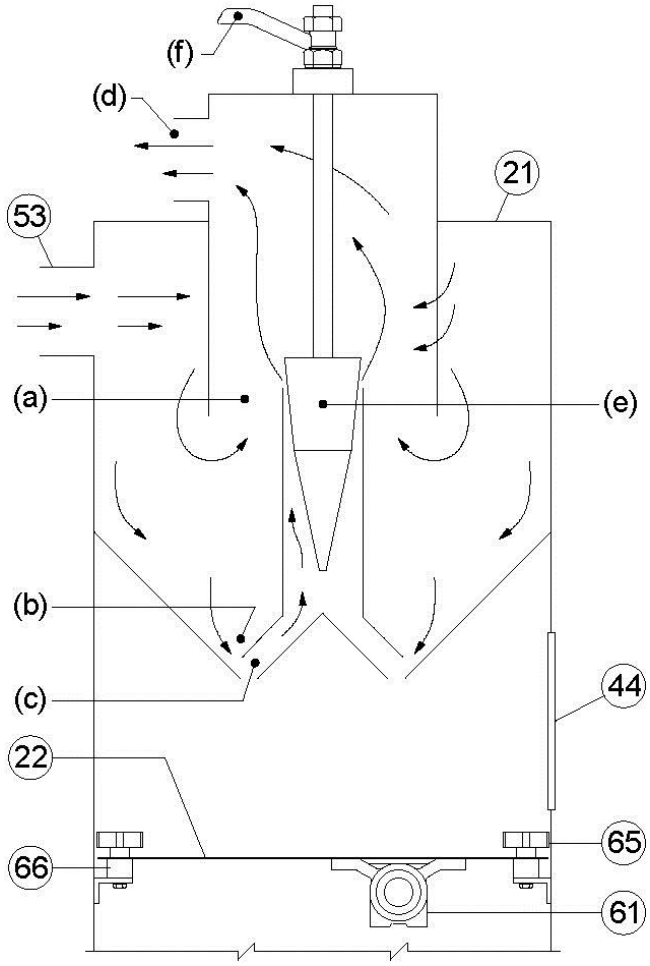


Figure 5.10 – Adjustable Air Wash Media Reclaimer

5.20 Dust Collector

The dust-filled vacuum air stream from the reclaimer (#21) enters the dust collector (#26) where the dust particles are filtered out by one of three available methods (wet filtration, dry filtration or HEPA filtration). The clean vacuum air stream is evacuated from the dust collector through the vacuum pump (#18). The dust removed from the air stream collects at the bottom of the dust collector cone. The dust can be drained by opening the cam lock 4” port by removing the dust cap (#46). Periodically open the dust cap (#46) 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. See Sections 3.8, 3.10, and OSHA 29 CFR 1910.134.

5.20.1. Wet Filtration

The first viable method of filtration by the dust collector (#26) is wet filtration. This method pulls the dust-filled air stream through water which traps the dust particles. After rising through the water, the air stream passes through a stainless steel demister filter (#27) to remove any water droplets that may have mixed with the air stream. The demister filter is a removable component that fits in the box section of the dust collector through the door (#45). After sliding the demister filter (#27) into the box section, push it into position with the four HEPA filter clamps (#29). The dust collector is filled with water through a 2" connection (#31) up to the bottom of the connection. The water in the dust collector should be changed periodically. The ideal time to do so is at the end of the work day before the dust has settled to the bottom. The water can be drained through a butterfly valve (replaces the cam lock & dust cap (#46)) at the bottom of the dust collector. The dry filter and HEPA filter (if so equipped) must be removed from the dust collector prior to operating with wet filtration.

5.20.2. Dry Filtration

The second optional method of filtration is dry filtration. This method utilizes a pleated filter that fits in the round section of the dust collector. The dry filter (#32) is installed through the door (#52) on the bottom of the dust collector. The filter is held in position by the clamp (#56) which pushes the dry filter against the bottom of the round section of the dust collector. The dry filter must be pulsed regularly during operation to protect against clogging (see Section 5.21). In addition the filter must be periodically cleaned to insure long life (see section 8.15).

5.20.3. HEPA Filtration

When particulate free exhaust air is required, the optional HEPA (High Efficiency Particulate Air) filter (#28) can be installed. The HEPA filter is tested by DOP method to be 99.97% efficient on particles 0.3 microns in size or larger. In this arrangement the air passes through the dry filter (#32), then passes through the HEPA filter before exhausting. The HEPA filter fits in the box section of the dust collector through the door (#45). After sliding the HEPA filter into the box section, push it into position with the four HEPA filter clamps (#29). This seals the filter against the bottom of the box section of the dust collector. The dry filter (#32) must be used in conjunction with the HEPA filter.

5.21 Pulse Jet System

The function of the pulse jet system is to protect against clogging of the dry filter (#32) by periodically providing a burst of air inside the filter to loosen dust particles from the pleated surface. This is accomplished manually or 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 vacuum pressure within the dust collector will increase. This increase can be detected on the pressure gauge (#34). The pulsing air supply utilizes a reservoir (#67) to protect against pressure drops at the blast nozzle. The reservoir has a ball valve (#68) located at the bottom to drain the moisture collected. During operation this ball valve (#68) should be slightly open so that the moisture collected can drain.

5.21.1. Manual Pulse

The manual pulse process is totally operator dependent and requires consistent operation to insure trouble free vacuum filtration. The manual pulse requires the operator to periodically open the ball valve (#69) for a fraction of a second which provides the burst of air to loosen entrapped particles. The pulse should be actuated regularly during closed blasting (blasting w/vacuum recovery) and may require a second operator.

5.21.2. Automatic Pulse Jet Controls

The automatic pulse system provides operator-free pulsing of the dry filter and operates only when the vacuum pump (#18) is powered. The automatic pulse jet is controlled by a pneumatic oscillator (#59) located in the pulse air control box (#35) (see Section 9.6). Upstream of the pulse air control box an air filter (#38) and a non-adjustable regulator (#39) are installed to maintain the clean air, of a maximum of 80 psig, required by the pulse controls. The pulse air control box vents the signal from the pulse valve (#36), which opens providing the burst of air necessary to unclog the dry filter (#32). The adjustment of the pulse air control box is dictated by the blasting conditions. The interval between pulses is adjusted by the upper knob (T1) on the oscillator (#59). The pulse length is adjusted by the lower knob (T2). The pulse effect can be seen by a decrease in the vacuum reading on the pressure gauge (#34). The automatic pulse jet controls can be disabled by closing the ball valve (#37). In addition, manual pulsing can be applied by opening the ball valve (#69) which vents the air signal from the pulse valve (#36). The purpose of this feature is to allow pulsing to clean the dry filter without the operation of the vacuum pump.

5.22 Abrasive Vibrator (vessel)

The function of the abrasive vibrator (#41) is to vibrate the abrasive in the pressure vessel (#23) to improve abrasive flow. The level of vibration is controlled by the angle valve (#42), which can also turn off the vibration.

5.23 Abrasive Vibrator (reclaim hopper screen, air wash only)

The reclaimer hopper is equipped with a screen mounted vibrator (#61) to increase abrasive flow through the screen. The level of vibration is controlled by the angle valve (#63), which can also turn off the vibration. The vibrator can be accessed through the access door. (See Section 9.2 and 9.5)

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 *BRS Abrasive Blaster Operation and Maintenance Manual*.

⚠ DANGER

The Abrasive Blaster is a pressurized vessel. Propelled objects will cause serious injury or death. Depressurize vessel before performing any maintenance. See Section 6.2.

6.1 BRS Abrasive Blaster Setup Procedure (see Figure 6.2)

6.1.1. Confirm that the abrasive blaster is properly maintained and inspected as detailed in Section 8.0.

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

⚠ CAUTION

Static electric shock hazard. To minimize the chance of static electric shock install a grounding strap on the abrasive blaster and only use static dissipating blast hose.

6.1.3. 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. See Section 3.11.

⚠ DANGER

Rupture Hazard. Operating the pressure vessel above the maximum allowable working pressure can result in rupturing the pressure vessel. Install an air pressure relief valve to protect against over pressurization of the blast vessel. See Section 3.11.

6.1.4. Make certain that the abrasive blaster is not pressurized. Follow the depressurizing procedure given in 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.

6.1.5. Properly install the handway cover and gasket. See Section 6.3. Check that the reclaim hopper door (#44), and the dust collector doors (#45 & #52) are closed and tightened.

6.1.6. 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.

6.1.7. Close the air inlet ball valve (#1), blast vessel vibrator valve (#42), choke ball valve (#11), and the pulse jet ball valve (#37).

6.1.8. Open the cam lock (#46) at the bottom of the dust collector (#26) to drain the collected dust. Tightly close cam lock (#46).

⚠ 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. All operators and personnel in the vicinity must wear OSHA approved respiratory protection during the operation of this equipment See Sections 3.9, 3.10, and OSHA 29 CFR 1910.134.

6.1.9. Check that the dust collector filter (#32) is in place and in good condition.

6.1.10. Hose clamp the deadman (#13) onto the blast hose assembly (#54) in a comfortable position behind the nozzle holder (#54).

6.1.11. Wire tie the twinline hose (#62) or electric deadman extension cords to the blast hose assembly (#54).

6.1.12. Remove BRS vacuum head (#50) from blast hose assembly.

6.1.13. Screw nozzle (#51) into the nozzle holder at end of the blast hose assembly (#54).

6.1.14. Connect the blast hose coupling (#54) to the threaded coupling (#64) on the abrasive metering valve (#12). Then install safety pins (#70) and a hose whip check (#71) to protect against accidental disconnections during operation. See Section 5.17 and 8.6.

⚠ WARNING

Failure to install safety pins and hose whip check on all blast hose couplings can result in hose disconnects and could result in serious injury or death. See Sections 5.17 and 8.6.

6.1.15. Connect the twinline hose quick disconnects (#57) or the electric deadman extension cord to the mating disconnects on the abrasive blaster piping.

⚠ 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.

6.1.16. Connect the vacuum hose assembly (#40) to the vacuum inlet (#53).

6.1.17. Connect a 150 psi rated (minimum) air supply hose to the air inlet crowfoot (#16) and install safety pins (#70) and a hose whip check (#71) to protect against accidental disconnections during operation. See Section 5.17 and 8.6.

⚠ WARNING

Failure to install safety pins on all blast hose couplings can result in hose disconnects and could result in serious injury or death. See Sections 5.17 and 8.6.

6.1.18. Open drain valves (#3, #68) on the air inlet moisture separator (#2) and on the pulse air reservoir (#67) to drain out any moisture that may be inside of them. **Note:** These drain valves should be left closed anytime the unit is not in use.

6.1.19. The following steps apply only to abrasive blasters with electric systems. (See Figure 6.1) Connect the electric power cord (#72) to the blaster junction tee connector.

6.1.20. Connect the electric power cord alligator clips (#72) to the air compressor battery terminals or to another 12Vdc power source. See Figure 6.1.

⚠ CAUTION

Electric shock hazard. Abrasive blasters with electric deadman blast control systems must operate on low voltage supply (12-24 volts). To minimize shock hazard only use low voltage sources and use caution when connecting the power to the abrasive blaster. See Section 3.7.

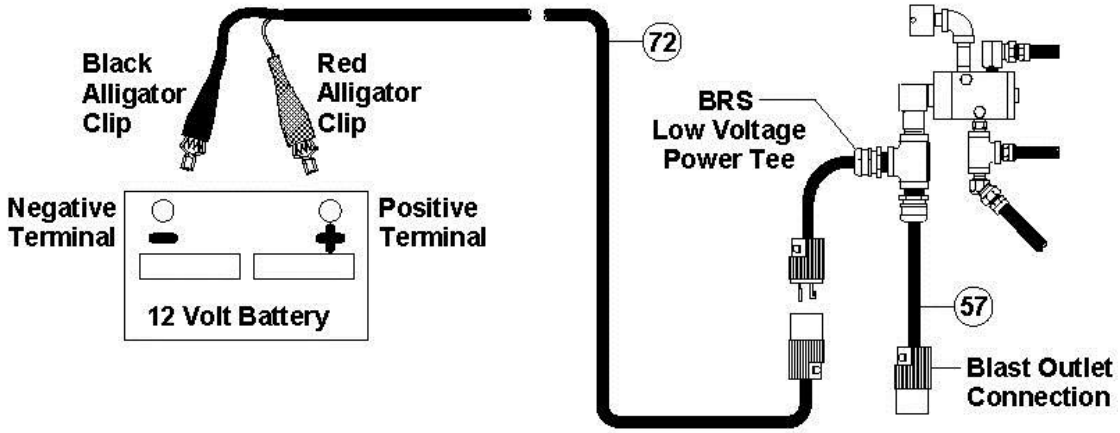


Figure 6.1 – Electric power connection

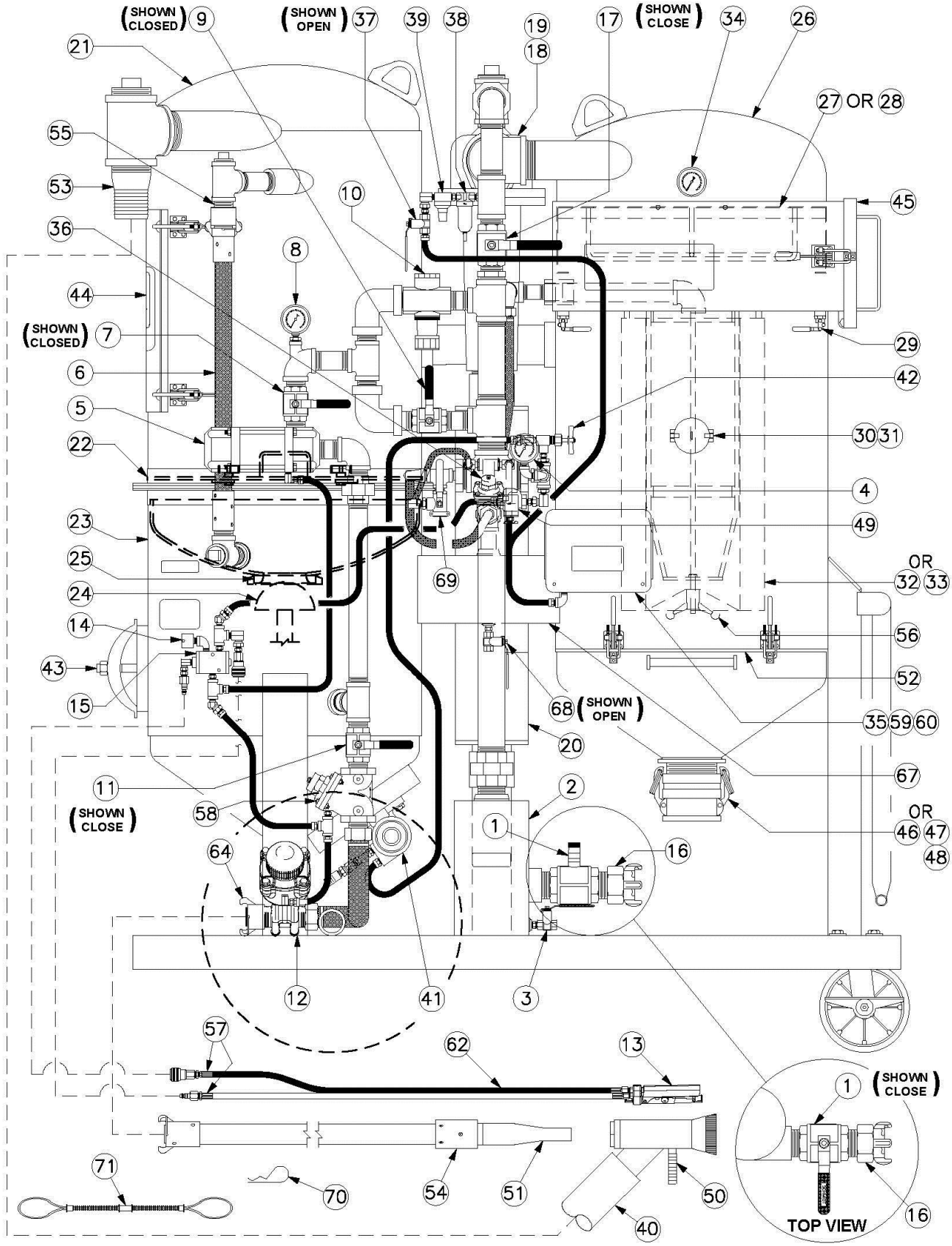


Figure 6.2 – Typical BRS Abrasive Blaster

6.2 BRS Abrasive Blaster Depressurizing Procedure (Blowdown)

A BRS blaster is a *depressurized system*; meaning that the blaster will depressurize when the deadman (#13) is released

6.2.1. Release the deadman (#13) to deactivate the ComboValve® (#5) and depressurize the abrasive blaster. The blast operation will stop.

⚠ 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 (#6) from the reclaimer (#21).

6.2.2. The blast vessel air pressure will exhaust through the blowdown hose (#6) and into the media reclaimer (#21). See Figure 6.4. The blowdown hose (#6) and fittings should be periodically inspected for wear. Refer to Section 8.0 for inspection and maintenance details.

⚠ 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 (#6) from the reclaimer (#21).

6.2.3. Disconnect the twinline disconnects (#57) of the deadman control system to disable the blast controls. This will protect against the automatic pressurization of the blast vessel. See Figure 6.3.

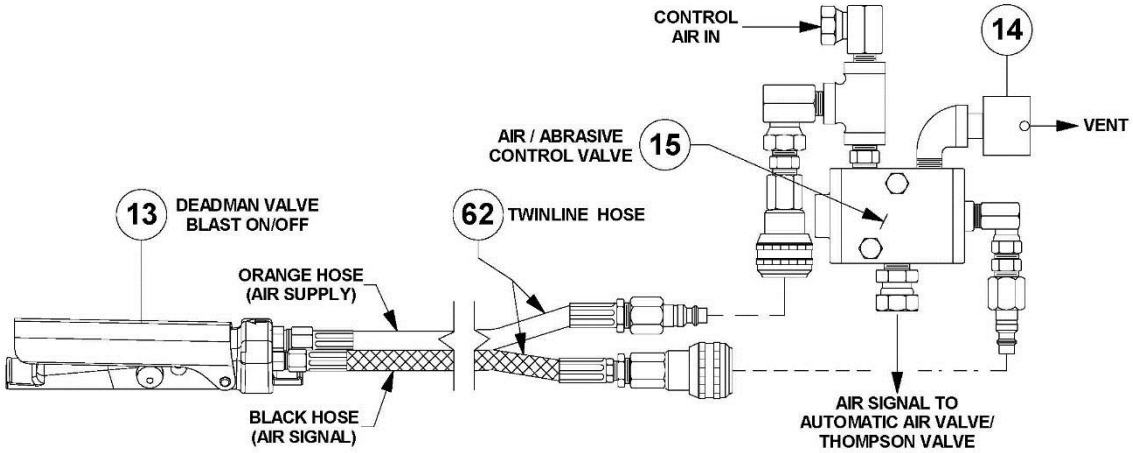


Figure 6.3 – Pneumatic Blast Control System

6.2.4. The blowdown hose (#6) and fittings should be periodically inspected for wear. Refer to Section 8.0 for inspection and maintenance details.

6.2.5. Close the air inlet ball valve (#1) to disable the blaster and the deadman blast control. The ball valve is closed when the handle is fully turned to the position shown in Figure 6.4 (handle perpendicular to body). The handle tab will bottom against the ball valve body in the closed position. **Note:** A faulty ball valve may allow air flow even in the closed position. Confirm air flow is stopped by opening the drain ball valve (#3) or by loosening the twinline connection (#57) to check for air flow. Replace faulty ball valves.

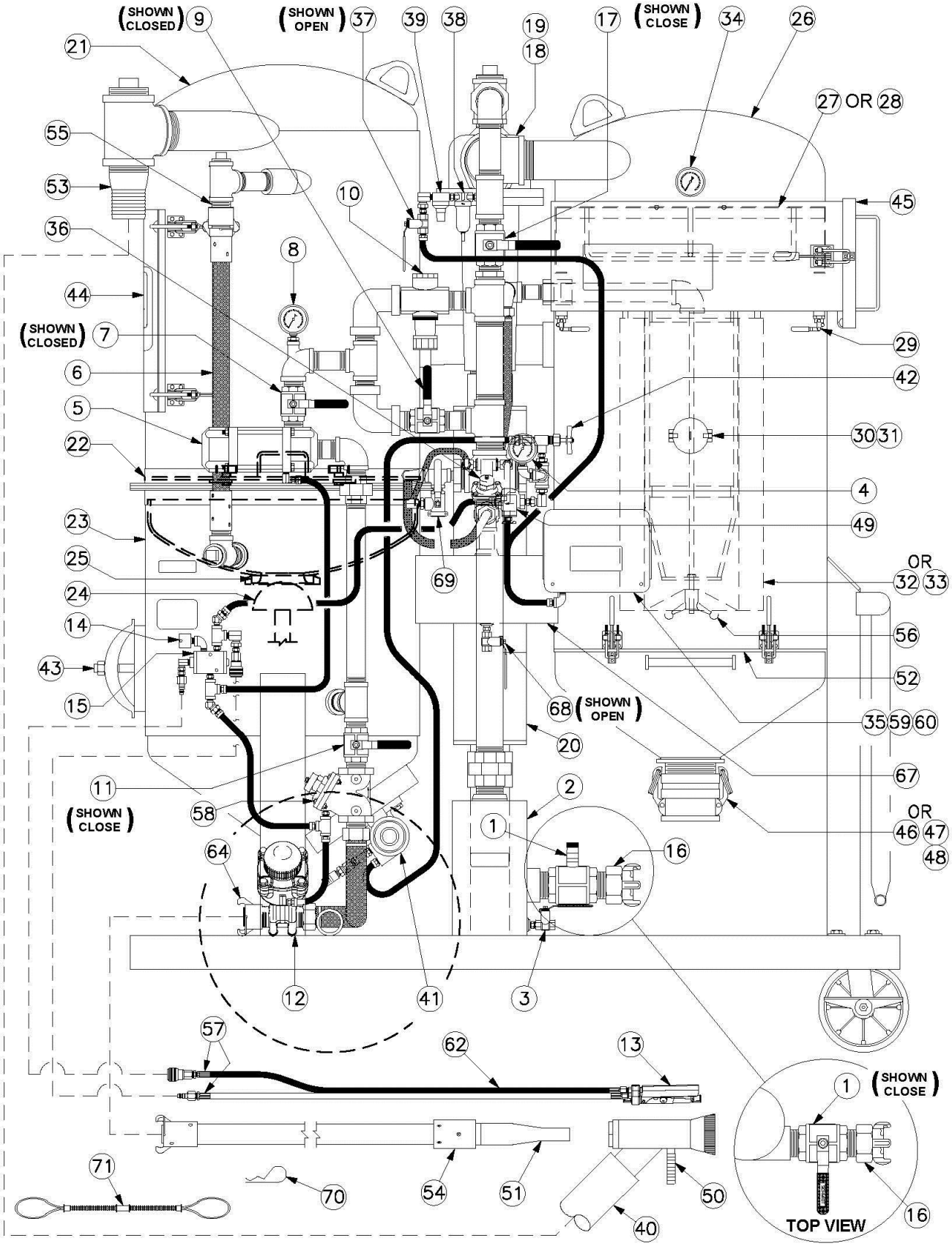


Figure 6.4 – Typical BRS Abrasive Blaster

6.3 Handway Cover Installation Procedures (See Figure 6.5(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 6.5(a).

b) Verify the size of the handway assembly by comparing the weld ring measurements from step “a” to the dimensions shown in Table 6.5(c).

c) Verify that the dimensions of the cover, crabs, bolts, and gasket match the corresponding dimensions given in Table 6.5(c). **Note:** The actual dimensions may vary by up to 1/4" from those given in Table 6.5(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. Once a month inspect the handway gasket for tears, cracks, or other wear. Replace if necessary.

6.3.3. Once a month 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. ***See Note below.**

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 6.5(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.

***Note:** Contact Axxiom Manufacturing or an Authorized Schmidt distributor and request information on the new SureFit™ Handway Gasket (patent pending) that eliminates the difficulty of aligning the gasket. Scan the QR Tag on the left to view a short video.

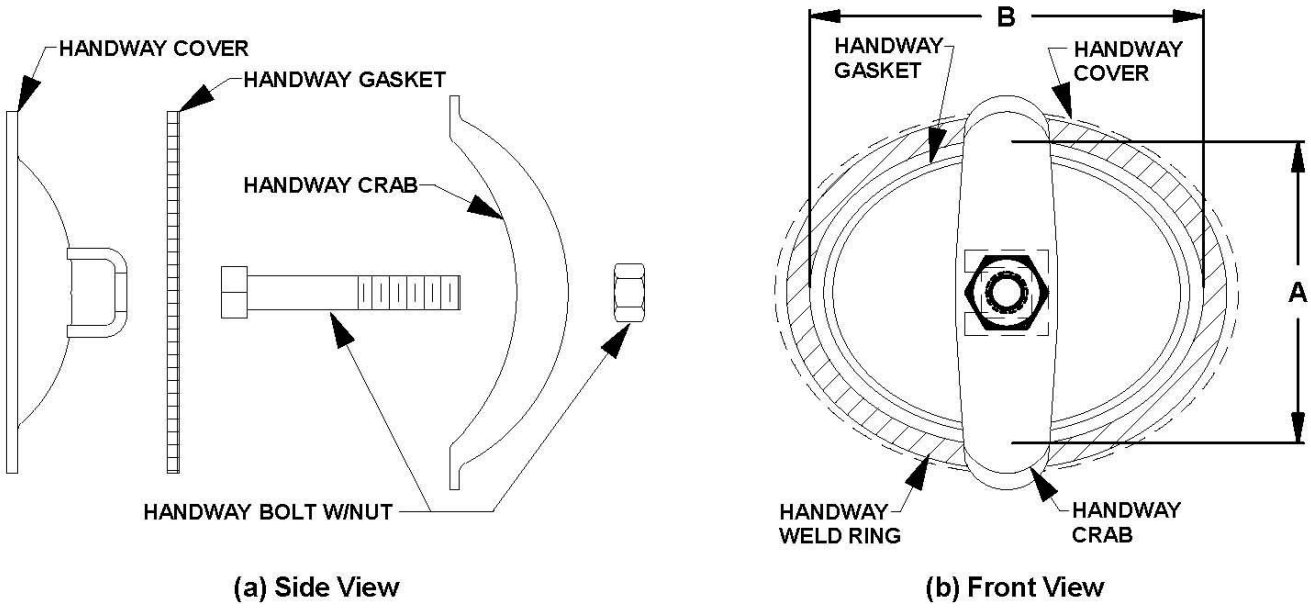


Figure 6.5 (a) – Handway Assembly

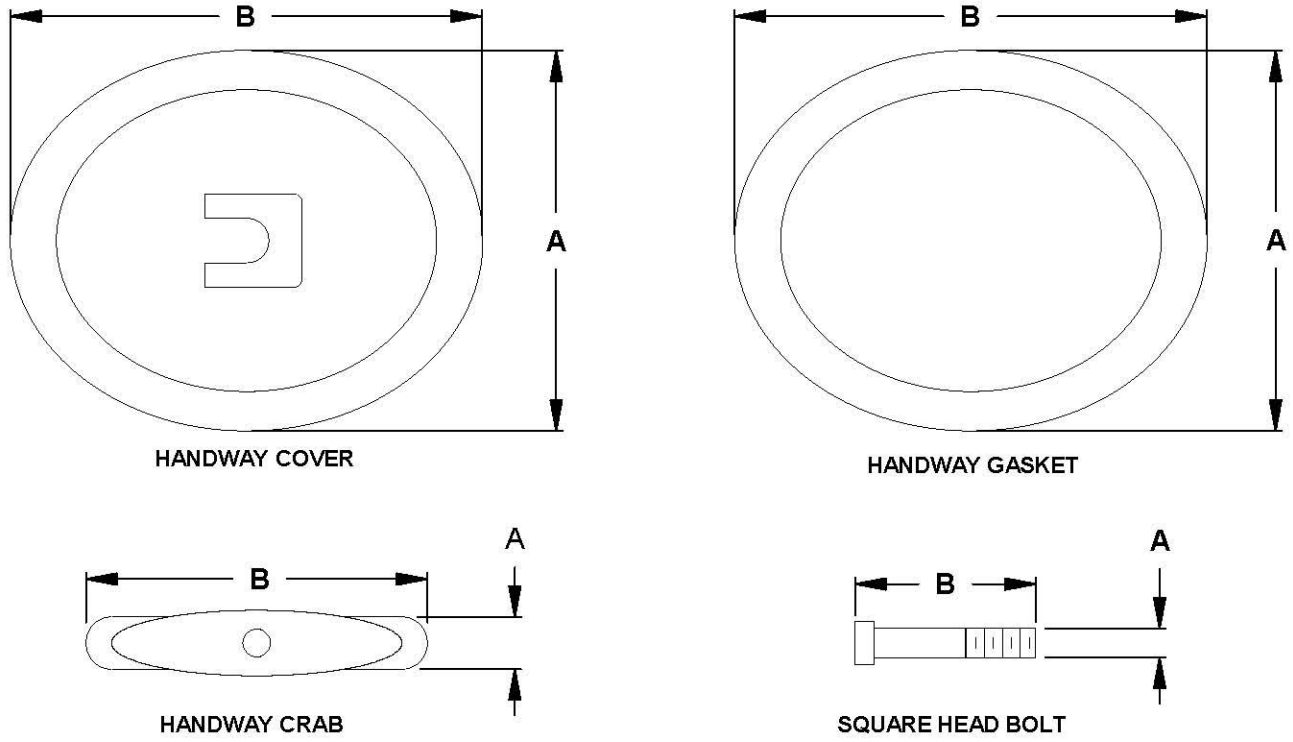


Figure 6.5 (b) – Handway Components

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 6.5 (c) – Handway Component Dimensions

7.0 Operating Instructions

7.1 Filling the BRS Abrasive Blast System with Abrasive

7.1.1. The BRS abrasive blaster must be completely depressurized before filling with abrasive. Follow the depressurizing procedure in Section 6.2. Disable the blast controls by disconnecting the twinline connections (#57).

⚠ 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 (#6) from the air wash reclaimer (#21).

7.1.2. Disconnect the vacuum hose (#40) from the blast head (#50).

7.1.3. Open the air inlet valve (#1).

7.1.4. Open ball valve (#17) to turn on vacuum pump (#18).

7.1.5. Open ball valve (#37) to start automatic pulse jet controls.

7.1.6. Do Not overfill, for this will cause media overflow into the dust collector when blasting with vacuum recovery (refer to Section 2.2 for capacity). Vacuum desired amount of dry media into the blast pot (#23). If the media being used is low density, it may be necessary to reduce the vacuum to protect against carryover of new media into the dust collector. The vacuum generated by the vacuum pump (#18) can be regulated by the supply ball valve (#17). To reduce the level of vacuum, slightly close the ball valve (#17). Note: If the unit is equipped with an adjustable air wash media reclaimer, the vacuum intensity at the cone tube (c) may also require adjustment. Refer to Section 5.19.

7.1.7. Close ball valve (#37) to stop automatic pulse jet controls.

7.1.8. Close ball valve (#17) to turn off vacuum pump (#18).

7.1.9. Re-attach vacuum hose (#40) to the BRS vacuum head (#50).

7.2 Open Cycle Blasting Operation (See Figure 7.1)

7.2.1. The BRS 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 BRS 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. After completion of the procedures in Section 6.1, the BRS unit is now ready for open cycle blasting (blasting without simultaneous vacuum recovery).

7.2.4. Open the vessel pressurization ball valve (#7) and manual choke valve (#11). Leave the choke valve 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® (#12).

7.2.5. For initial startup turn the Thompson Valve knob (#12) 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 ball valves (#3, #68) at the bottom of the inlet moisture separator (#2), and the reservoir (#67) to allow accumulated moisture to drain. This protect against moisture from entering the blast pot (#23) and dust collector (#26) during blasting. Once each day open the drain valves and petcock (#49) completely to blow out all moisture and dirt particles.

7.2.8. Turn on vessel media vibrator (#41) and set to the desired level of vibration by adjusting the angle valve (#42).

7.2.9. For initial startup, back the knob of the air pressure regulator (#10) 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.

7.2.10. To operate at full pressure (without the restriction of the regulator) open the bypass ball valve (#9). This allows full air pressure into the control piping regardless of the air regulator adjustment.

7.2.11. 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.

7.2.12. With one hand, grip the blast hose assembly (#54) 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 (#13). Air and blast abrasive will flow into the blast hose and out of the blast nozzle (#51). Observe the blast stream and the coating removal rate. Release the deadman lever to stop blasting. Note: If the BRS is equipped with the abrasive cut-off feature, the abrasive cut-off switch must be set to the "on" position to blast with media. See Section 5.13, 9.4(a) and 9.4(b).

Do Not aim the blast nozzle towards yourself or any person. A system malfunction or a blocked blast nozzle that clears can trigger accidental start up resulting in injury to personnel.

7.2.13. If necessary, adjust tank pressure by turning the knob on the tank/blast pressure regulator (#10). 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 (#8) until blasting begins. For the most accurate setting, this adjustment should be made while blasting. The blast pressure is indicated by the pressure gauge (#8) while blasting. Bypass valve (#9) must be closed. Note: Further tank/blast pressure adjustment may be required when actual blasting is begun.

7.2.14. If necessary, the abrasive flow can be adjusted with the knob on the Thompson Valve® (#12). 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.

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

7.2.16. If the closed cycle blasting method (blasting with simultaneous vacuum recovery) will be used the blast pressure and abrasive flow adjustments detailed in steps 7.2.9 through 7.2.15 must be made after completing the instructions given in Section 7.3.

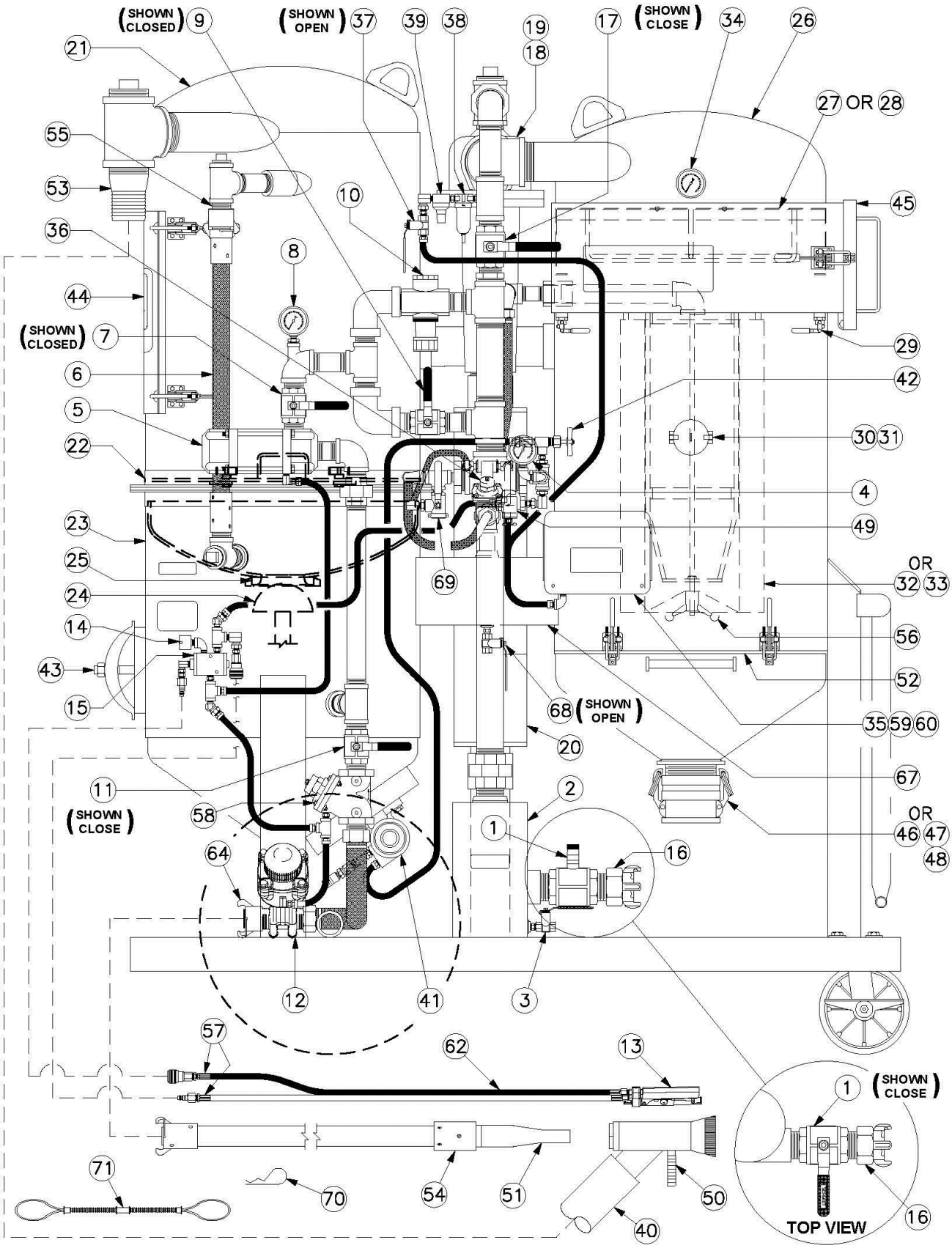


Figure 7.1 – Typical BRS Abrasive Blaster

7.3 Closed Cycle Blasting (simultaneous vacuum recovery)

7.3.1. The BRS 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) the BRS blast head (#50) and a vacuum hose (#40) are required. See Section 5.16.

7.3.3. Inspect the brushes on the BRS vacuum head (#50). Replace any that are worn or damaged. Refer to drawing in Section 9.14.

7.3.4. Connect the BRS vacuum head (#50) to the nozzle holder (#54) of the blast hose assembly.

7.3.5. Connect the vacuum hose (#40) between the blast head and the reclaimer vacuum inlet (#53). Refer to Figure 7.1.

7.3.6. Open ball valve (#17) to activate vacuum system.

7.3.7. Open ball valve (#37) to start the automatic pulse

7.3.8. Adjust the pulse cycle as required during blast/reclaim operation. The interval between pulses is adjusted by the upper knob (T1) on the oscillator (#59). The pulse length is adjusted by the lower knob (T2). The pulse effect can be seen by a decrease in the vacuum reading on the pressure gauge (#34). **Caution:** An excessive pulse length will cause the pulse air to overpower the vacuum resulting in reduced abrasive recovery capabilities. Refer to drawing 9.6 and 9.8.

7.3.9. Place the BRS blast head (#50) against the surface to be blasted.

7.3.10. With one hand grip the blast head assembly (#50) 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 (#13). Air and blast abrasive will flow into the blast hose and out of the blast nozzle (#51). Release the deadman lever to stop blasting.

Do Not aim the blast nozzle towards yourself or any person. A system malfunction or a blocked blast nozzle that clears can trigger accidental start up resulting in injury to personnel.

7.3.11. Make necessary adjustments to the blast pressure and abrasive flow as detailed in steps 7.2.9 through 7.2.15 in Section 7.2.

7.3.12. 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 7.1)

7.4.1. Close ball valve (#37) to stop automatic pulse jet controls.

7.4.2. Close ball valve (#17) to stop vacuum.

7.4.3. Close the air inlet ball valve (#1). The ball valve is closed when the handle is fully turned to the position shown in Figure 7.1 (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 and contaminate the controls.

7.4.4. Completely open ball valves (#3) at the bottom of the inlet moisture separator (#2), and the reservoir drain ball valve (#68) to allow all the accumulated moisture to be drained out. Close the ball valves after draining.

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

⚠ CAUTION

Steel abrasive left inside the blast vessel can be contaminated by moisture and solidify inside causing costly damage.

8.0 Maintenance and Inspection Instructions

DANGER

The BRS 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. 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 weekly 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 pressure vessel (#23) 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. Refer to the ASME Data Report for the vessel minimum thickness.

Check the pressure vessel internal piping for corrosion, cracks, wear, holes, or any other damage. Repair or replace damaged components. See Figure 8.1 and Section 9.12.

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. Check the popup gap and alignment prior to initial usage and weekly thereafter. Inspect the popup as follows:

a) Depressurize the BRS abrasive blaster per Section 6.2.
b) Disconnect air supply hose from the crowfoot (#16).
c) Inspect the popup gasket (#25) and popup head (#24) 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 5/8" and 7/8". 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 hands and fingers away from popup. Disconnect air supply prior to performing popup maintenance.

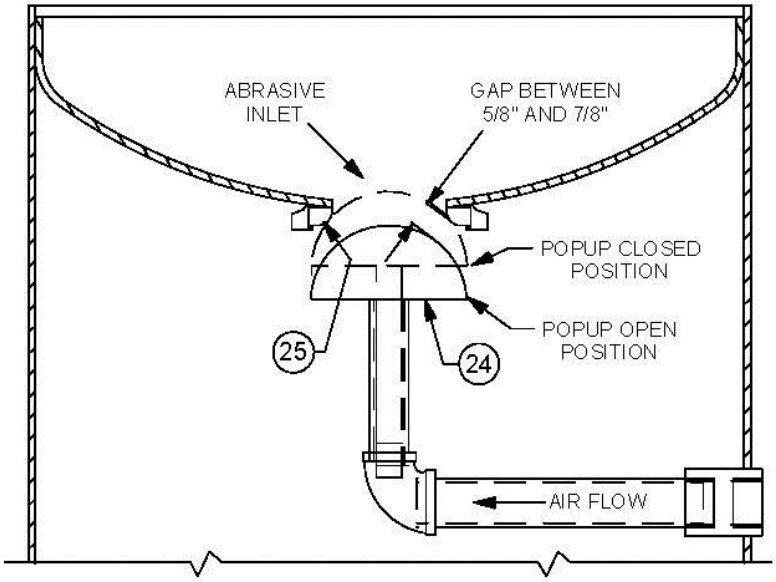


Figure 8.1 – Standard Popup Assembly

8.5. ***Blast and Air Hoses, Piping, Pipe Fittings, and Wires:*** All air hoses, blast hoses, control hoses, pipe, pipe fittings, and wires are wear items on any abrasive blaster. These components should be inspected daily for air leaks, cracks, holes, dry rotting, cuts, or any other damage. Repair or replace any components that show any signs of wear or damage.

⚠ DANGER

Damaged hoses, piping, pipe fittings or wires 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 where the blast hose wall was thinned. These areas can rupture while blasting. Check the full length of the blast hose assembly for soft spots caused by wear. To protect against serious injury to personnel replace blast hoses with soft spots. **Note:** Static electricity is generated by the abrasive flow through the blast hose. To protect against static electrical shock to operating personnel only use static dissipating blast hose and properly ground the abrasive blaster.

⚠ WARNING

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

⚠ WARNING

Longer blast hoses require longer time to dissipate the blast stream when the deadman is released to end the blast operation. This extended dissipation time increases the risk of injury if there is an accidental loss of control of the blast hose.

⚠ CAUTION

Static electric shock hazard. To minimize the chance of static electric shock install a grounding strap on the abrasive blaster and only use static dissipating blast hose.

8.6. ***Blast and Air Hose Couplings:*** All air hose, blast hose, and threaded couplings have two pin holes that align when connected. To protect against 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.

⚠ WARNING

Failure to install safety pins on all air and blast hose couplings can result in hose disconnects and could result in serious injury or death.

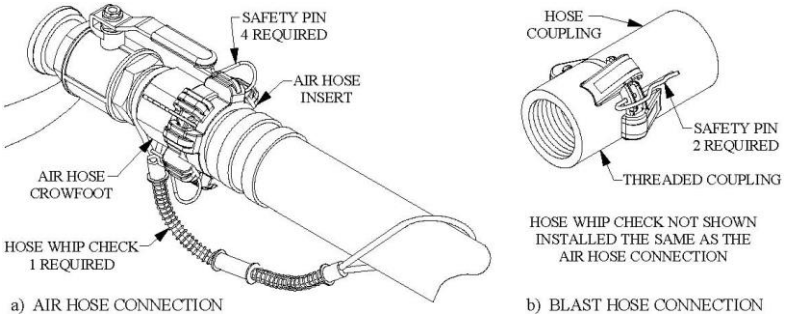


Figure 8.2 – Hose Connection Disconnect Protection

8.7. ***Blast and Air Hose Gaskets:*** All air hose, blast hose, and threaded couplings have gaskets that seal the connection. To reduce 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 9.0.

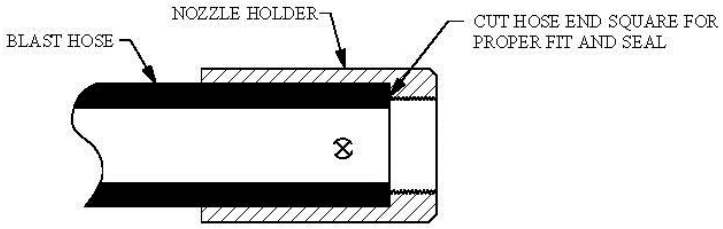


Figure 8.3 – Hose End Fit up

8.8. ***Blast Nozzle(s):*** Remove the blast nozzle (#51) 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.

8.9. ***Valves:*** Thompson® Valves, Automatic air valves, control valves, and deadman valves should be disassembled and inspected quarterly, or more frequently if heavily used. Ball valves should open and close without difficulty and should not leak air. Repair or replace any component that shows signs of wear or damage. 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 Section 9.0.

⚠ DANGER

Depressurize vessel before performing any maintenance. See Section 6.2. Removing the Thompson valve bolts with the abrasive 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.

8.10. ***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.

8.11. ***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.

8.12. ***Combo Blowdown:*** The blowdown hose (#6) that passes through the Combo Valve® (#5) is a 3/4" blast hose. Abrasive carry-over will thin the blowdown hose wall and eventually wear a hole through the hose. Excessive thinning will prevent the Combo Valve pinch ram from sealing the exhaust flow and result in equipment malfunction. The abrasive carry-over will also wear the pipe fittings upstream and downstream. Depressurize the BRS and check hose condition weekly. (See Section 6.2) Replace as needed, be sure that the hose does not make any tight bends anywhere between the blast vessel and the reclaimer because this can cause premature wearing. Also, replace the pipe fittings up and downstream of the hose. These fittings are the upstream 1 ¼" x 3" nipple, 1 ¼" tee, 1 ¼" plug, downstream the blast hose couplings, 1 ¼" #4 suppression nipple, 1 ¼" tee, 1 ¼" plug and 1 ¼" x 3" nipple. (See Section 9.1 and 9.2)

8.13. ***Reclaim Hopper Screen:*** The abrasive screen (#22) inside the reclaimer hopper 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 (#44).

8.14. ***Dust Collector:*** During vacuum recovery of abrasive the depleted abrasive accumulates in the bottom of the dust collector (#26). The dust collector must be drained weekly. Place a container below the dust collector then open the camlock coupling (#46) 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.

8.15. ***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 BRS 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.

8.15.1. Manual pulsing

The first cleaning step should be manual pulsing. This is done by opening the manual pulse ball valve (#69) to provide a burst of air inside the filter to loosen dust particles from the pleated surface. Also manual pulse during periods of blast stoppage

8.15.2. 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.

8.15.3. 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 crisscrossing pattern across the direction of the pleats this could cause damage to paper element filters and decreases cleaning efficiency.

8.15.4. 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, Axxiom Manufacturing 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.

8.15.5. 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.

8.16. ***Vacuum Head***

As the brushes of the vacuum head wear they lose their sealing capabilities, therefore they should be replaced after approximately 25 hours of use. In addition, the vacuum head contains an inner wear tube to protect against the abrasive from wearing through the body of the vacuum head. This wear tube should be inspected periodically and replaced after approximately 25 hours of use. See Section 9.14.

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

8.18. ***Air Inlet Moisture Separator:*** The air inlet moisture separator (#2) should be cleaned quarterly to improve air flow. Remove the fittings located in the top of the tank and pressure wash downward through the tank couplings. Clean thoroughly before placing back into service.

8.19. *Maintenance Schedules Quick Reference Charts*

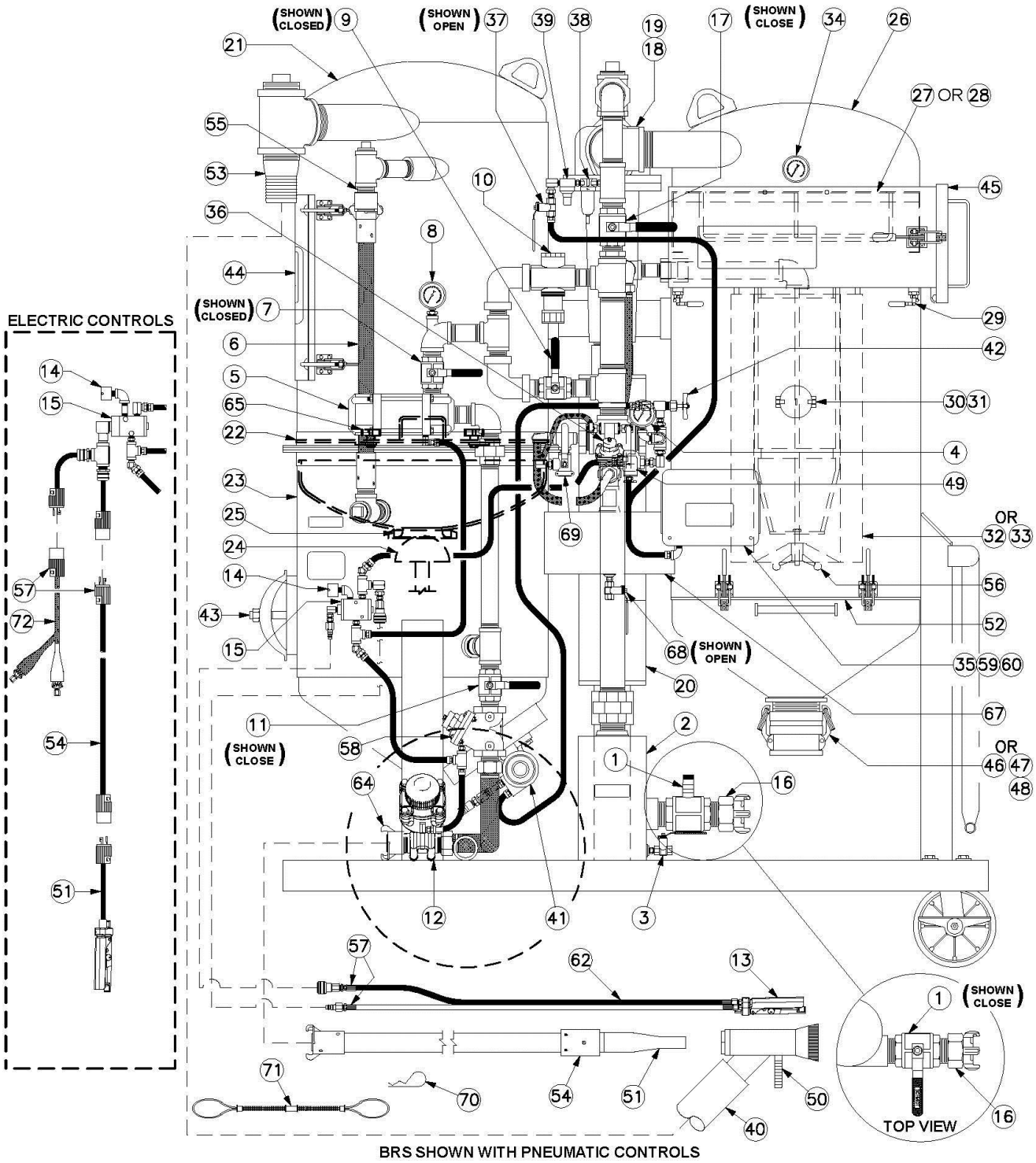
BRS ABRASIVE BLASTER MAINTENANCE SCHEDULE					
Item	**Maintenance Required**	**Daily**	**Weekly**	**Monthly**	**Quarterly**
Blaster Vessel	Hydrostatic Test See Section 8.1	As required by state law and/or local authorities			
Blaster Vessel	Check for exterior damage (corrosion, dents, bulges). See Section 8.2	X			
Blaster Vessel	Check for interior wear, corrosion, & pitting. Check internal piping for wear or damage. See Section 8.3				X
Popup	Check sealing surfaces, alignment and gasket to popup gap. See Section 8.4		X		
Blast & Air Hoses	Check air & blast hoses for soft spots, wear, cracks, or air leaks. See Section 8.5	X			
Remote Control Hoses	Check air & blast hoses for soft spots, wear, cracks, or air leaks. See Section 8.5	X			
Blaster Piping & Pipe Fittings	Check pipe & pipe fittings for wear, cracks, or air leaks See Section 8.5	X			
Blast & Air Hose Couplings	Check for safety pins and whip checks See Section 8.6	X			
Hose Coupling Gaskets	Check for leaks ah the air, blast, and threaded hose coupling gaskets See Section 8.7	X			
Blast Nozzle	Check blast nozzle threads and jacket and for wear, damage, or air leaks See Section 8.8	X			
Valves	Disassemble, inspect, and lubricate. Check for proper operation. See Section 8.9				X
Personal Protective Equipment	Check for presence and condition of all personal protective equipment See Section 3.10 and 8.10	X			
Warning Decals	Check for presence and condition of all warning decals. See Sections 0.0 and 8.11			X	
Combovalve® Blowdown Hose	Check blowdown hose for wear or thinning. Check pipe tee, plug, and nipple for wear. See Section 8.12		X		
Reclaim Hopper Screen	Clean trash from Abrasive screen See Section 8.13	X			
Dust Collector Drain	Drain dust from dust collector See Section 8.14		X		
Dust Collector Air Filter	Clean and inspect dust collector filter See Section 8.15			X	
Handway Assembly	Check gasket for wear, cracking, or dry rotting. Check sealing surfaces for damage. See Sections 6.3 and 8.17.			X	
Remote Control Wires	Check wiring for bare spots, fraying, cuts, or cracks See Section 8.5	X			
Air inlet moisture separator	Degrease internal demister element See Section 8.18.				X

This page was intentionally left blank.

9.0 Drawings and Parts Lists

The following pages contain drawings representing typical blast control systems and components. To insure the proper operation of the blast system only use Schmidt® original factory replacement parts furnished by an authorized Schmidt distributor. See Section 1.38 and Section 12.2.12.

9.1(a) BRS Abrasive Blaster



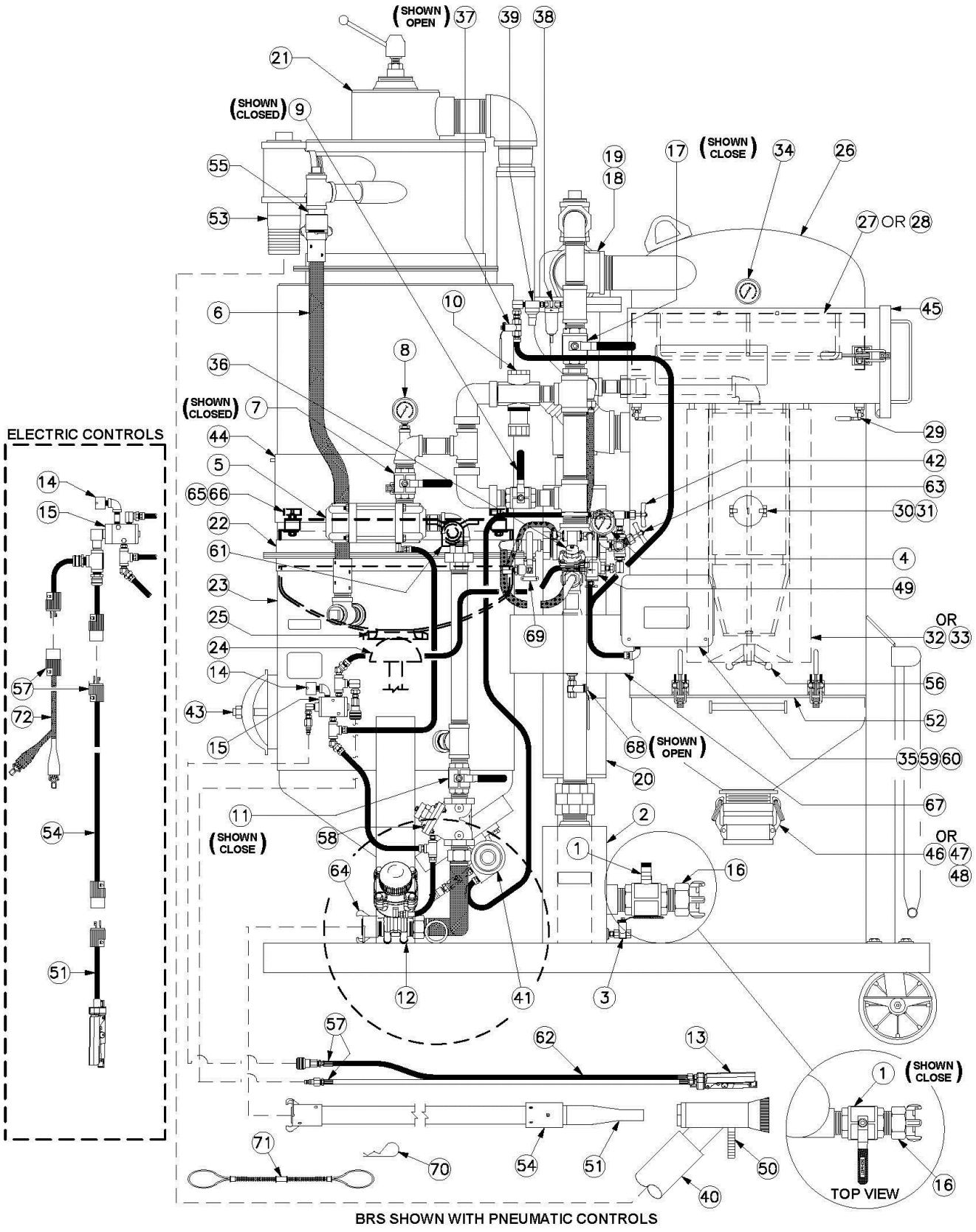
9.1(b) BRS Abrasive Blast System Parts List

ITEM	PART NUMBER	DESCRIPTION
1	2401-509	Ball valve, 2" full port
2	1200-999-23	Inlet moisture separator
3	2401-502	Ball valve, 1/4" full port
4	2010-009-01	Pressure gauge, 0-160 psi
5	2223-000	Combo Valve, 1-1/4"
6	4104-005	Hose, 4-ply 3/4" (Specify length)
7	2401-507	Ball valve, 1-1/4" full port
8	2010-009-01	Pressure gauge, 0-160 psi
9	2401-507	Ball valve, 1-1/4" full port
10	2003-007	Air regulator, 1-1/4"
11	2401-507	Ball valve, 1-1/4" full port
12	2152-107	Thompson valve II, 1-1/4" urethane
13	2263-002	Deadman valve, G2 pneumatic
*	2263-402	Deadman valve, G2 electric 12VDC
14	2013-402	Dust eliminator, 1/4"
15	2229-000	Control valve, pnuematic
*	2229-100	Control valve, electric 12vdc
16	4211-109	Crowfoot, 2" 4-lug
17	2401-508	Ball valve, 1-1/2" full port
18	2018-011	Eductor, urethane 3"
19	2018-111-01	Eductor nozzle, 150 cfm
	2018-211-01	Eductor nozzle, 225 cfm
	2018-311-01	Eductor nozzle, 350 cfm
	2018-411-01	Eductor nozzle, 440 cfm
20	2011-011	Muffler assembly, 3"
21	8031-020-04	BRS 2.0 cyclone media reclaimer
	8031-030-04	BRS 3.5 cyclone media reclaimer
	8031-060-04	BRS 6.5 cyclone media reclaimer
22	8031-000-34	BRS 2.0/3.5/6.5 reclaimer screen
23	8031-020-01	BRS 2.0 cf pressure vessel
	8031-030-01	BRS 3.5 cf pressure vessel
	8031-060-01	BRS 6.5 cf pressure vessel
24	2100-010	Pop-up head, 3 & 6 bag vessel
25	2100-011	Pop-up gasket, 3 & 6 bag vessel
26	8031-020-02	BRS 2.0 dust collector
	8031-030-02	BRS 3.5/6.5 dust collector
27	8031-000-68	BRS demister filter, 18" x 18"
	8031-000-12	BRS demister filter, 24" x 24"
28	8031-000-40	BRS hepa filter, 18" x 18"
	8031-000-11	BRS hepa filter, 24" x 24"
29	8031-000-05	BRS filter retractable locator
30	4222-409	Camlock coupling, type f 2"
31	4223-409	Camlock coupling, type dc 2"
32	8031-000-09	BRS dry filter, 12" polyester element
	8031-000-24	BRS dry filter, 12" paper element
	8031-000-83	BRS dry filter, 12" high output
33	8031-000-10	BRS dry filter, 18" polyester element
	8031-000-25	BRS dry filter, 18" paper element
34	2010-026	Pressure gauge, 30 Vac-0-15 psi
35	8031-000-17	BRS pulse air control box (See section 9.3)
36	2123-106	Automatic air valve, n.c. 1"
	2123-107	Automatic air valve, n.c. 1-1/4"
37	2401-502	Ball valve, 1/4" full port
38	2302-102-05	Air Filter, 1/4" 5 micron
39	2001-010	Regulator, non-adjustable 1/4"
40	4107-011-50	Vacuum hose, 3"

ITEM	PART NUMBER	DESCRIPTION
41	2020-013	Vibrator, 2.0 vessel
	2020-025	Vibrator, 3.5/6.5 vessel
42	2430-804	Angle valve, 1/4" for vessel vibrator
43	7000-001-11	Handway crab assembly, 6" x 8"
	7000-001-18	Handway gasket, 6" x 8" (Surefit)
	7000-001-06	Handway gasket, 6" x 8"
44	8031-000-77	BRS 2.0 cyclone reclaimer door gasket
	8031-000-31	BRS 3.5/6.5 cyclone reclaimer door gasket
45	8031-000-70	BRS 2.0 dust collector HEPA filter door gasket
	8031-000-04	BRS 3.5/6.5 dust collector HEPA filter door gasket
46	2401-507	Ball valve, 1-1/4" full port
47	4222-411	Camlock coupling, type f 3"
	4222-413	Camlock coupling, type f 4"
48	4223-411	Camlock coupling, type dc 3"
	4223-413	Camlock coupling, type dc 4"
49	2301-902-90	Strainer, bronze 1/4" 90 micron
50	8031-000-36	BRS vacuum workhead, 3" style II
	8031-000-37	Vacuum workhead outer 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.
51	5000-XXX	Blast nozzle (specify size)
52	8031-000-69	BRS 2.0 dust collector head gasket
	8031-000-03	BRS 3.5/6.5 dust collector head gasket
53	4212-011	K.C. nipple, 3"
54	4215-xxx	Nozzle holder (specify size)
	4104-40x-0x	Blast hose (specify size and length)
	4213-4xx	Hose coupling (specify size)
*	7074-xxx	Extension Cord (specify length)
55	8407-000-43	Blowdown flow control nipple #4 (1/4" orifice)
56	8031-000-27	BRS wingnut
57	4224-300-02	Quick connect plug, 1/4"
	4224-301-02	Quick connect socket, 1/4"
*	7109-301	Male Plug, 3-prong twist-lock
*	7109-300	Female connector, 3-prong twist-lock
58	2123-107	Automatic air valve, n.c. 1-1/4"
59	8031-000-18	BRS pulse air pneumatic oscillator (See Secion 9.3)
60	2229-000	Control valve, pneumatic (See section 9.3 & 9.4)
61		
62	4100-501	Twinline hose assembly, 55 ft
63		
64	4214-107	Threaded coupling, 1-1/4" with gasket
65	8031-000-42	BRS vessel screen knob
66		
67	xxx	Pulse air reservoir
68	2401-502	Ball valve, 1/4" full port
69	2403-302	Ball valve, 3-way 1/4"
70	7119-002	Safety pin, air/blast hose coupling
71	8710-98778	Hose whip check (safety cable)
72 *	7072-012	Power cord, 25 ft. w/ alligator clips

* Part is used in electric controls

9.2(a) BRS Airwash Abrasive Blaster



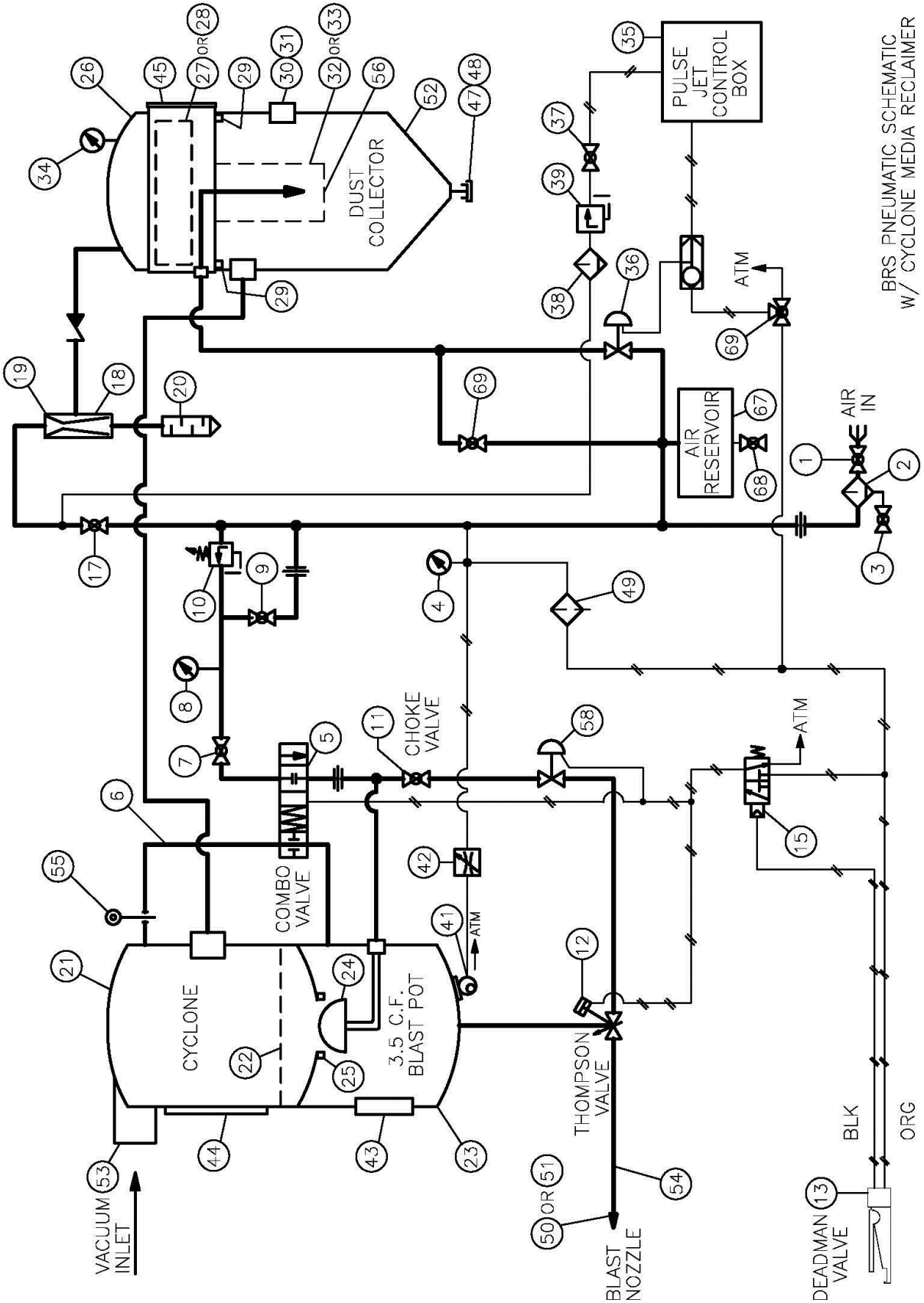
9.2(b) BRS Airwash Abrasive Blast System Parts List (continued)

ITEM	PART NUMBER	DESCRIPTION
1	2401-509	Ball valve, 2" full port
2	1200-999-23	Inlet moisture separator
3	2401-502	Ball valve, 1/4" full port
4	2010-009-01	Pressure gauge, 0-160 psi
5	2223-000	Combo Valve, 1-1/4"
6	4104-005	Hose, 4-ply 3/4" (Specify length)
7	2401-507	Ball valve, 1-1/4" full port
8	2010-009-01	Pressure gauge, 0-160 psi
9	2401-507	Ball valve, 1-1/4" full port
10	2003-007	Air regulator, 1-1/4"
11	2401-507	Ball valve, 1-1/4" full port
12	2152-107	Thompson valve II, 1-1/4" urethane
13	2263-002	Deadman valve, G2 pneumatic
*	2263-402	Deadman valve, G2 electric
14	2013-402	Dust eliminator, 1/4"
15	2229-000	Control valve, pnuematic
*	2229-100	Deadman valve, G2 electric 12VDC
16	4211-109	Crowfoot, 2" 4-lug
17	2401-508	Ball valve, 1-1/2" full port
18	2018-011	Eductor, urethane 3"
19	2018-111-01	Eductor nozzle, 150 cfm
	2018-211-01	Eductor nozzle, 225 cfm
	2018-311-01	Eductor nozzle, 350 cfm
	2018-411-01	Eductor nozzle, 440 cfm
20	2011-011	Muffler assembly, 3"
21	8031-020-07P	BRS air wash media reclaimer
22	5011-999-01	BRS 2.0 air wash reclaimer screen
	5011-999-02	BRS 3.5/6.5 air wash reclaimer screen
23	8031-020-01	BRS 2.0 cf pressure vessel
	8031-030-01	BRS 3.5 cf pressure vessel
	8031-060-01	BRS 6.5 cf pressure vessel
24	2100-010	Pop-up head, 3 & 6 bag vessel
25	2100-011	Pop-up gasket, 3 & 6 bag vessel
26	8031-020-02	BRS 2.0 dust collector
	8031-030-02	BRS 3.5/6.5 dust collector
27	8031-000-68	BRS demister filter, 18" x 18"
	8031-000-12	BRS demister filter, 24" x 24"
28	8031-000-40	BRS hepa filter, 18" x 18"
	8031-000-11	BRS hepa filter, 24" x 24"
29	8031-000-05	BRS filter retractable locator
30	4222-409	Camlock coupling, type f 2"
31	4223-409	Camlock coupling, type dc 2"
32	8031-000-09	BRS dry filter, 12" polyester element
	8031-000-24	BRS dry filter, 12" paper element
	8031-000-83	BRS dry filter, 12" high output
33	8031-000-10	BRS dry filter, 18" polyester element
	8031-000-25	BRS dry filter, 18" paper element
34	2010-026	Pressure gauge, 30 Vac-0-15 psi
35	8031-000-17	BRS pulse air control box (See section 9.3)
36	2123-106	Automatic air valve, n.c. 1"
	2123-107	Automatic air valve, n.c. 1-1/4"
37	2401-502	Ball valve, 1/4" full port
38	2302-102-05	Air Filter, 1/4" 5 micron
39	2001-010	Regulator, non-adjustable 1/4"
40	4107-011-50	Vacuum hose, 3"

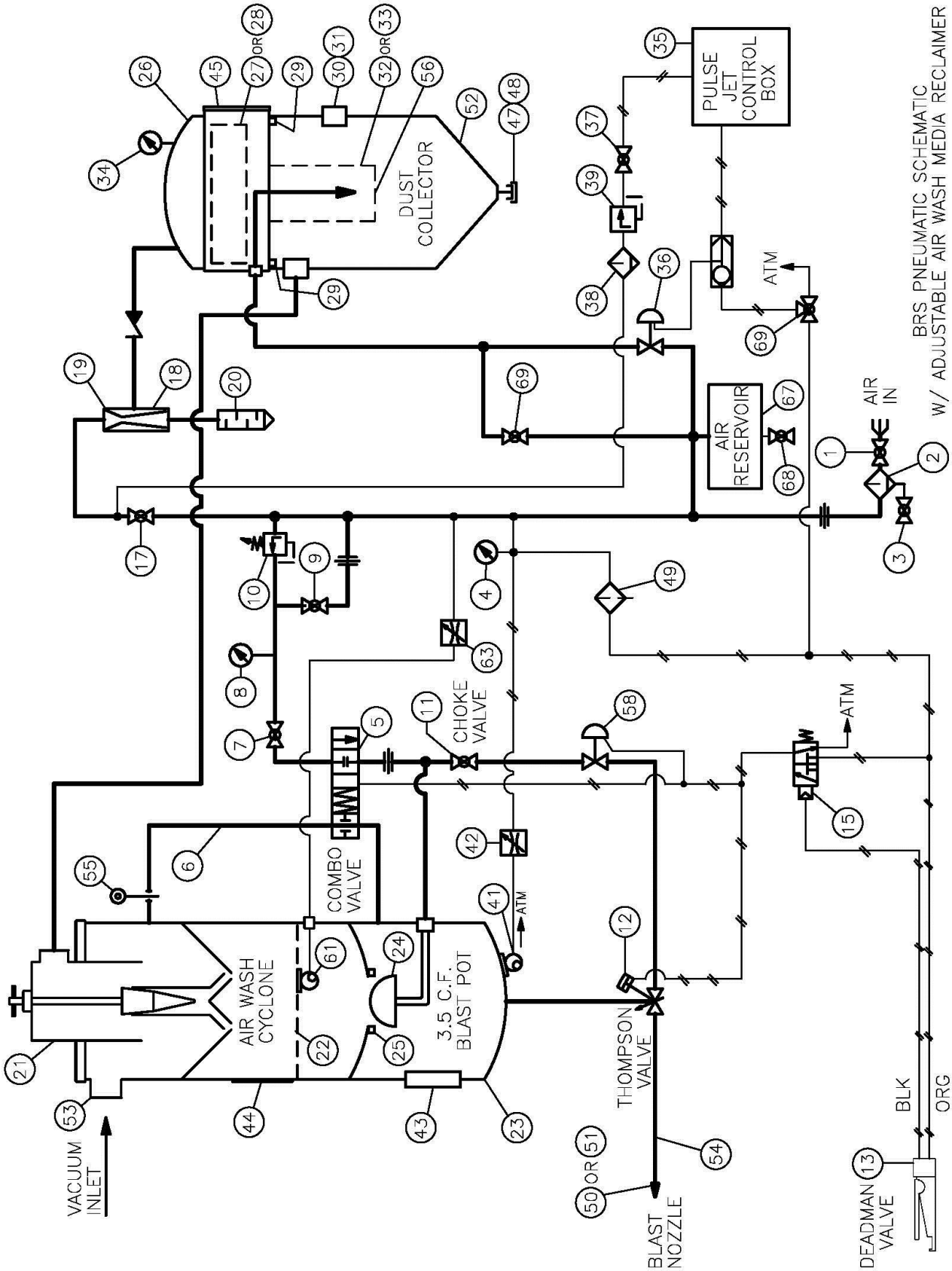
ITEM	PART NUMBER	DESCRIPTION
41	2020-013	Vibrator, 2.0 vessel
	2020-025	Vibrator, 3.5/6.5 vessel
42	2430-804	Angle valve, 1/4" for vessel vibrator
43	7000-001-11	Handway crab assembly, 6" x 8"
	7000-001-18	Handway gasket, 6" x 8" (Surefit)
	7000-001-06	Handway gasket, 6" x 8"
44	8031-000-71	BRS 2.0 air wash reclaimer door gasket
	8031-000-94	BRS 3.5/6.5 air wash reclaimer door gasket
45	8031-000-70	BRS 2.0 dust collector HEPA filter door gasket
	8031-000-04	BRS 3.5/6.5 dust collector HEPA filter door gasket
46	2401-507	Ball valve, 1-1/4" full port
47	4222-411	Camlock coupling, type f 3"
	4222-413	Camlock coupling, type f 4"
48	4223-411	Camlock coupling, type dc 3"
	4223-413	Camlock coupling, type dc 4"
49	2301-902-90	Strainer, bronze 1/4" 90 micron
50	8031-000-36	BRS vacuum workhead, 3" style II
	8031-000-37	Vacuum workhead outer 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.
51	5000-XXX	Blast nozzle (specify size)
52	8031-000-69	BRS 2.0 dust collector head gasket
	8031-000-03	BRS 3.5/6.5 dust collector head gasket
53	4212-011	K.C. nipple, 3"
54	4215-xxx	Nozzle holder (specify size)
	4104-40x-0x	Blast hose (specify size and length)
	4213-4xx	Hose coupling (specify size)
*	7074-xxx	Extension Cord (specify length)
55	8407-000-43	Blowdown flow control nipple #4 (1/4" orifice)
56	8031-000-27	BRS wingnut
57	4224-300-02	Quick connect plug, 1/4"
	4224-301-02	Quick connect socket, 1/4"
*	7109-301	Male Plug, 3-prong twist-lock
*	7109-300	Female connector, 3-prong twist-lock
58	2123-107	Automatic air valve, n.c. 1-1/4"
59	8031-000-18	BRS pulse air pneumatic oscillator (See Secion 9.3)
60	2229-000	Control valve, pneumatic (See section 9.3 & 9.4)
61	2020-013	Vibrator, media screen (See Section 9.3 & 9.4)
62	4100-501	Twinline hose assembly, 55 ft
63	2430-804	Angle valve, 1/4" for screen vibrator
64	4214-107	Threaded coupling, 1-1/4" with gasket
65	8031-000-42	BRS vessel screen knob
66	8031-000-46	BRS screen isolator
67	xxx	Pulse air reservoir
68	2401-502	Ball valve, 1/4" full port
69	2403-302	Ball valve, 3-way 1/4"
70	7119-002	Safety pin, air/blast hose coupling
71	8710-98778	Hose whip check (safety cable)
72 *	7072-012	Power cord, 25 ft. w/ alligator clips

* Part is used in electric controls

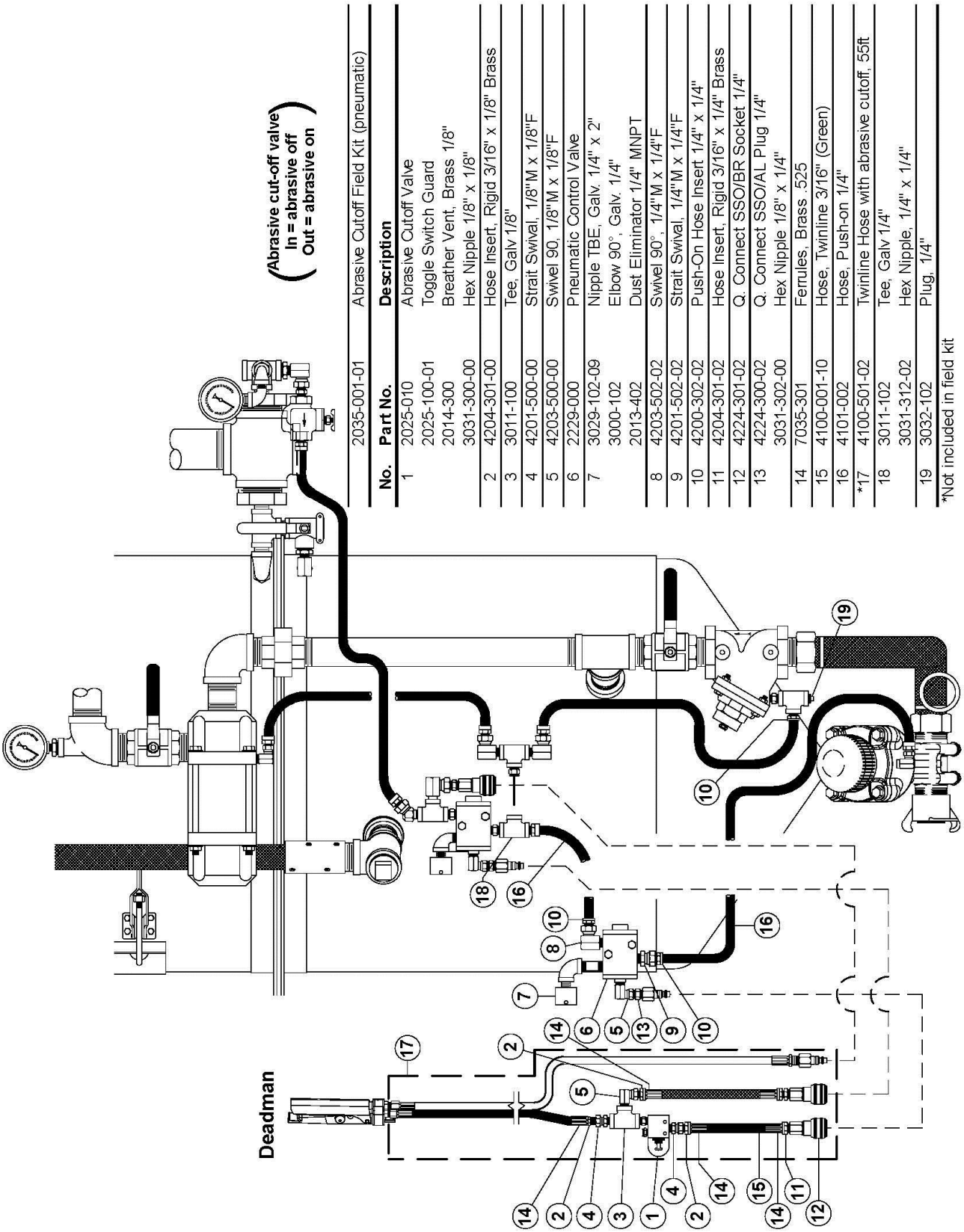
9.3(a) BRS Abrasive Blaster Pneumatic Schematic



9.3(b) BRS Wash Abrasive Blaster Pneumatic Schematic



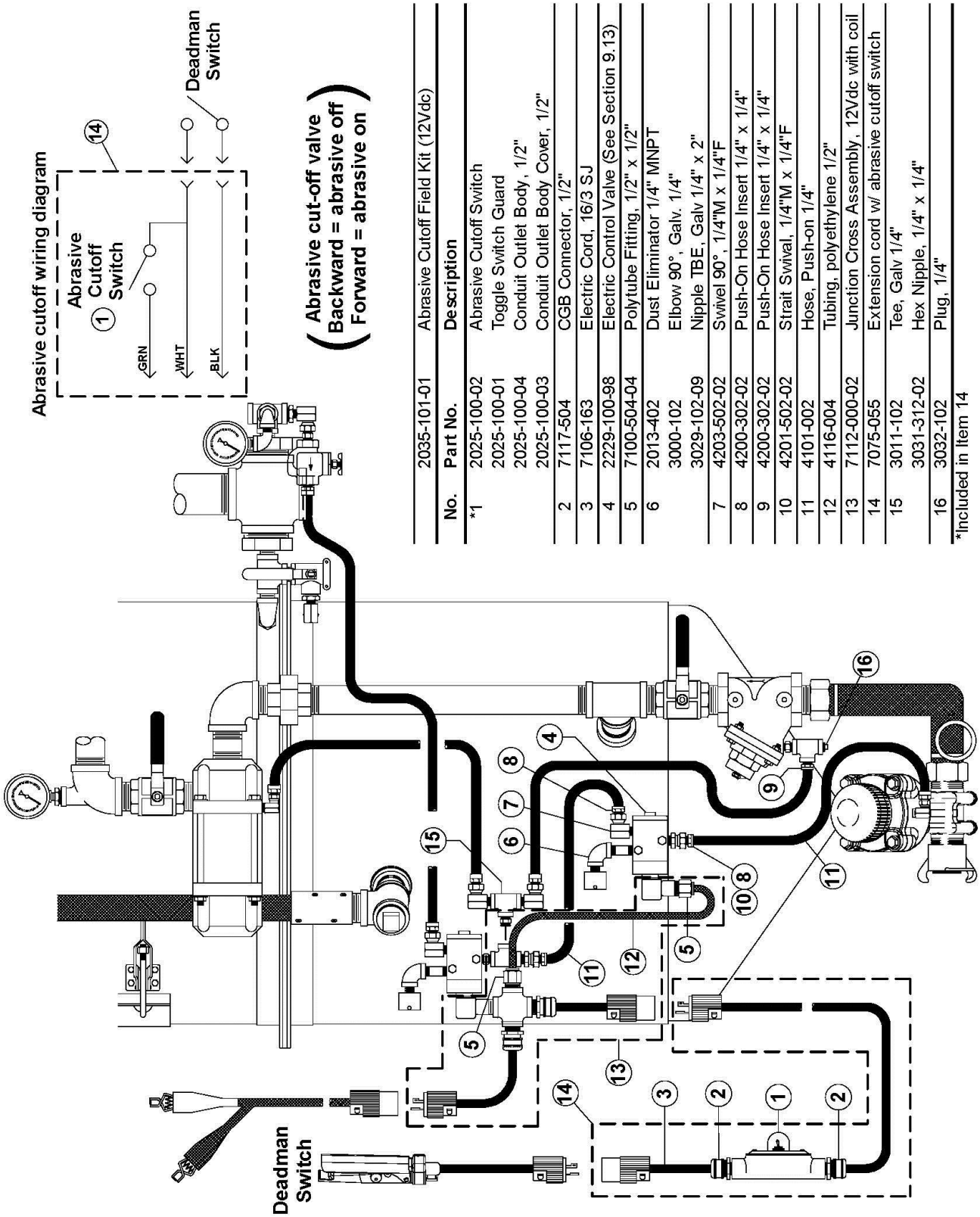
9.4(a) BRS Abrasive Blaster Remote Abrasive Cutoff (Pneumatic)



	2035-001-01	Abrasive Cutoff Field Kit (pneumatic)
No.	**Part No.**	**Description**
1	2025-010	Abrasive Cutoff Valve
	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	Pneumatic Control Valve
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)
16	4101-002	Hose, Push-on 1/4"
*17	4100-501-02	Twinline Hose with abrasive cutoff, 55ft
18	3011-102	Tee, Galv 1/4"
	3031-312-02	Hex Nipple, 1/4" x 1/4"
19	3032-102	Plug, 1/4"

*Not included in field kit

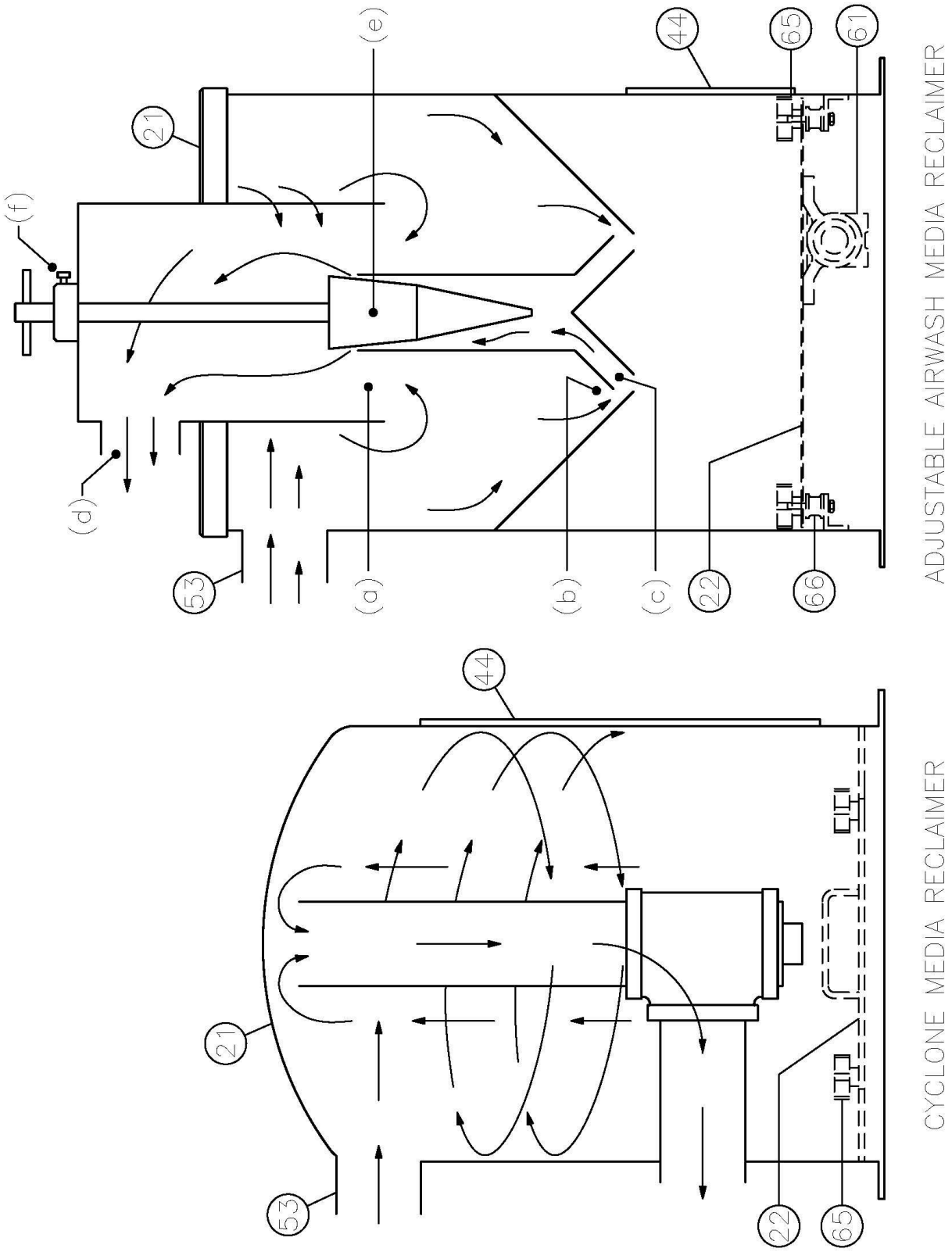
9.4(b) BRS Abrasive Blaster Remote Abrasive Cutoff (Electric)



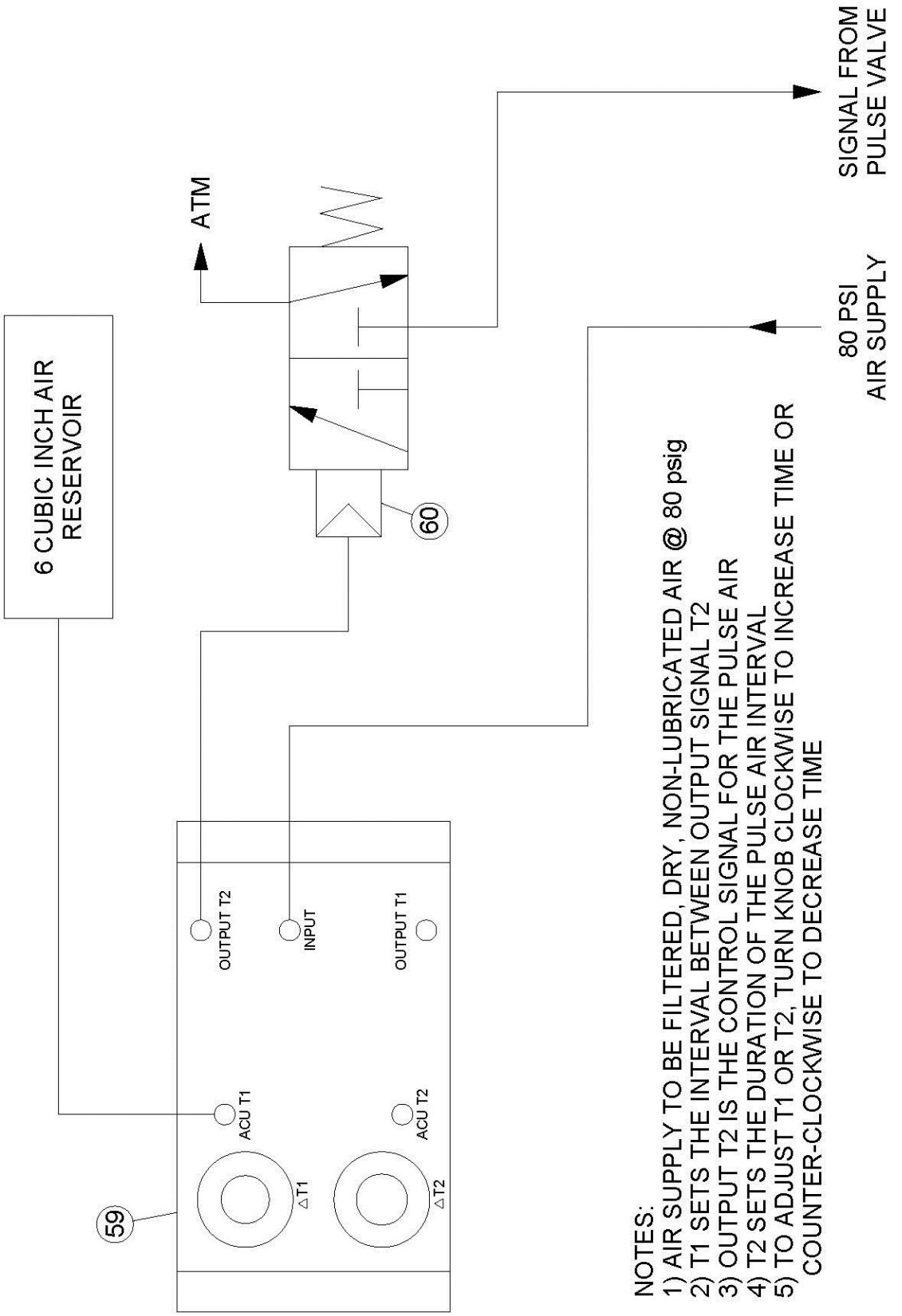
	2035-101-01	Abrasive Cutoff Field Kit (12Vdc)
No.	**Part No.**	**Description**
*1	2025-100-02	Abrasive Cutoff Switch
	2025-100-01	Toggle Switch Guard
	2025-100-04	Conduit Outlet Body, 1/2"
	2025-100-03	Conduit Outlet Body Cover, 1/2"
2	7117-504	CGB Connector, 1/2"
3	7106-163	Electric Cord, 16/3 SJ
4	2229-100-98	Electric Control Valve (See Section 9.13)
5	7100-504-04	Polytube Fitting, 1/2" x 1/2"
6	2013-402	Dust Eliminator 1/4" MNPT
	3000-102	Elbow 90°, Galv. 1/4"
	3029-102-09	Nipple TBE, Galv 1/4" x 2"
7	4203-502-02	Swivel 90°, 1/4"M x 1/4"F
8	4200-302-02	Push-On Hose Insert 1/4" x 1/4"
9	4200-302-02	Push-On Hose Insert 1/4" x 1/4"
10	4201-502-02	Strait Swival, 1/4"M x 1/4"F
11	4101-002	Hose, Push-on 1/4"
12	4116-004	Tubing, polyethylene 1/2"
13	7112-000-02	Junction Cross Assembly, 12Vdc with coil
14	7075-055	Extension cord w/ abrasive cutoff switch
15	3011-102	Tee, Galv 1/4"
	3031-312-02	Hex Nipple, 1/4" x 1/4"
16	3032-102	Plug, 1/4"

*Included in Item 14

9.5 BRS Wash Abrasive Blaster Pneumatic Schematic

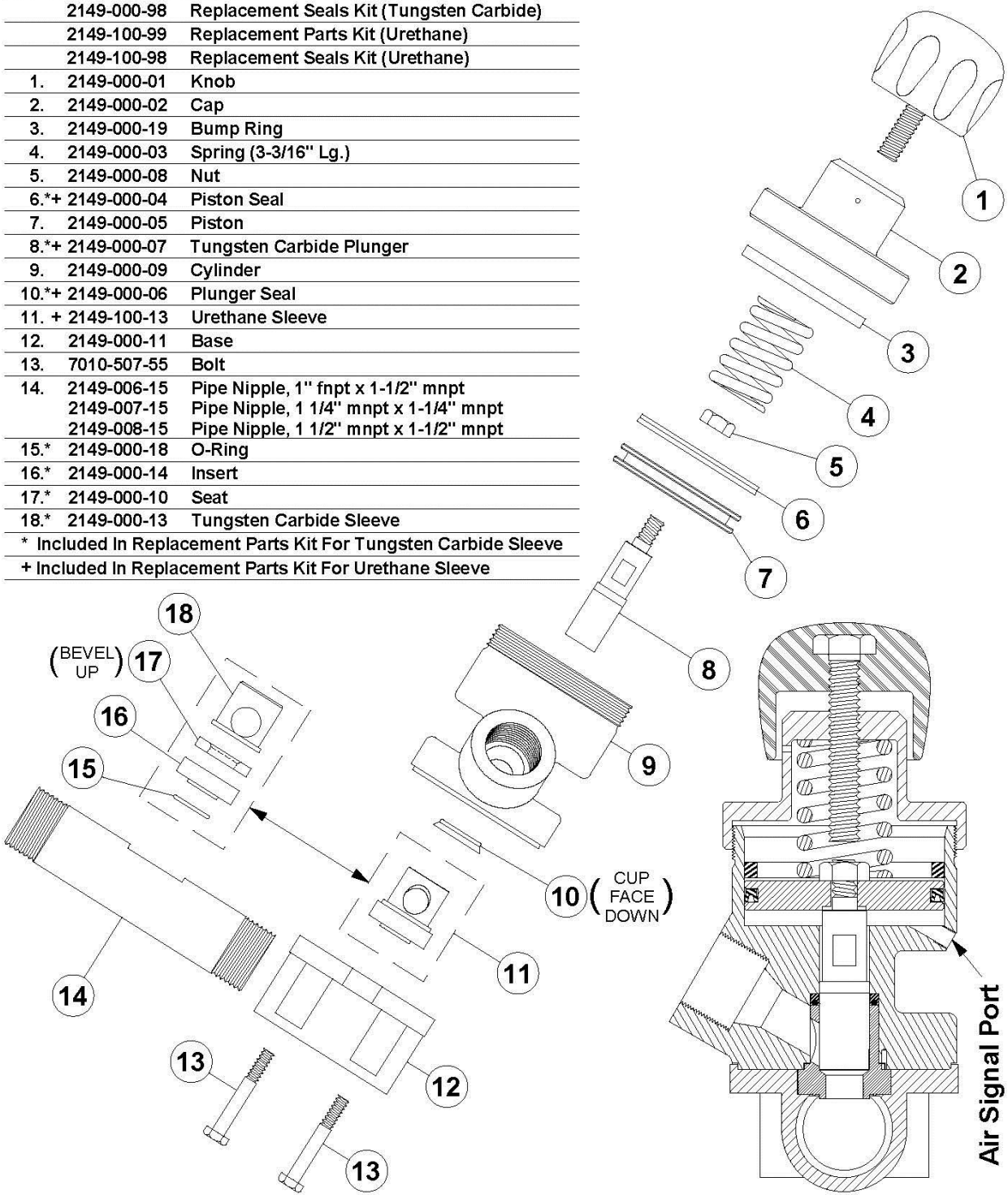


9.6 Automatic Pulse Jet Control Box Schematic



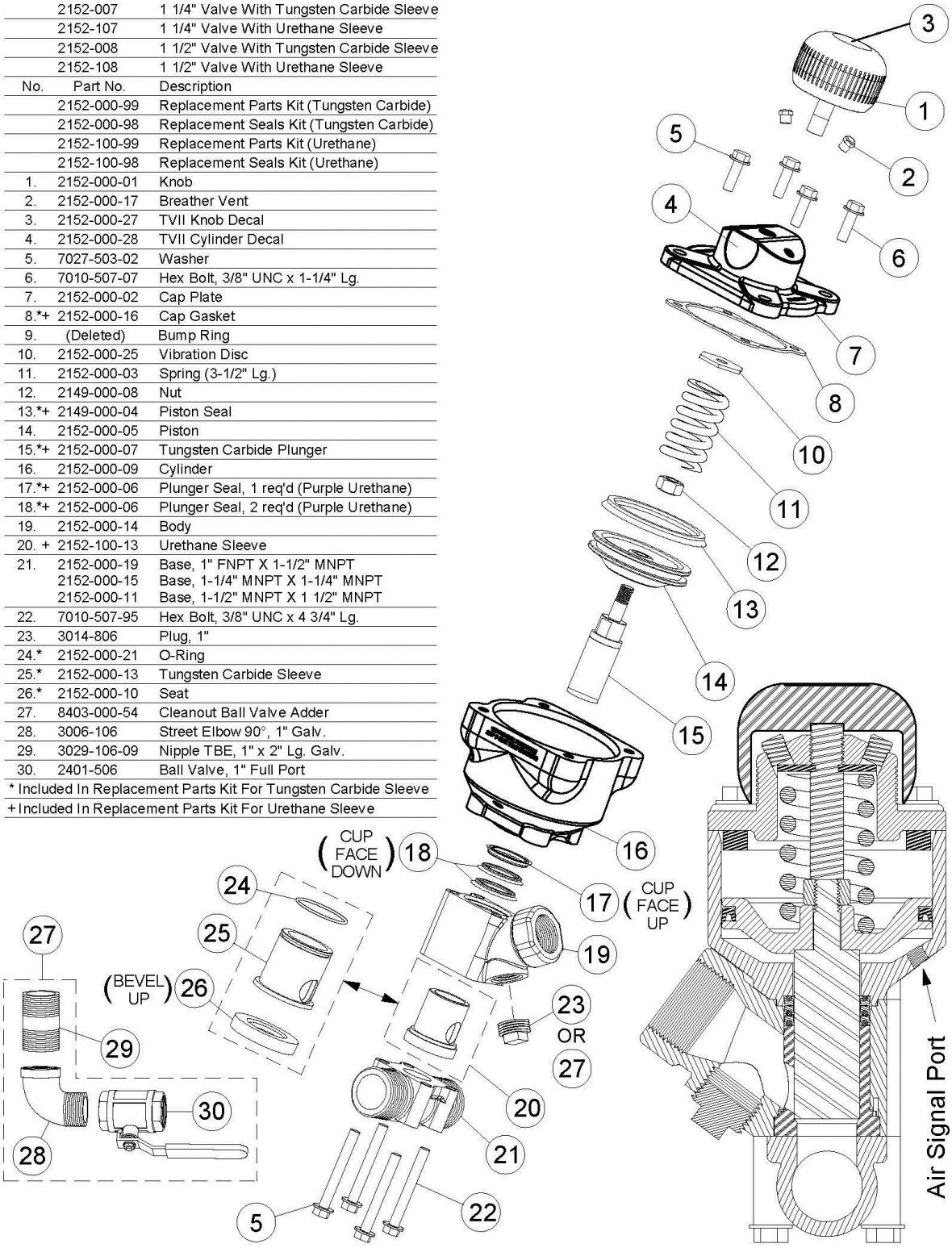
9.7(a) Thompson® Valve

	2149-006	1" Valve With Tungsten Carbide Sleeve
	2149-106	1" Valve With Urethane Sleeve
	2149-007	1 1/4" Valve With Tungsten Carbide Sleeve
	2149-107	1 1/4" Valve With Urethane Sleeve
	2149-008	1 1/2" Valve With Tungsten Carbide Sleeve
	2149-108	1 1/2" Valve With Urethane Sleeve
No.	Part No.	Description
	2149-000-99	Replacement Parts Kit (Tungsten Carbide)
	2149-000-98	Replacement Seals Kit (Tungsten Carbide)
	2149-100-99	Replacement Parts Kit (Urethane)
	2149-100-98	Replacement Seals Kit (Urethane)
1.	2149-000-01	Knob
2.	2149-000-02	Cap
3.	2149-000-19	Bump Ring
4.	2149-000-03	Spring (3-3/16" Lg.)
5.	2149-000-08	Nut
6.*+	2149-000-04	Piston Seal
7.	2149-000-05	Piston
8.*+	2149-000-07	Tungsten Carbide Plunger
9.	2149-000-09	Cylinder
10.*+	2149-000-06	Plunger Seal
11. +	2149-100-13	Urethane Sleeve
12.	2149-000-11	Base
13.	7010-507-55	Bolt
14.	2149-006-15	Pipe Nipple, 1" fnpt x 1-1/2" mnpt
	2149-007-15	Pipe Nipple, 1 1/4" mnpt x 1-1/4" mnpt
	2149-008-15	Pipe Nipple, 1 1/2" mnpt x 1-1/2" mnpt
15.*	2149-000-18	O-Ring
16.*	2149-000-14	Insert
17.*	2149-000-10	Seat
18.*	2149-000-13	Tungsten Carbide Sleeve
* Included In Replacement Parts Kit For Tungsten Carbide Sleeve		
+ Included In Replacement Parts Kit For Urethane Sleeve		



9.7(b) 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.	2152-000-27	TVII Knob Decal
4.	2152-000-28	TVII Cylinder Decal
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 (3-1/2" Lg.)
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	Base, 1" FNPT X 1-1/2" MNPT
	2152-000-15	Base, 1-1/4" MNPT X 1-1/4" MNPT
	2152-000-11	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		



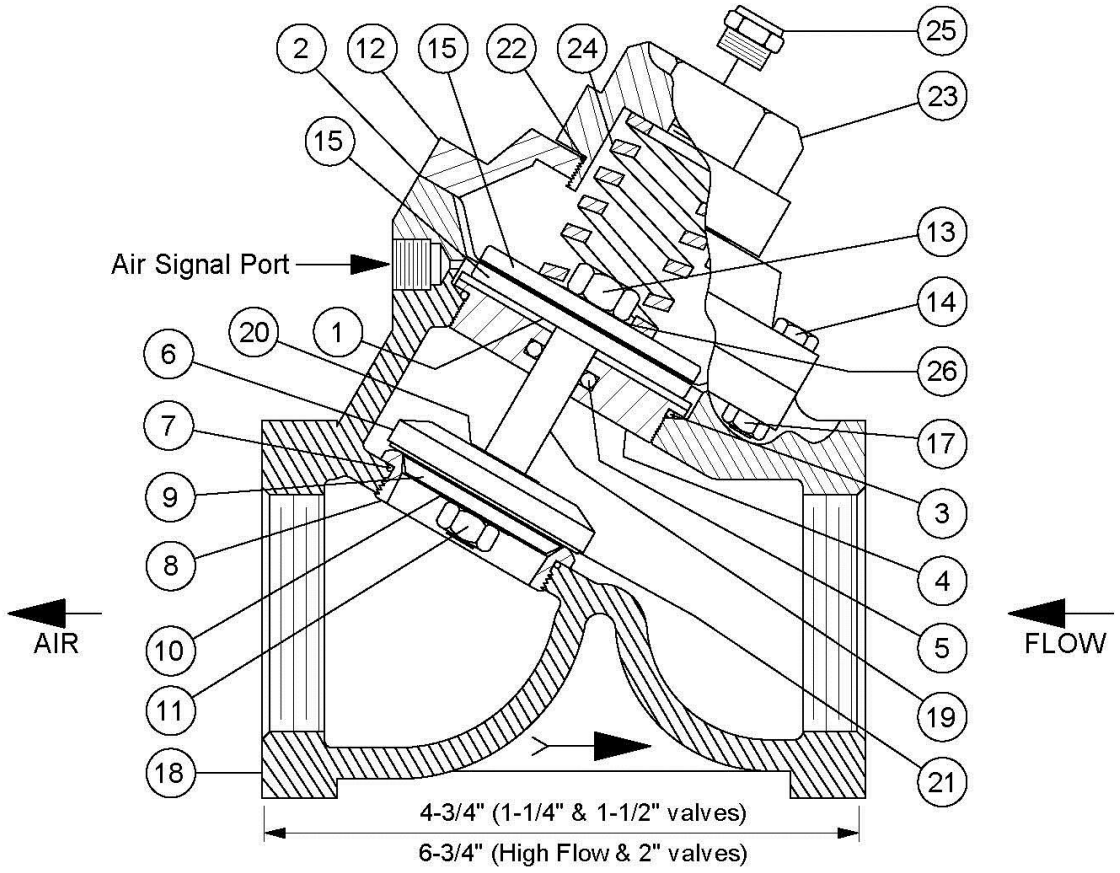
9.8 Automatic Air Valve (normally closed)

	2123-106	1" Valve
No.	Part No.	Description
	2123-006-99	Replacement Parts Kit
1.*	2123-007-20	Gasket
2.*	2123-006-02	Diaphragm
3.*	2123-006-03	O-ring
4.	2123-006-04	Retainer Bushing
5.*	2123-007-05	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.*	7082-504	Lock Nut
12.	2123-106-12	Cap
13.*	2123-006-13	Lock Nut
14.	7010-503-06	Cap Screw
15.	2123-006-15	Diaphragm Plate
17.	7082-503	Lock Nut
18.	2123-006-18	Body, 1"
19.	2123-006-19	Shaft
20.*	2123-007-20	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"
26.*	2123-007-20	Gasket
* 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.*	2123-009-01	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.*	7082-504	Lock Nut
12.	2123-107-12	Cap
13.*	7082-506	Lock Nut
14.	7010-503-07	Cap Screw
15.	2123-007-15	Diaphragm Plate
17.	7082-503	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"
26.*	2123-009-01	Gasket
* Included In Replacement Parts Kit		

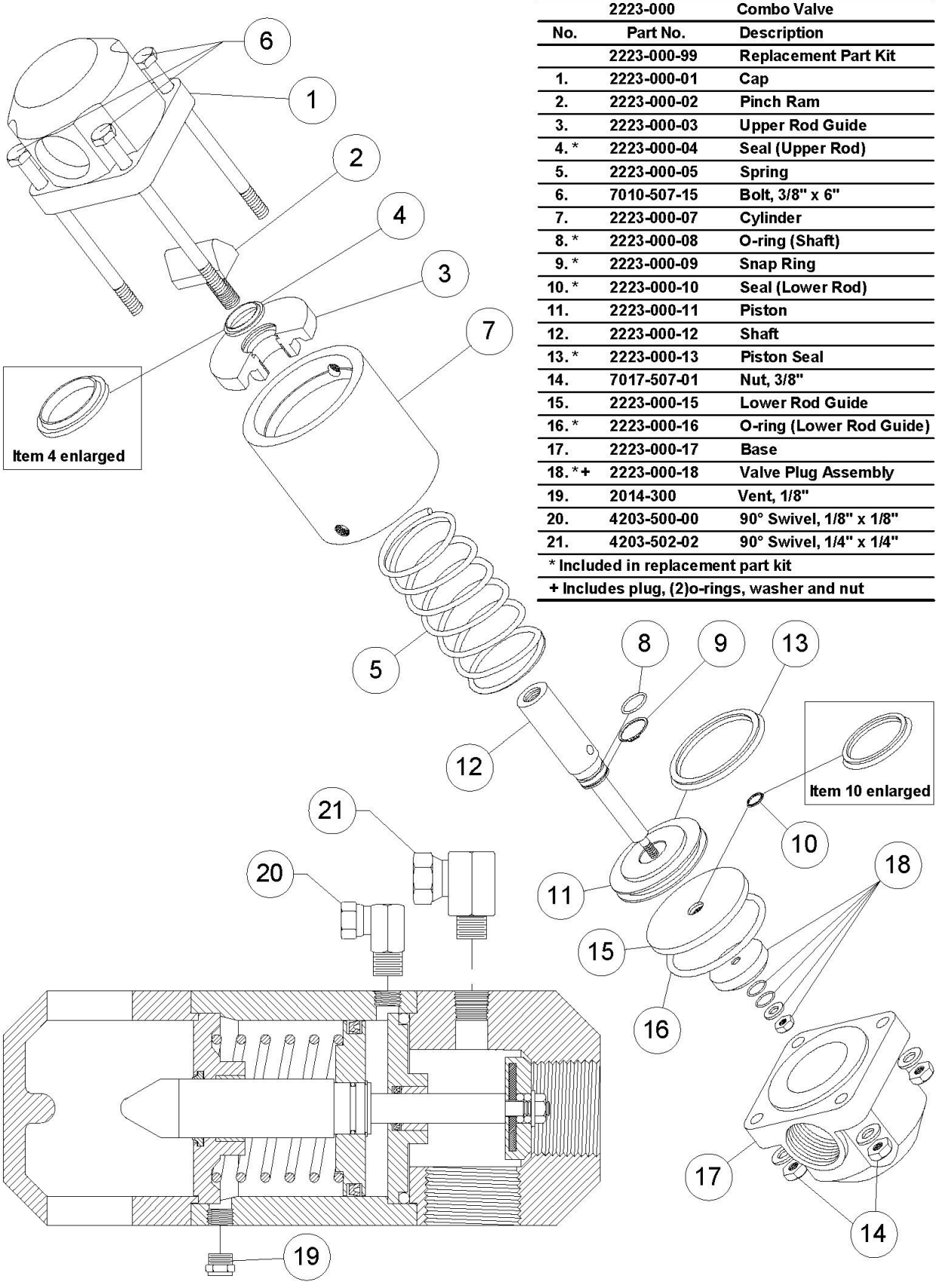
**	2123-108L	1-1/2" High Flow Valve
	2123-109	2" Valve
No.	Part No.	Description
	2123-009-99	Replacement Parts Kit
1.*	2123-009-01	Gasket
2.*	2123-009-02	Diaphragm
3.*	2123-009-03	O-ring
4.	2123-009-04	Retainer Bushing
5.*	2123-009-05	O-ring
6.	2123-009-06	Disk Retainer
7.*	2123-009-07	O-ring
8.	2123-009-08	Seat
9.	2123-007-15	Disc Plate
10.	"Deleted"	Lock Washer, Internal
11.*	7082-506	Lock Nut
12.	2123-109-12	Cap
13.*	7082-506	Lock Nut
14.	7010-505-07	Cap Screw
15.	2123-009-15	Diaphragm Plate
17.	7082-505	Hex Nut
18.	2123-009-27	Body, 1-1/2" high flow
	2123-009-18	Body, 2"
19.	2123-009-19	Shaft
20.*	2123-009-01	Gasket
21.*	2123-009-21	Disc
22.*	2123-107-22	O-ring
23.	2123-109-23	Spring Retainer
24.	2123-109-24	Spring
25.	2014-300	Vent, 1/8"
26.*	2123-009-28	Washer
* Included In Replacement Parts Kit		

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



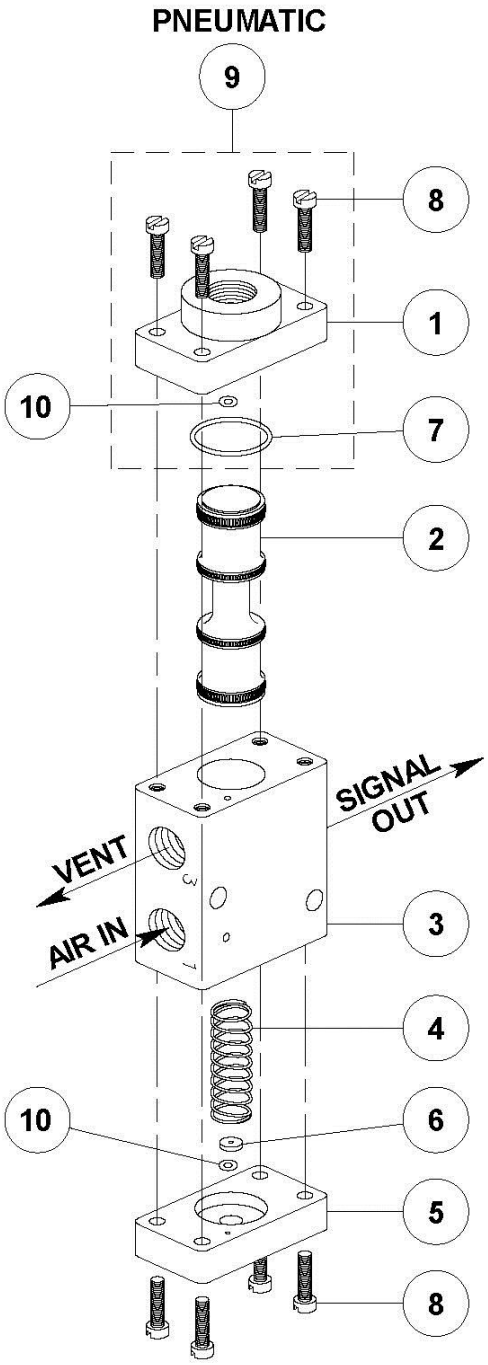
NOTE: With spring closed valve air flow is in opposite direction from arrow on valve body.

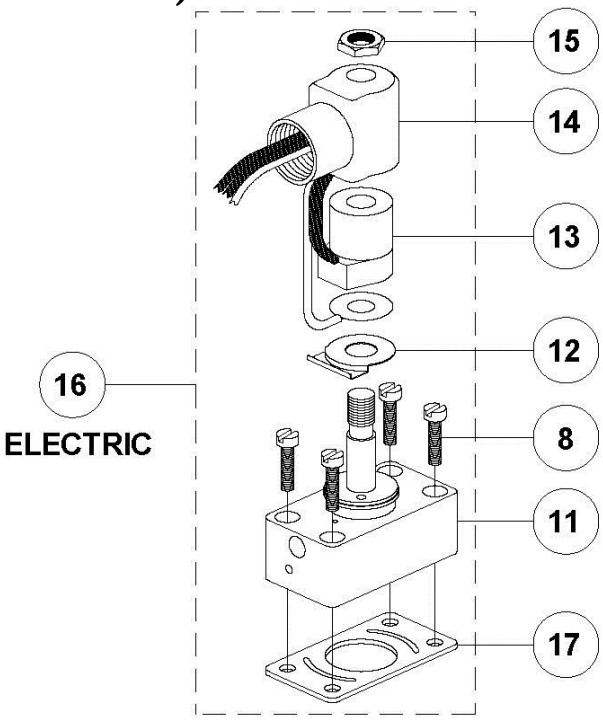
9.9 Combo Valve®



	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		

9.10 Control Valves (pneumatic and electric)

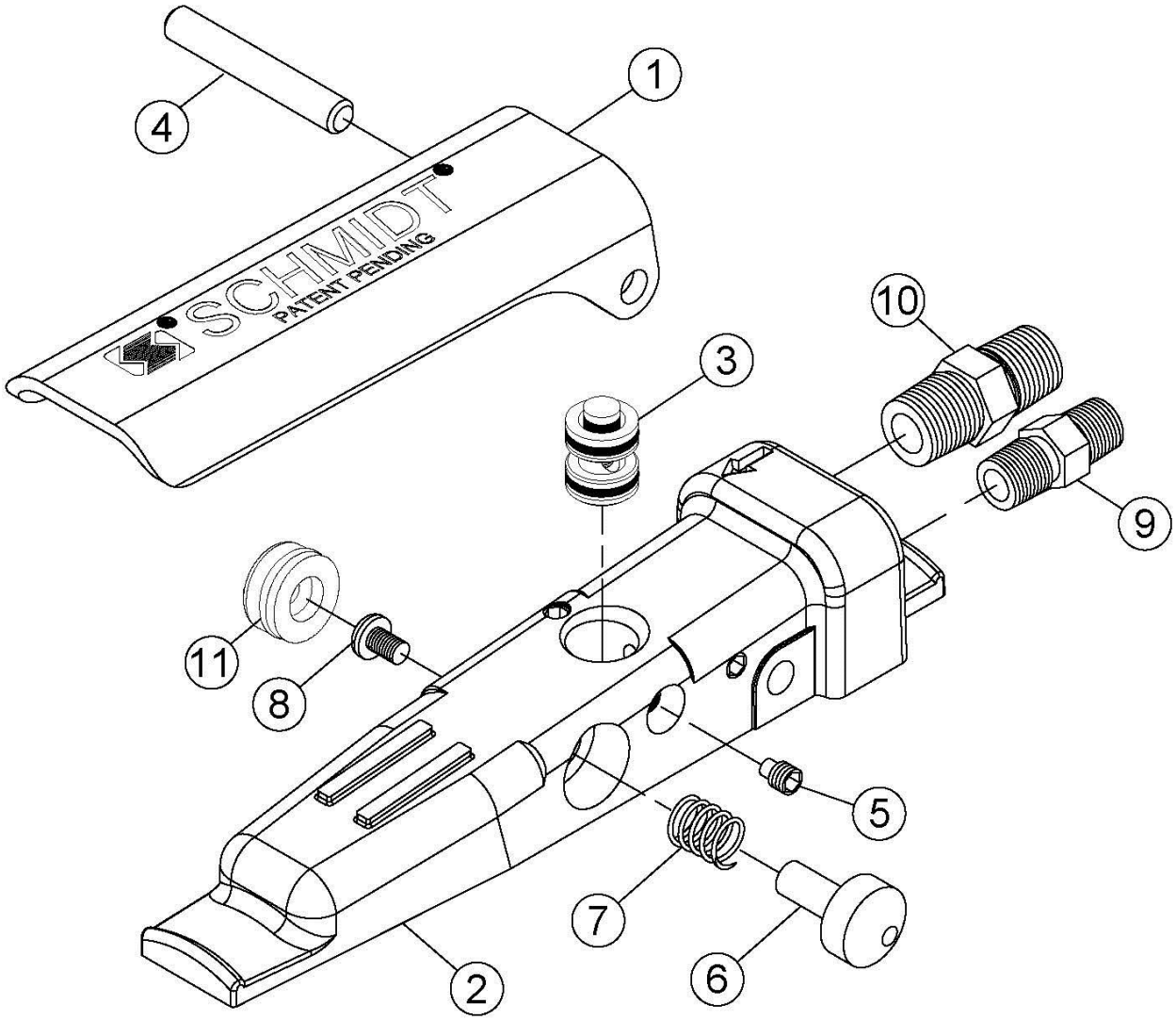




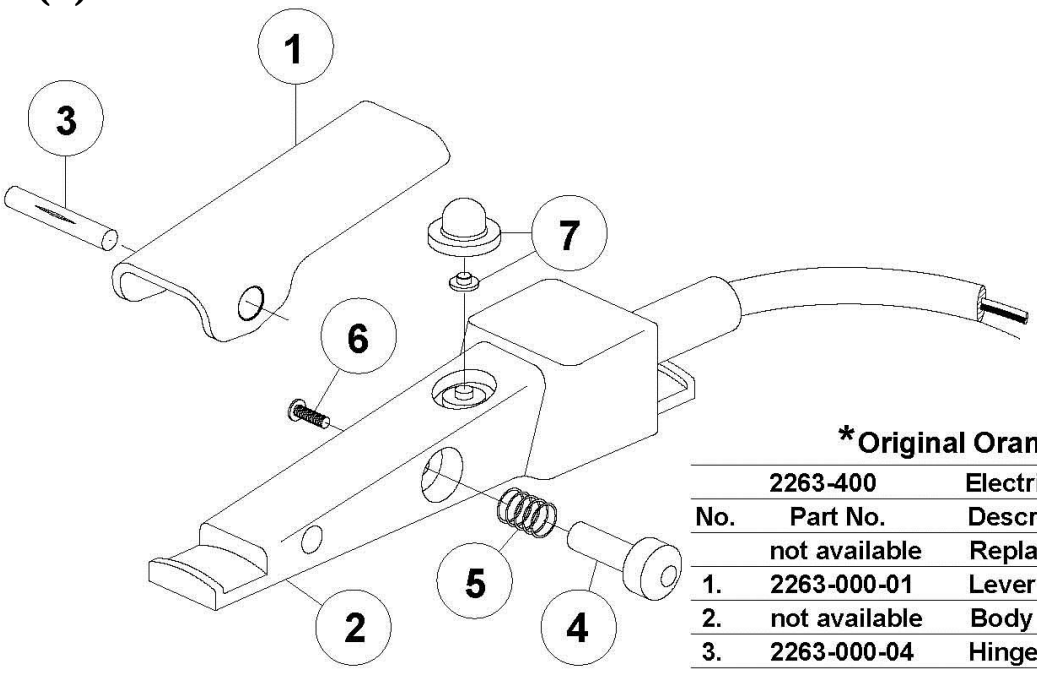
	2229-000	Pneumatic Control Valve
	2229-100	Electric Control Valve, 12 Volt D.C.
	2229-101	Electric Control Valve, 12 Volt A.C.
	2229-102	Electric Control Valve, 24 Volt D.C.
	2229-100	Electric Control Valve, 24 Volt A.C.
	2229-105	Electric Control Valve, 120 Volt A.C.
No.	Part No.	Description
	2229-000-99	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		

9.11(a) G2 Pneumatic Deadman

	2263-002	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		

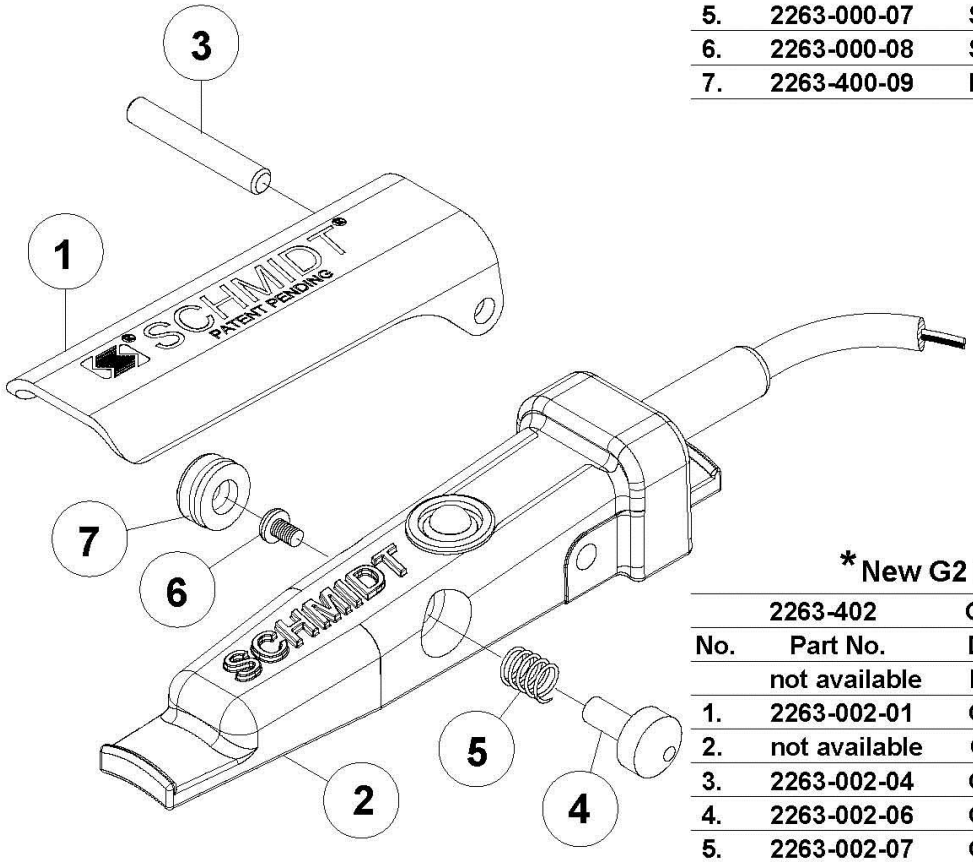


9.11(b) G2 Electric Deadman



*Original Orange

	2263-400	Electric Deadman
No.	Part No.	Description
	not available	Replacement Parts Kit
1.	2263-000-01	Lever
2.	not available	Body w/Molded Switch
3.	2263-000-04	Hinge Pin
4.	2263-000-06	Safety Button
5.	2263-000-07	Spring
6.	2263-000-08	Screw for Button
7.	2263-400-09	Dust Cover w/Insert



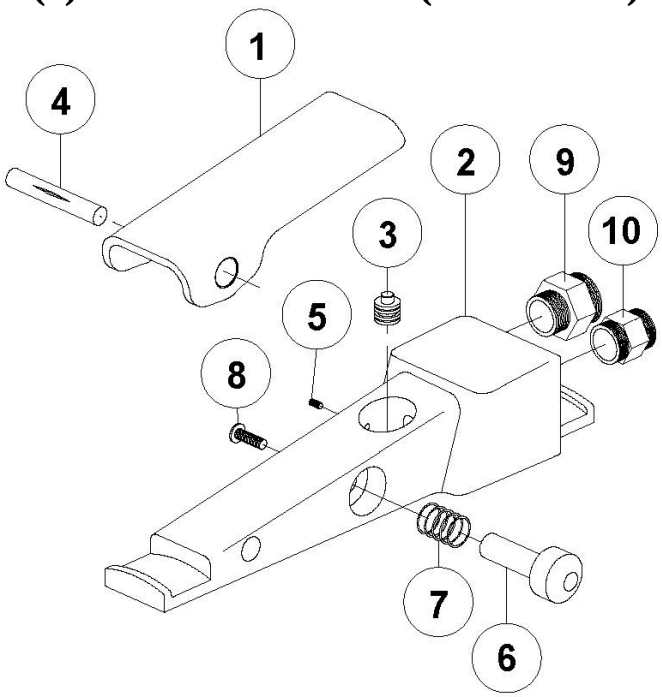
*New G2 Electric

	2263-402	G2 Electric Deadman
No.	Part No.	Description
	not available	Replacement Parts Kit
1.	2263-002-01	G2 Lever
2.	not available	G2 Body w/Switch
3.	2263-002-04	G2 Hinge Pin
4.	2263-002-06	G2 Safety Button
5.	2263-002-07	G2 Spring
6.	2263-000-08	Screw for Button
7.	2263-002-10	G2 Dust Plug

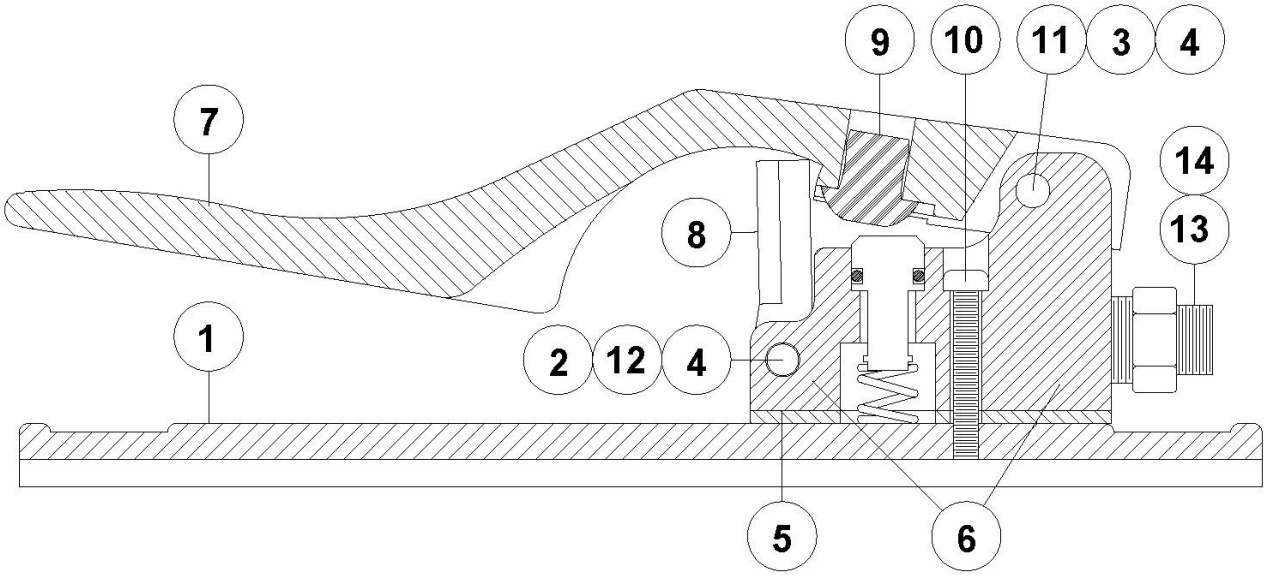
⚠ WARNING

*Electric shock hazard. To minimize shock hazard use electric deadman in low voltage applications only (12-24 volts).

9.11(c) Deadman Valves (Pneumatic)

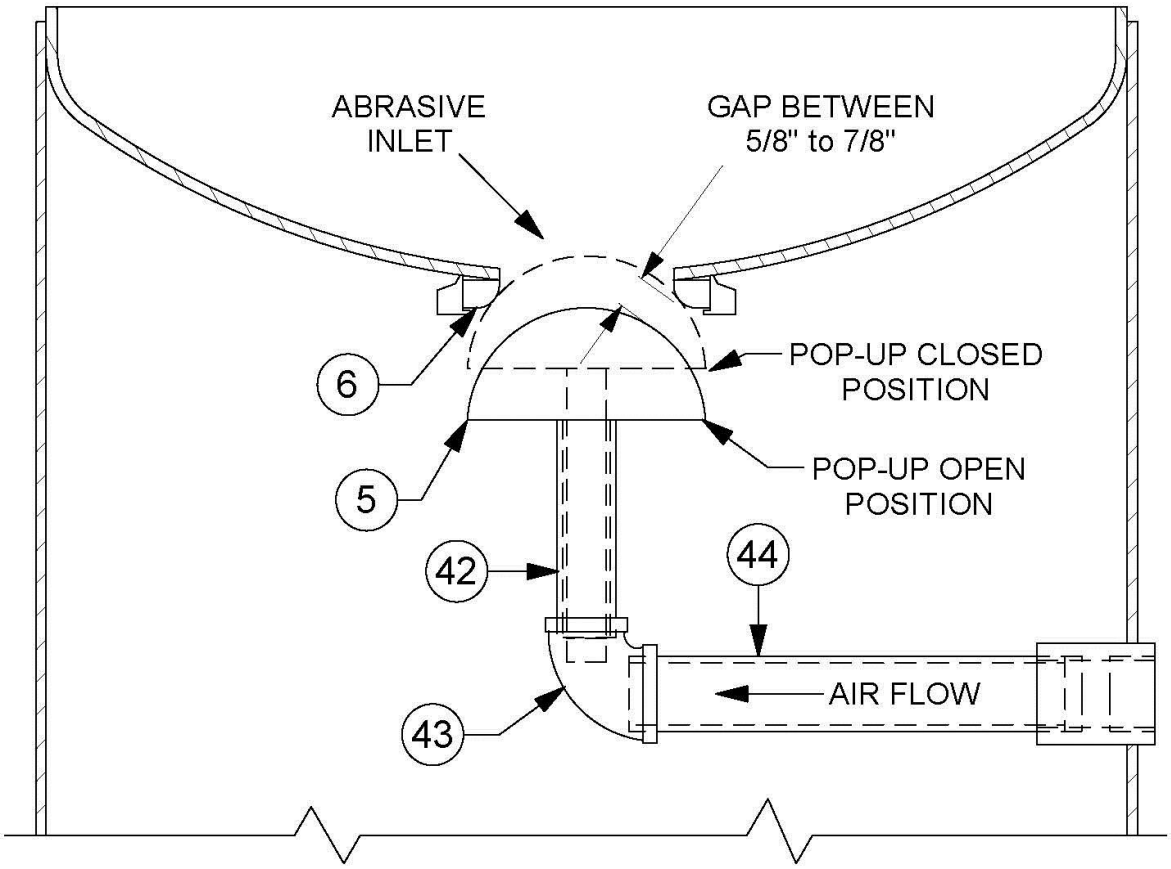


	2263-000	Pneumatic Deadman
No.	Part No.	Description
	2263-000-99	Replacement Parts Kit
1.	2263-000-01	Lever
2.	2263-000-02	Body
*3.	2263-000-03	Cartridge
4.	2263-000-04	Hinge Pin
*5.	2263-000-05	Set Screw
6.	2263-000-06	Safety Button
*7.	2263-000-07	Spring
*8.	2263-000-08	Screw for Button
9.	3031-302-00	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		

9.12 Pop-Up and Internal Piping

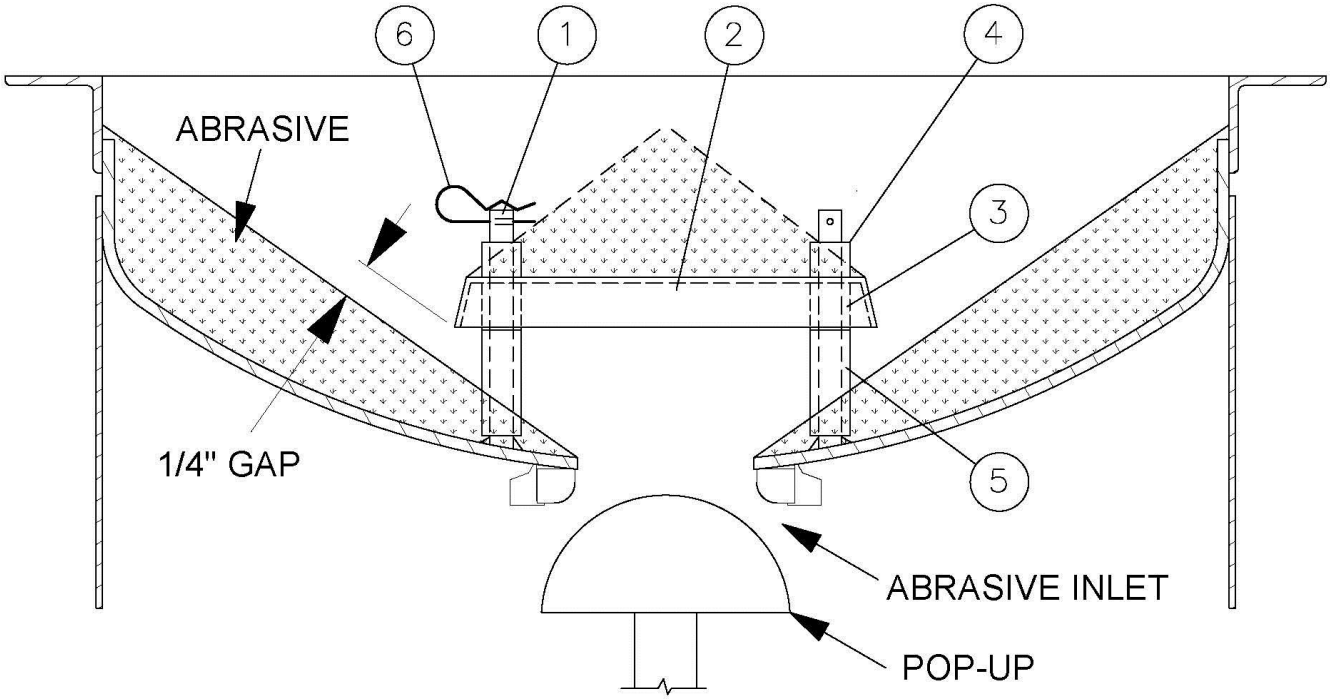


NO.	PART NO.	DESCRIPTION	VESSEL
5.	2100-000	Pop-Up Head, (1 Bag)	(1.5cu.ft.)
	2100-010	Pop-Up Head, (3 & 6 Bag)	(3.5, 6.5, 10, & 20cu.ft.)
	2100-010-04	Pop-Up Head, (3 & 6 Bag) High Flow	(optional for Thompson Valve vessels)
6.	2100-001	Pop-Up Gasket (1 Bag)	(1.5cu.ft.)
	2100-011	Pop-Up Gasket, (3 & 6 Bag)	(3.5, 6.5, 10, & 20cu.ft.)
	2100-011-04	Pop-Up Gasket, (3 & 6 Bag) SureSeal	(optional for Thompson Valve vessels)
*42.	3030-005-11	Nipple TOE, 3/4" x 3" LG	(1.5cu.ft.)
	3030-006-17	Nipple TOE, 1" x 8" LG	(3.5, 6.5, & 20cu.ft.)
	3030-006-86	Nipple TOE, 1" x 7 1/2" LG	(vessels with optional skirted gasket)
	3030-006-23	Nipple TOE, 1" x 13 3/4" LG	(10cu.ft.)
	3030-006-23	Nipple TOE, 1" x 13 1/4" LG	(vessels with optional skirted gasket)
43.	3010-006-05	Red. Elbow 90, 1" x 3/4"	(1.5cu.ft.)
	3010-007-06	Red. Elbow 90, 1 1/4" x 1"	(3.5, 6.5, & 10cu.ft.)
	3010-008-06	Red. Elbow 90, 1 1/2" x 1"	(20cu.ft.)
44.	3029-006-14	NIPPLE TBE, 1" x 5" LG	(1.5cu.ft.)
	3029-007-28	NIPPLE TBE, 1 1/4" x 7 1/2" LG	(3.5cu.ft.)
	3029-007-19	NIPPLE TBE, 1 1/4" x 10 1/4" LG	(6.5 & 10cu.ft.)
	3029-008-25	NIPPLE TBE, 1 1/2" x 16" LG	(20cu.ft.)

*It may be necessary to cut to length to obtain the proper pop-up gap as shown above.

9.13 Abrasive Spider Adjustment

ITEM	QTY	PART NO.	DESCRIPTION
		7001-004-18	SPIDER, DROP-IN 18" (3.5cf)
		7001-004-24	SPIDER, DROP-IN 24" (6.5cf / 10cf)
		7001-004-36	SPIDER, DROP-IN 36" (20cf)
1	1	7001-000-98	SPIDER STUDS INSTALLED
2	1	7001-000-02	SPIDER DISK 9"
3	3	7001-000-03	SPIDER SPACER, 1"
4	3	7001-000-04	SPIDER SPACER, 3/4"
5	3	7001-000-05	SPIDER SPACER, 2-1/4"
6	3	7119-002	SAFETY PINS, AIR BLAST HOSE COUPLINGS

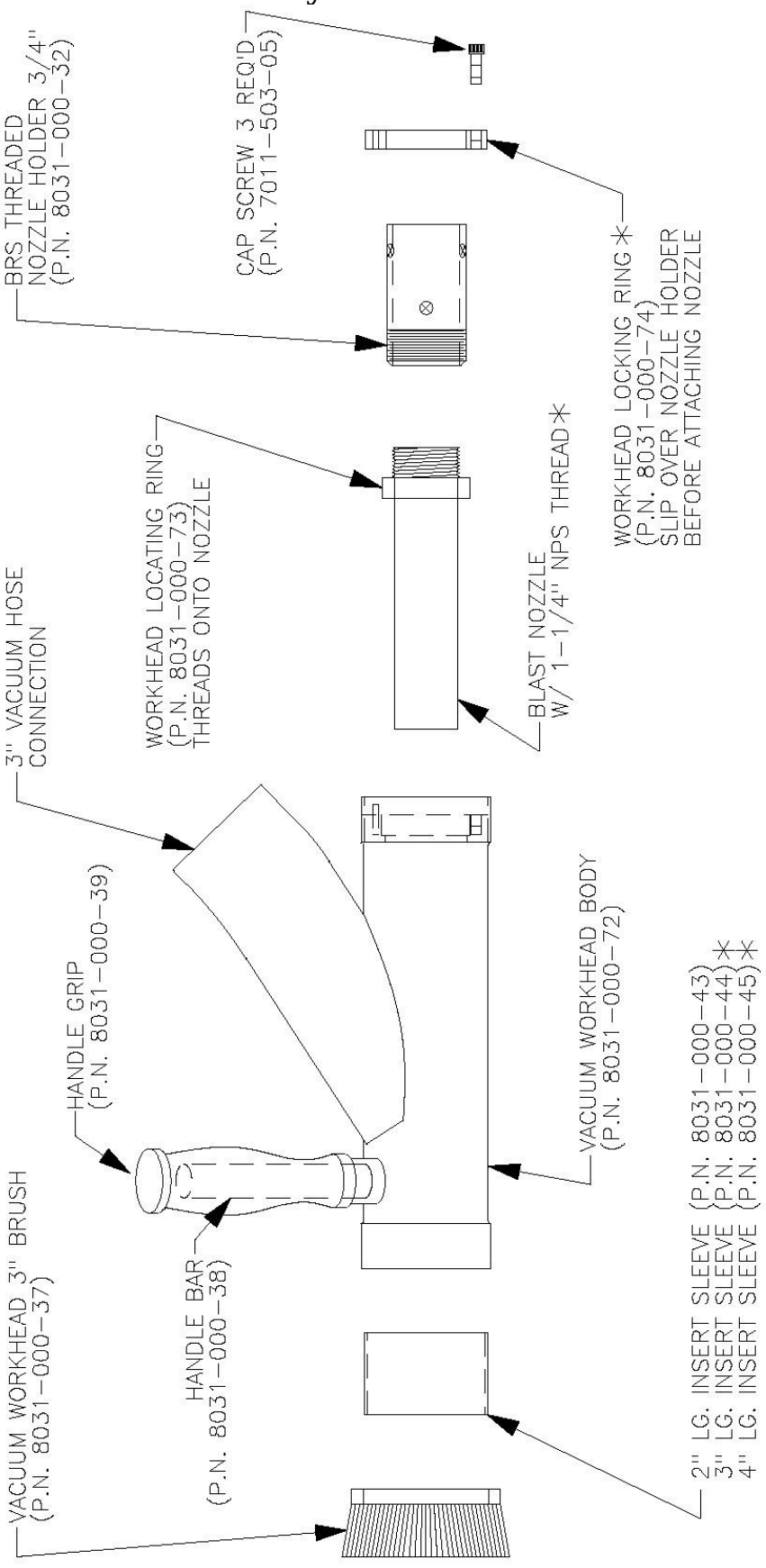


The abrasive spider is a device that is mounted in the top head of the abrasive blaster. The spider is added to blasters that will be installed below an abrasive storage hopper. The spider creates a void area above the blaster abrasive inlet keeping the abrasive from sitting on top of the popup. Abrasive piled on top of the popup restricts movement and can prevent the popup from properly sealing. A leaking popup will cause abrasive flow problems and wear to the popup and popup gasket. Pour abrasive into the vessel top head and allow it to flow in and form the areas of dead abrasive above the spider plate and to the sides as shown above. The gap should be approximately 1/4". The spider spacers can be removed to lower the spider disk. The spacers can be cut shorter if necessary.

⚠ WARNING

Pinch point hazard. Vessel pressurization will close the popup. Keep hands and fingers away from popup. Disconnect air supply prior to performing popup maintenance.

9.14 Vacuum Head Assembly



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

10.0 Recommended Spare Parts List

ITEM	QTY	PART #	DESCRIPTION
1	1	2401-509	2" Ball valve
3,37,68	1	2401-502	1/4" Ball valve
5	1	2223-000	Combo Valve
5	1	2223-000-99	Combo Valve replacement parts kit
5	1	2223-000-18	Combo Valve plug assembly
6	1	4115-005-03	Blowdown hose, 3/4" x 3 ft
7,9,11	1	2401-507	1-1/4" Ball valve
10	1	2003-007-99	1-1/4" Regulator replacement parts kit
12	1	2152-000-03	Thompson Valve® II spring
12	1	2152-000-09	Thompson Valve II cylinder
12	1	2152-000-11	Thompson Valve II base
12	1	2152-XXX-99	Thompson Valve II replacement parts kit (specify urethane or carbide)
12	1	2152-XXX	1 1/4" Thompson Valve II (specify urethane or carbide sleeve)
13	1	2263-402	G2 pneumatic deadman valve
14	1	2013-402	Dust eliminator, ¼"
15,60	1	2229-000	Pneumatic control valve (See Section 9.8)
15,60	2	2229-000-99	Pneumatic control valve replacement parts kit
16	10	4211-999	Gasket, 4-lug crowfoot
17	1	2401-508	1 1/2" Ball valve
24	1	2100-010	Popup with stem
25	1	2100-011	Popup gasket
32	1	8408-000-58	BRS dry filter w/clamping plate, 12" paper element
36	1	2123-106	Pulse valve, 1"
38	1	2302-102-99	1/4" Air filter replacement parts kit
39	1	2001-010	1/4" Regulator non-adjustable
43	1	7000-001-11	Handway crab assembly, 6" x 8"
43	1	7000-001-06	Handway gasket, 6" x 8"
44	1	8031-000-31	BRS 3.5/6.5 reclaimer door gasket
45	1	8031-000-04	BRS dust collector HEPA filter door gasket
51	2	5000-XXX	Blast nozzle (specify size and type)
52	1	8031-000-03	BRS dust collector cartridge filter door gasket
54	1	4104-40X-XX	Blast hose assembly (specify size)
57	2	4224-300-02	Male quick connect, 1/4"
57	2	4224-301-02	Female quick connect, 1/4"
58	1	2123-007-02	1 1/4" Auto Air Valve diaphragm
58	1	2123-107-24	1 1/4" Auto Air Valve spring
58	1	2123-007-99	1 1/4" Auto Air Valve replacement parts kit
58	1	2123-107	1 1/4" Auto Air Valve
58	1	2014-300	Breather vent, 1/8"
59	1	8031-000-18	BRS pulse air pneumatic oscillator
62	1	4100-501	Twinline hose assembly, 55 ft.
64	10	4205-106-99	1" Insert gasket
70	20	7119-002	Safety pin, air/blast hose coupling
N/A	1	7031-999-08	Decal Kit (see Section 0.0)

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 BRS 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® (#12).
(2) Defective valve plunger in Thompson Valve (#12).
(3) Defective sleeve in Thompson Valve (#12).
(4) Blocked air hose to Thompson Valve (#12).
(5) Defective spring in Thompson Valve (#12) (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 (#58).
(2) Defective seat in automatic air valve (#58).
(3) Blocked air hose to automatic air valve (#58).
(4) Defective O-ring in automatic air valve (#58) (around shaft).

11.1.3. Both blast air and abrasive will not shut off

(1) Control lines to deadman valve (#13) are crossed.
(2) Non-Schmidt deadman (#13) has been installed.
(3) Control valve (#15) stuck in the "ON" position.
(4) Blocked control lines.
(5) Defective deadman valve (#13). 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 (#13) is worn out.
(2) The safety button on the deadman is missing. See drawings in Section 9.11.
(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.

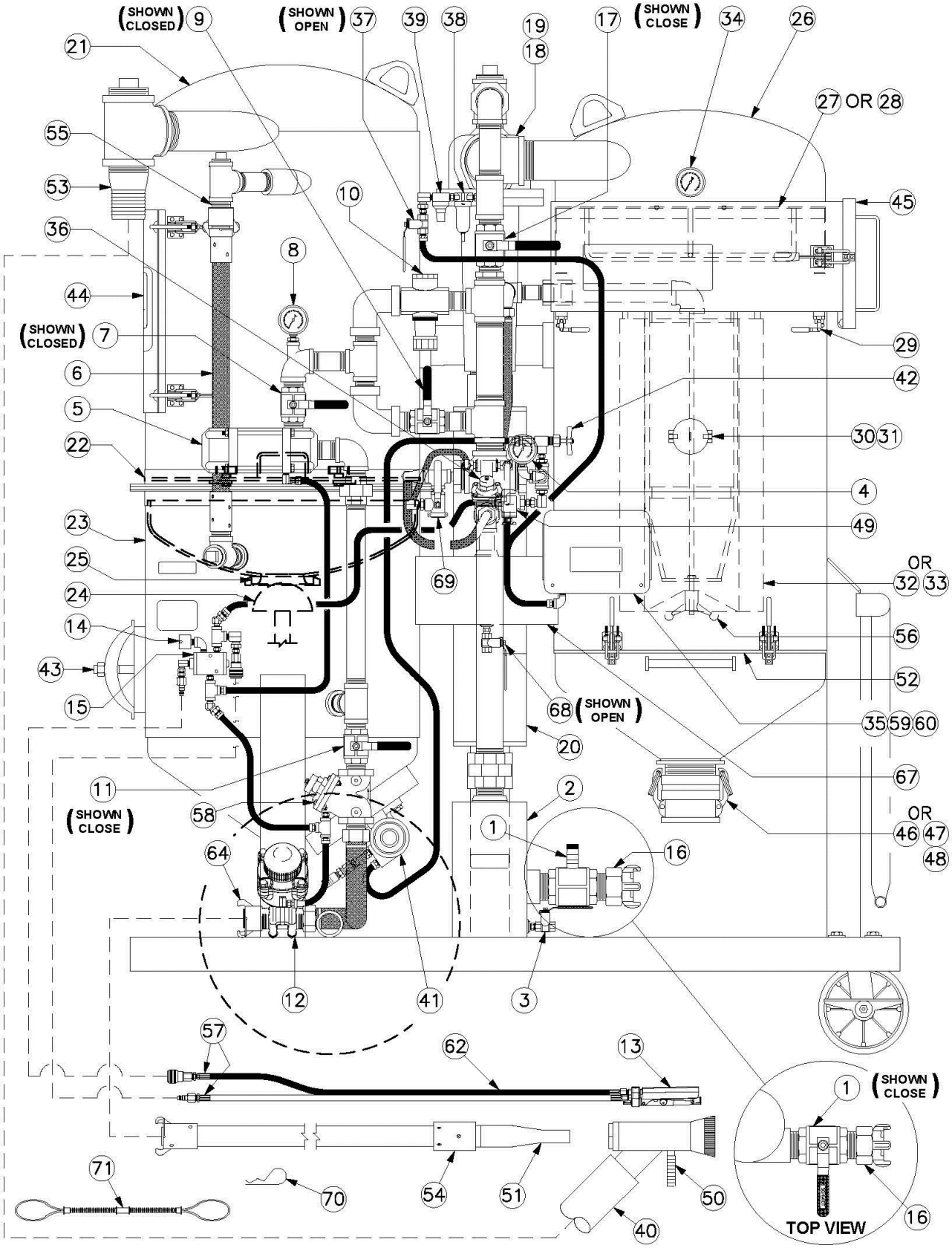


Figure 11.1 – Typical BRS Abrasive Blaster

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.
(2) Blocked control hose to Thompson Valve® (#12).
(3) Thompson Valve plunger stuck in closed position.
(4) Trash plugging opening from tank to Thompson Valve (#12). 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 cause 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 (#12) is open too far.
(2) Control hose to automatic air valve (#58) 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 (#58).

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 (#12) 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 (#51).
(7) Blocked automatic air valve breather vent (#58).

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

(1) Check quick couplings (#57) on control hoses to see if they are connected properly.
(2) Control valve (#15) stuck in exhaust position.
(3) 1/4" strainer (#49) blocked.
(4) Control hoses blocked.
(5) Cartridge in deadman valve (#13) 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 (#13) to control valve (#15).
(8) Trash blocking nozzle orifice.
(9) Blocked automatic air valve breather vent (#58).

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 manually close the choke valve (#11) and the media shut-off union end ball valve (if so equipped) to stop blast flow. 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 (#13) 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 (#51). To protect against 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 to the on-position for the choke procedure.

Note: The Thompson Valve II has a cleanout port to use for this procedure. See the Thompson Valve II drawing in Section 9.7(b) (Item 12).

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

Schmidt, the Schmidt S logo, Thompson Valve, and ComboValve are registered trademarks owned by Axxiom Manufacturing, Inc. Use of the Schmidt, the Schmidt S logo, Thompson Valve, and Combo Valve trademarks without the written consent of Axxiom Manufacturing is strictly prohibited.

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.