MiniBRS™ BLAST AND RECOVERY SYSTEM
OPERATION AND MAINTENANCE MANUAL
MAY 2020

SCHMIDT®

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

Manual Part Number 7200-8033-031-14

AXXIOM MANUFACTURING, INC.™
engineered abrasive systems

SCHMIDT®

Website

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Manual

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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.**

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Instructions for use of manual sections

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

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

⚠ DANGER 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.

⚠ WARNING BLACK LETTERS with ORANGE BACKGROUND

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

⚠ CAUTION 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.

NOTICE WHITE LETTERS with BLUE BACKGROUND

NOTICE: Indicates that equipment could malfunction or potentially become damaged if certain instructions are not followed.

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

Term	Definition
Pressure Vessel	A fabricated tank (or reservoir) that is part of the abrasive blaster which is filled with compressed air and abrasive. (Also referred to as “blast vessel” or “vessel”.)
Pressurize	To manually or automatically fill the abrasive blast vessel with compressed air.
Depressurize	To manually or automatically release all the compressed air from inside the abrasive blast vessel. (Also referred to as “blowdown”.)
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 Decal Identification and Location

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

No.	Qty.	Part no.	Description	Hazard
1.	1	7031-002	Small “Schmidt”	Not Applicable
2.	1	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.
3.	1	7031-007B	“Danger” Pressurized vessel.	Propelled objects will cause serious injury or death. Depressurize vessel prior to performing any maintenance. See Section 6.2.
4.	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.
5.	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.
6.	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.
7.	1	7031-084	“Warning” Decal General hazard and advisory notes.	General list of required actions to take before and during the operation of this equipment. See Section 1.0.
8.	2	7031-111	“Warning” Pinch point hazard.	Removal of dust bin filled with abrasive can pinch and crush hands or fingers. See Section 5.20.
9.	1	7031-008	“Warning” Proper Grounding	For safety, this unit must be properly grounded. Refer to operations manual for procedure. See Section 1.21 and 5.17.

1) 7031-002

2) 7031-054

Figure 0.1(a) – Warning decal summary

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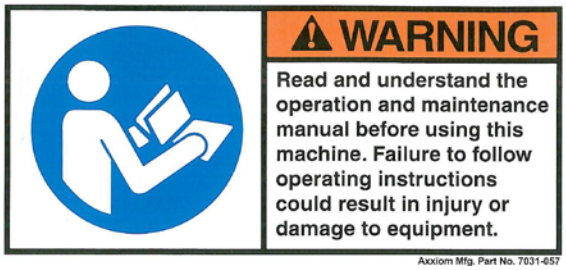
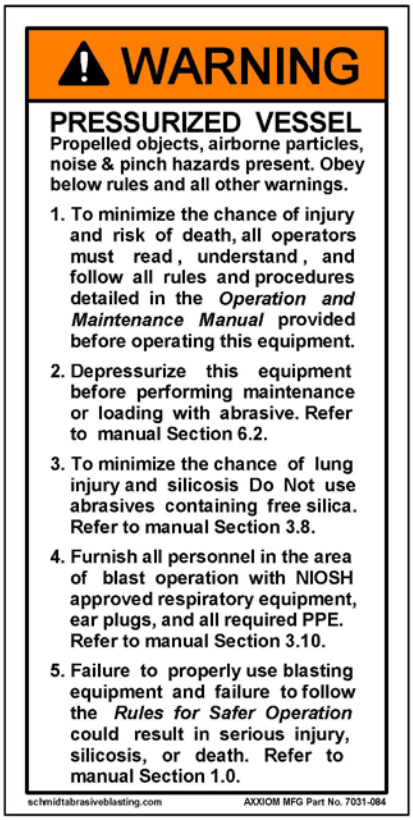
3) 7031-007B



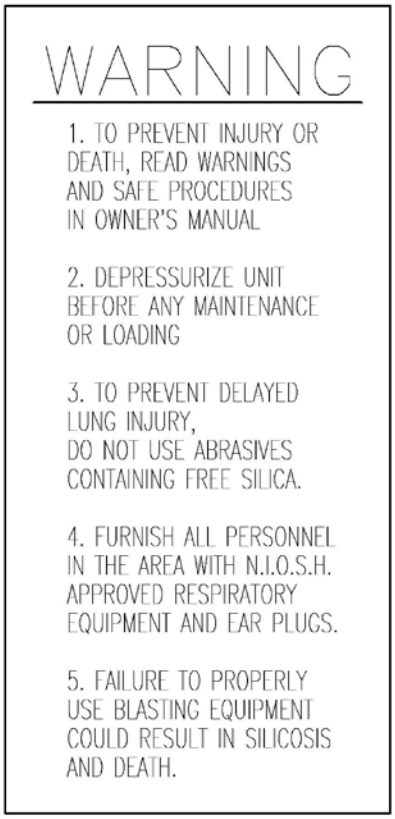
4) 7031-057

5) 7031-077

6) 7031-082



7) 7031-084 (decal)



7a) 7031-084 (welded)
(on units manufactured prior to 2018)

Figure 0.1(b) – Warning decal summary (continued)

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8) 7031-111

9) 7031-008

Figure 0.1(C) – Warning decal summary (continued)

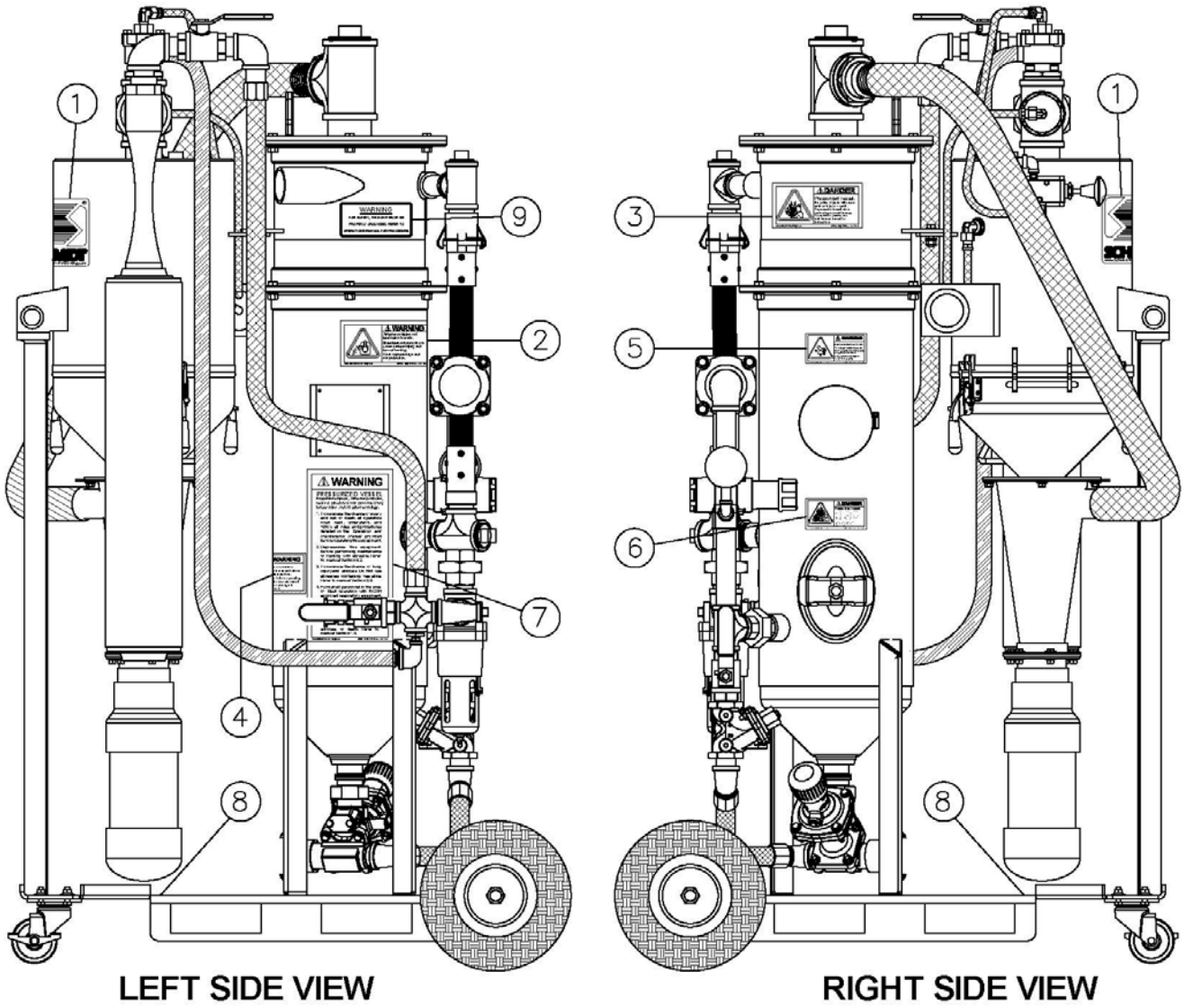

Figure 0.2(a) – Warning decal placement

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1.0 Rules for Safer Operation

1.1. GENERAL RULE FOR SAFER OPERATION.

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

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

⚠ DANGER

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

1.2. KNOW YOUR EQUIPMENT.

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

1.3. RECEIVE PROPER TRAINING.

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

1.4. PROTECT YOUR FEET.

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

⚠ CAUTION

Heavy objects can shift while being blasted and may fall on operators. 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.

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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, 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 and 1910.94.

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 and 1926.101.

Loud noise is generated 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 and 1926.101.

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 1910.132.

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 lose 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.

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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. AVOID DANGEROUS ENVIORNMENTS
It has been determined that blast abrasives approved for use in blast equipment are not ignitable nor do they present a dust explosion hazard in environments approved for use. However, airborne substances that make up the items and substrates being blasted can be ignitable when mixed with airborne dust from the blast abrasive. To mitigate risk of dust explosion avoid blasting in confined spaces without proper ventilation. Consult plant authorities, OSHA 29 CFR 1910.146 and 1910.94.

⚠ DANGER
Explosion Hazard. Do Not operate blast equipment in confined spaces without proper ventilation. Consult plant authorities, OSHA 29 CFR 1910.146 and 1910.94.

1.21. ELECTRICALLY GROUND EQUIPMENT.
Static electricity is generated by the abrasive flow through the blast hose and/or vacuum hose. To minimize chance of static electrical shock to operating personnel only use anti-static blast hose and/or vacuum hose, properly electrically bond the blast nozzle, blast hose couplings, and the equipment, and properly install an earth ground to the abrasive blaster. See Section 5.12.

1.22. 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 1.23 through 1.33 below.

⚠ DANGER
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.

1.23. 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.

1.24. 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. See Section 3.11 for information regarding the pressure relief valve.

1.25. 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.

1.26. ASME NAMEPLATE REQUIRED.

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

1.27. 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.

1.28. 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.

1.29. 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.

1.30. 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.

1.31. 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.

1.32. INSPECT HANDWAY ASSEMBLY.

Do Not operate the abrasive blaster without first inspecting the handway assembly. To ensure proper operation all handway components must be the correct size for the vessel handway opening. See Section 6.4.

1.33. 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. See Section 5.3 and Section 6.2.

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1.34. DEPRESSURIZE VESSEL BEFORE PERFORMING MAINTENANCE.

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

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

1.35. 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).

1.36. 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.

1.37. 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.

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

1.38. 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 5.15 and 8.7.

1.39. 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. See Section 9.0 and Section 12.2.12.

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.

1.40. 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.

1.41. 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.

1.42. 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.

1.43. 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.

1.44. 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.

1.45. DO NOT OVERLOAD THE LIFT EYES.

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

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 8.13.

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. This operation and maintenance manual is available for downloading from SchmidtAbrasiveBlasting.com.

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.

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2.0 Specifications and General Information

2.1 Notes to Distributors and Owners

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

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

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

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

2.1.5. For further information contact:

Axxiom Manufacturing, Inc.
11927 South Highway 6
Fresno, Texas 77545
Phone: 1-800-231-2085
Fax: 1-281-431-1717
Website: www.schmidtabrasiveblasting.com

2.1.6 We have inserted URL of instructional videos to supplement the information within this manual. **Videos do not take the place of the manual, read and understand manual before operating equipment**. This function requires a computer with an internet connection. (For a complete list of instructional videos see Section 10.2)

2.2 MiniBRS™ Abrasive Blaster Operational Specifications

Maximum Working Pressure	125 psig @ 250°F (see ASME nameplate)
Minimum Metal Temperature	-20°F @ 125 psig (see ASME nameplate)
Air Consumption	See Section 13 table 1
Abrasive Consumption	See Section 13 table 2
Blast Hose Size	See Section 13 table 3 (This unit is supplied with ½ hose)
Electrical requirements	See Section 3.7 (If applicable)
Abrasive Capacity	Blast vessel: 0.46 cu ft Reclaim hopper: 0.46 cu ft
Vacuum System	Pneumatic Vacuum Eductor: 75 SCFM @ 100psig
Weight	360 lbs. (empty) Excluding blast and vacuum hoses 439 lbs. (empty) Including hoses and shipping pallet
Dimensions	64” H x 25” W x 38” L

2.3 Important Reference Numbers

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

Blaster Model Number_____

Blaster Serial Number_____National Board Number_____

2.4 Vessel Information

2.4.1. All pressure vessels used in Schmidt® Abrasive Blasters are manufactured in strict accordance with the provisions of the ASME Code Section VIII, Div. 1. Please contact your local authorized distributor with your serial number ready to obtain a Manufacturer's Data Report.

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. Welding on the vessel performed by welders not properly qualified per the ASME Code voids the ASME/NB integrity of that vessel.

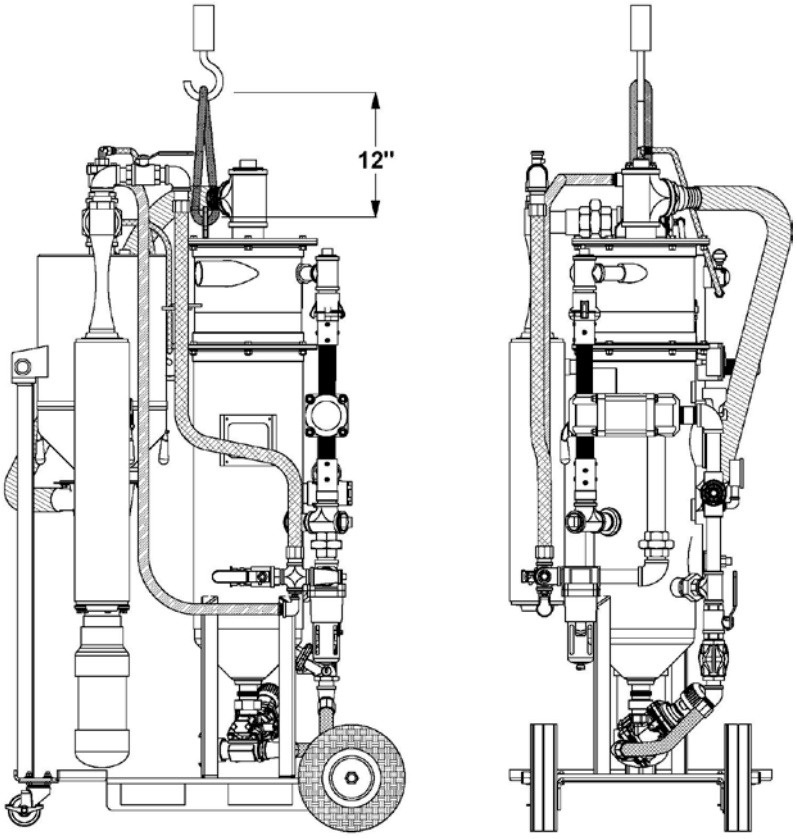
2.5 Notes

2.6 MiniBRS™ Lifting Diagram and Dimensional Specifications

The MiniBRS is equipped with wheels and casters for portability. Use properly sized ramp to load system onto transporting vehicle. Secure unit onto pallets for forklift handling.

⚠ 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.



Empty weight = 360 lbs. (excluding hoses)

Figure 2.6(a) – MiniBRS Lifting Diagram

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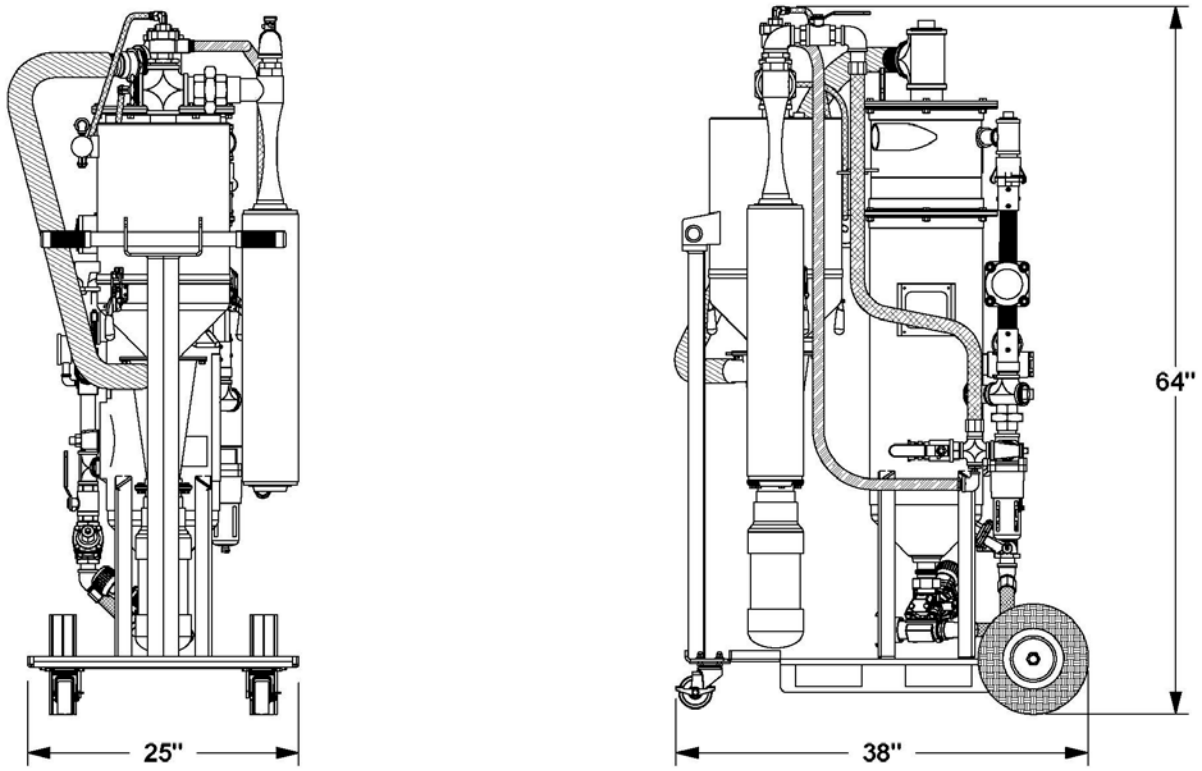
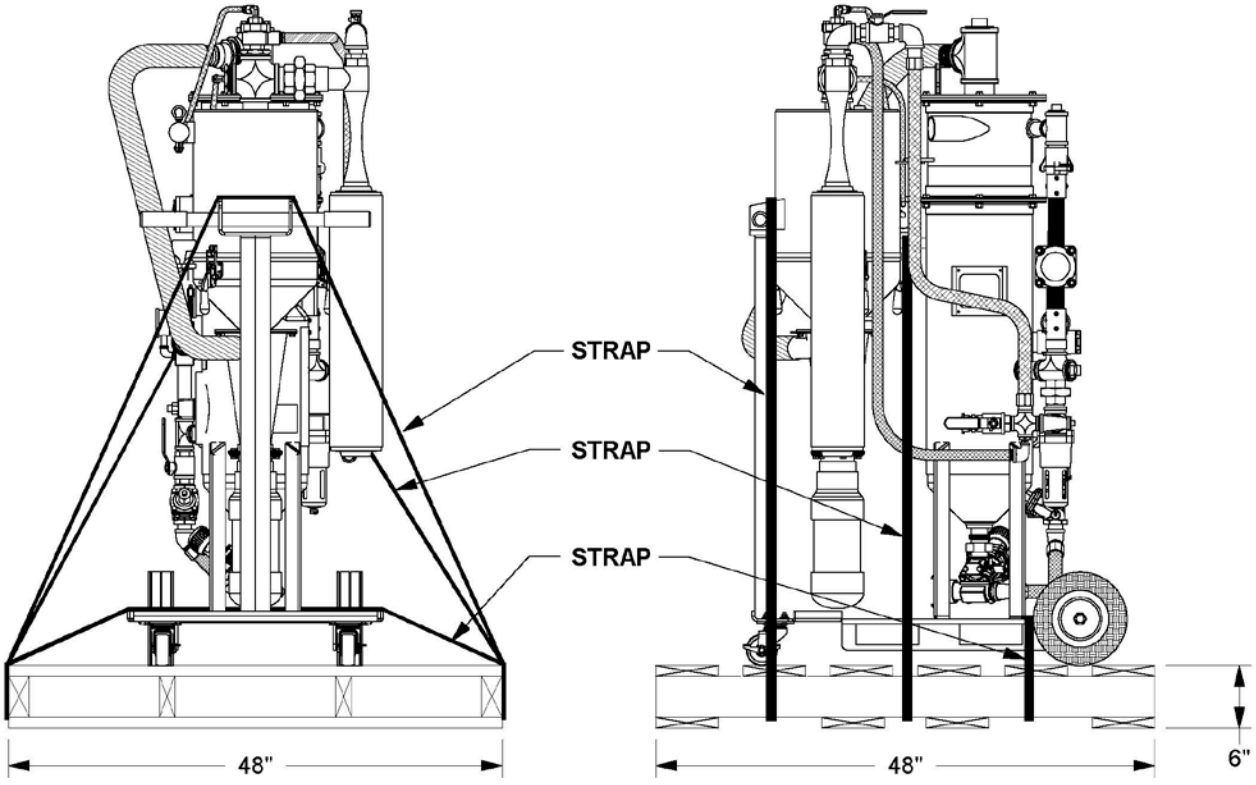


Figure 2.6(b) – MiniBRS™ Dimensional Data



Position blaster on pallet as shown to prevent movement.
Strap blaster to pallet as shown to protect piping from damage.
Empty weight including pallet and hoses = 439 lbs.

Figure 2.6(c) – MiniBRS Packing / Strapping 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

The Mini BRS is a portable unit and can be rolled to locations where blast jobs are performed. Position the unit to allow accessibility to the handway and for ease of abrasive filling. Pay close attention to object(s) that may be in the path of the pressure vessel exhaust air (depressurization). See Section 5.7 for system depressurization.

Note: The MiniBRS front casters are equipped with wheel locks to prevent rolling. Apply the wheel locks once the equipment is rolled into position.

3.2 Compressed Air Requirements (blast nozzle)

The blast nozzle size and blast pressure largely 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. Enough air supply capacity is necessary to maintain the system air pressure. Insufficient air flow capacity will result in reduced blast nozzle pressure and lost productivity. The air compressor must be large enough to supply:

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

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

iii. A 185CFM air compressor should be enough to operate this system when equipped with a 75CFM eductor and a #3 blast nozzle.

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3.4 Blast System Air Supply Line

The air supply hose and fittings must be rated at a minimum of 150 psi operating pressure. The air supply hose from the air compressor to the blast unit should be at least the same diameter as the air inlet piping (see Section 9.0). This size hose will be large enough to supply the required airflow to operate the blast unit controls and each blast nozzle. See Sections 5.2 and 5.17 for further information on air hose connection.

NOTE: If the abrasive blast system will be installed in a permanent location, the inlet connection can be hard piped. Do Not install hard piping that is smaller than the piping size of the blast system. Smaller piping size will reduce the air flow capacity. If other equipment will be using the same source of air as the abrasive blaster, install a check valve at the air inlet. This will prevent air pressure back flow, which will carry abrasive into the blast control system.

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 connections on the pressure vessel and cause 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 failure of the pressure vessel. Hard piping connected to the pressure vessel must include supports to eliminate the possibility of applying a load 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 prevent air pressure backflow only use a non-relieving air regulator. Air pressure backflow will carry abrasive from the blast vessel and contaminate the blast control system. **CRITICAL**: **Any inlet air valve or air pressure regulator added to the system must have enough 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 (5psi max.) at the required cfm air flow.**

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

3.6 Blast System Air Quality

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

3.7 Electrical Requirements (Applicable to systems with electrical controls)

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

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.

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.

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3.8 Abrasive Selection

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

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

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

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

3.9 Breathing Air Quality

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

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

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

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

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

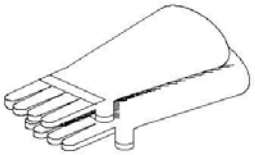
3.10 Personal Protective Equipment (PPE)

Abrasive blasting has many hazards that may cause injuries to operators. To protect operators from injury each must be supplied with and required to use Personal Protective Equipment. The Occupational Health and Safety Administration (OSHA) requires the employer to assess the workplace to determine what PPE is necessary and supplied to each operator (Reference 29 CFR 1910 Subpart I). OSHA requires that this equipment meet or be equivalent to standards developed by the American National Standards Institute (ANSI). Figure 3.10 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.

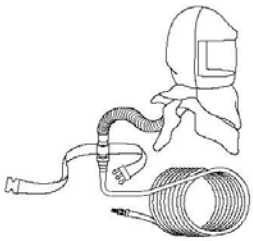
Safety Glasses
Reference OSHA 29 CFR 1910.133
Must meet ANSI Z87.1

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

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

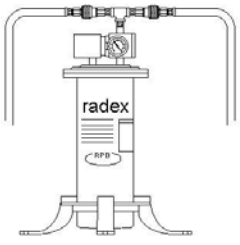


Gloves
Reference OSHA 29 CFR 1910.138
No Applicable ANSI Standard

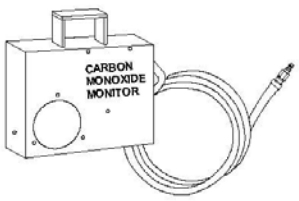


Respirator
Reference OSHA 29 CFR 1910.134
Must be NIOSH approved

Protective Clothing
Reference OSHA 29 CFR 1910.132
No Applicable ANSI Standard



Airline Filter
Reference OSHA 29 CFR 1910.134
Must be NIOSH approved



Carbon Monoxide Monitor
Reference OSHA 29 CFR 1910.134

Figure 3.1 - Personal Protective Equipment

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3.11 Pressure Relief Valve Installation

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

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

⚠ 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.

⚠ WARNING

In special cases at the request of customer, a pressure relief valve may be included with the equipment. It is the responsibility of the owner/user to confirm that the supplied pressure relief valve meets all local regulations.

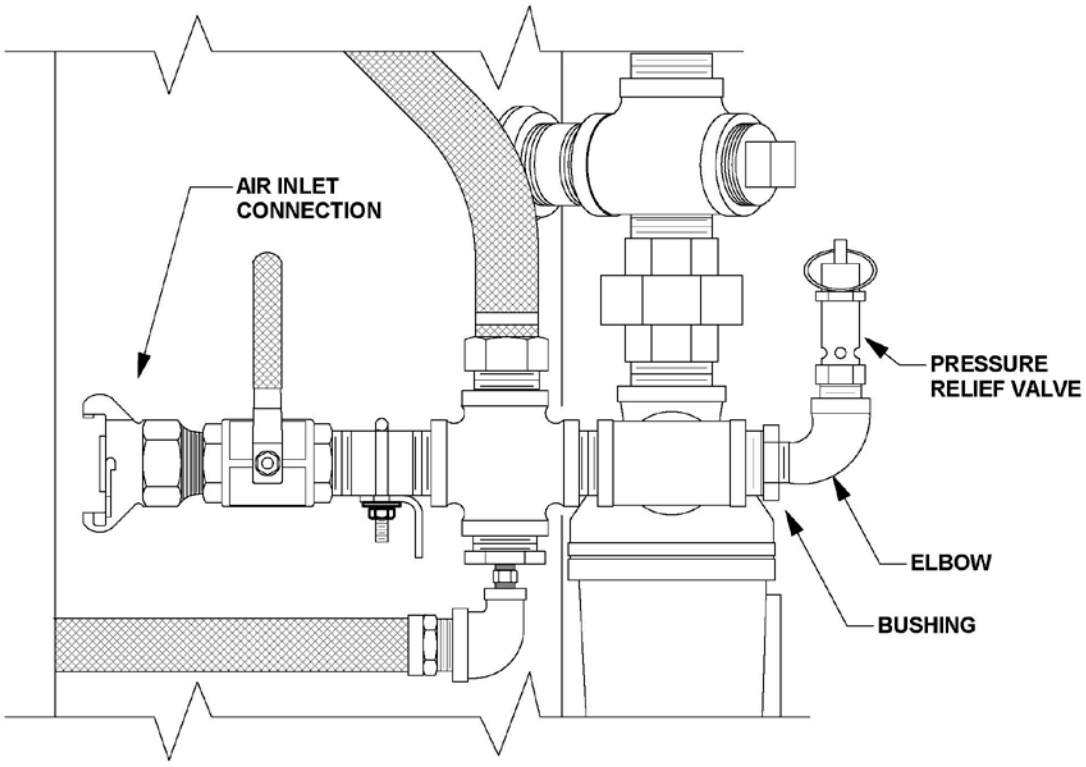

Figure 3.2 – Suggested location for air pressure relief valve.

3.12 INSTALLATION CHECKLIST (Photocopy this page to use as an installation 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 TeraValve™ at the pipe union and check for debris inside. Trapped debris can vibrate loose during shipment and later block abrasive flow. If necessary, vacuum the bottom of tank.

☐ ***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 Air Prep 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 pressure 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.

☐ ***Install ground:*** install earth ground. Electrically bond components. See Section 5.14.

☐ ***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.

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

The blast abrasive is loaded into the abrasive blaster through a top fill port. All the compressed air within the abrasive blaster must be completely vented to atmosphere before it can be filled with abrasive. The abrasive can be bag loaded or loaded from a Schmidt storage hopper. BRS type units are equipped with vacuum systems that enable them to be pneumatically filled. To begin blasting, the fill port is closed, and the abrasive blaster is filled with compressed air from the air compressor. Since moisture creates problems in the blast operation, it is common for the compressed air to be fed through a moisture removal device, such as a Schmidt AirPrep System. The air pressure in the abrasive blast vessel is equal to the air pressure in the blast hose where it connects at the 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 strip rust and paint from work surfaces. The abrasive blast stream and the dust it creates are harmful; therefore, all operators and exposed personnel 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. Contact Axxiom to locate a distributor.

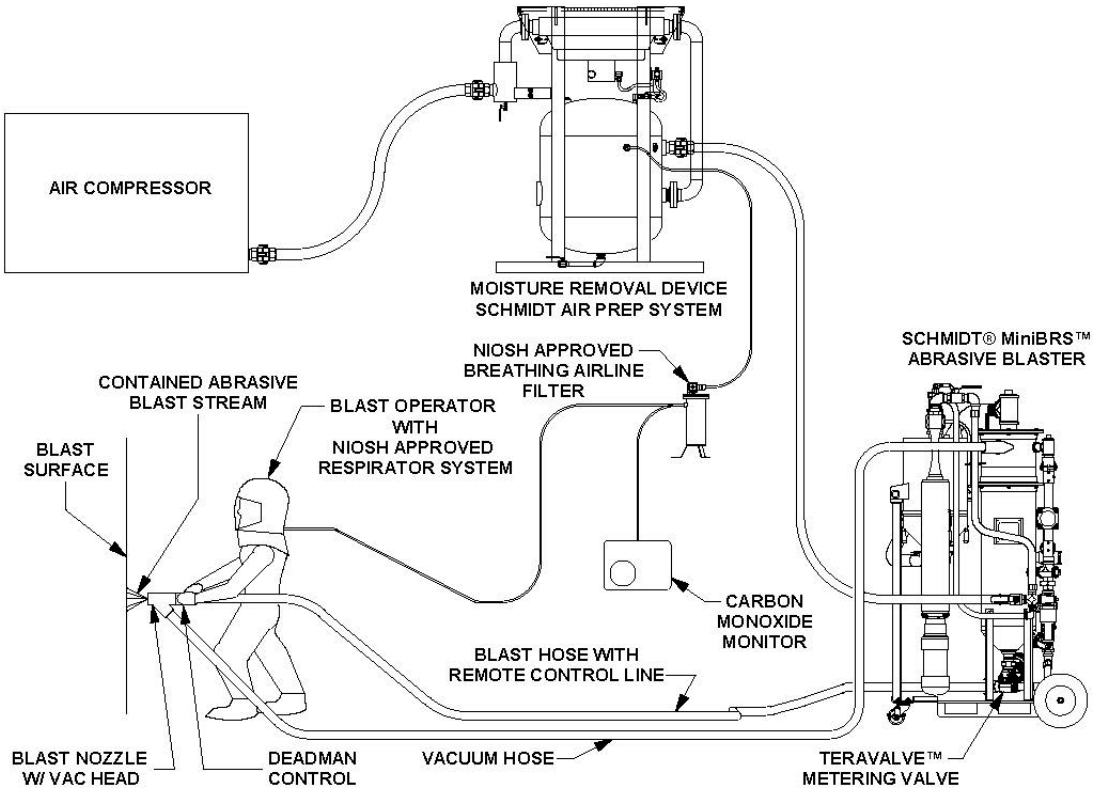

Figure 4.1 – Typical MiniBRS™ Abrasive Blast System

5.0 MiniBRS™ Abrasive Blast System General Operation

Refer to Figure 5.1 on following page to better understand the general operation of the MiniBRS™ abrasive blaster. Do not attempt to operate the abrasive blaster before reading all sections of this manual and following all setup procedures. See Sections 5.1 through 5.22 and Section 6.0.

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

This recycling of the abrasive can be repeated several times depending on the type of abrasive used. After each cycle of the abrasive the particle become smaller and eventually will be carried through the reclaim system and is captured in the cyclone (#38) or dust collector (#39). The dust collector filters the vacuum air and traps the waste dust for disposal.

The MiniBRS performance is optimal with steel abrasive. However, other abrasives can be used. Softer abrasives will produce dust at a faster rate which will require more dust collector filter maintenance.

The MiniBRS abrasive blaster (#36) is a depressurized system; meaning the blaster will pressurize only when the ComboValve® (#8) is opened by pressing the deadman lever (#17).

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

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

Blasting stops when the deadman lever (#17) is released. This will close the automatic air valve (#12). Tera Valve (#14), and the ComboValve (#8). The abrasive blaster vessel (#36) will depressurize at the same time. The compressed air in the abrasive blaster will exhaust through the blowdown hose (#7) into the reclaim hopper (#37).

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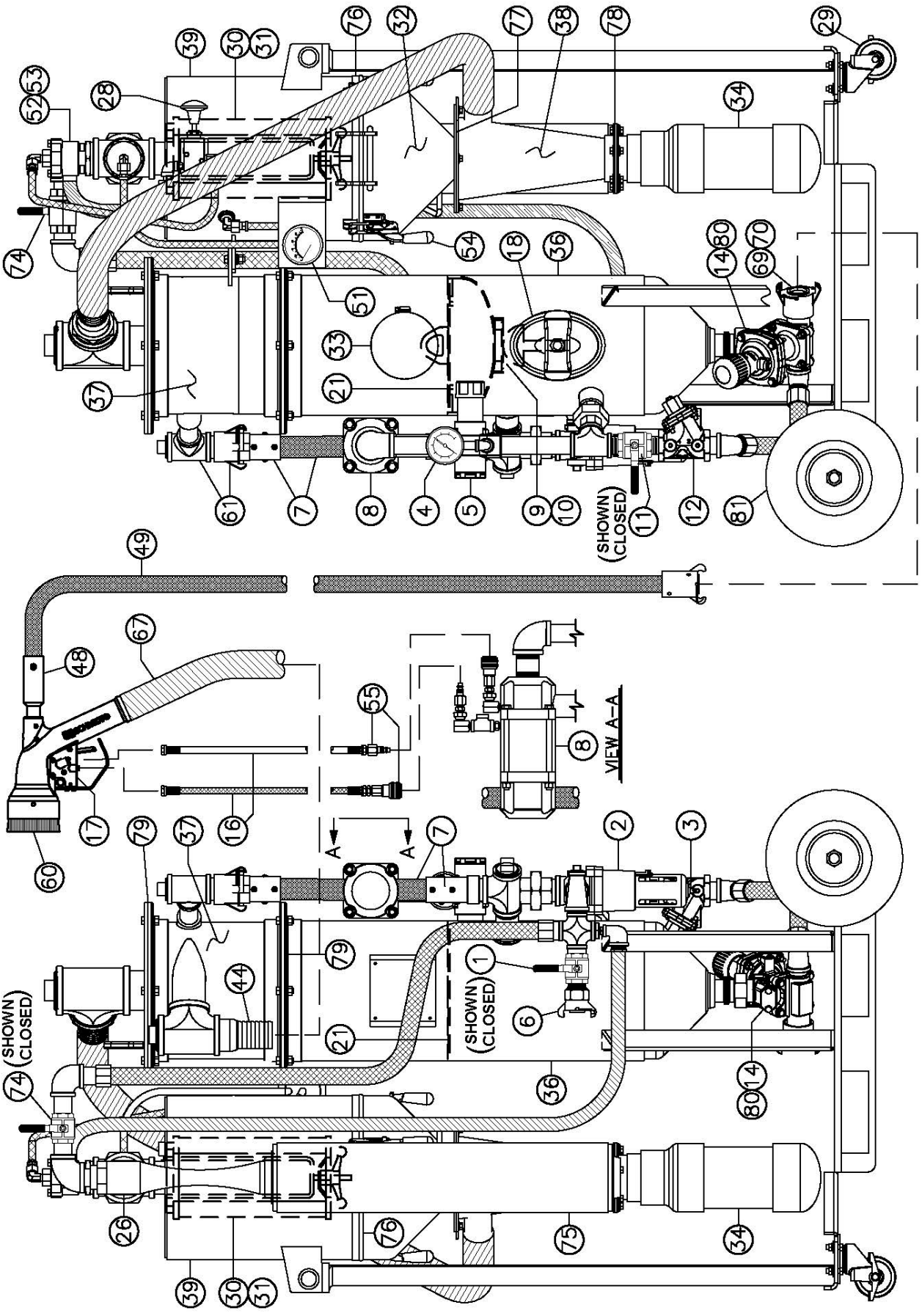

Figure 5.1 – Typical MiniBRS™ Abrasive Blaster

5.1 Popup Valve (abrasive inlet)

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

⚠ WARNING

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

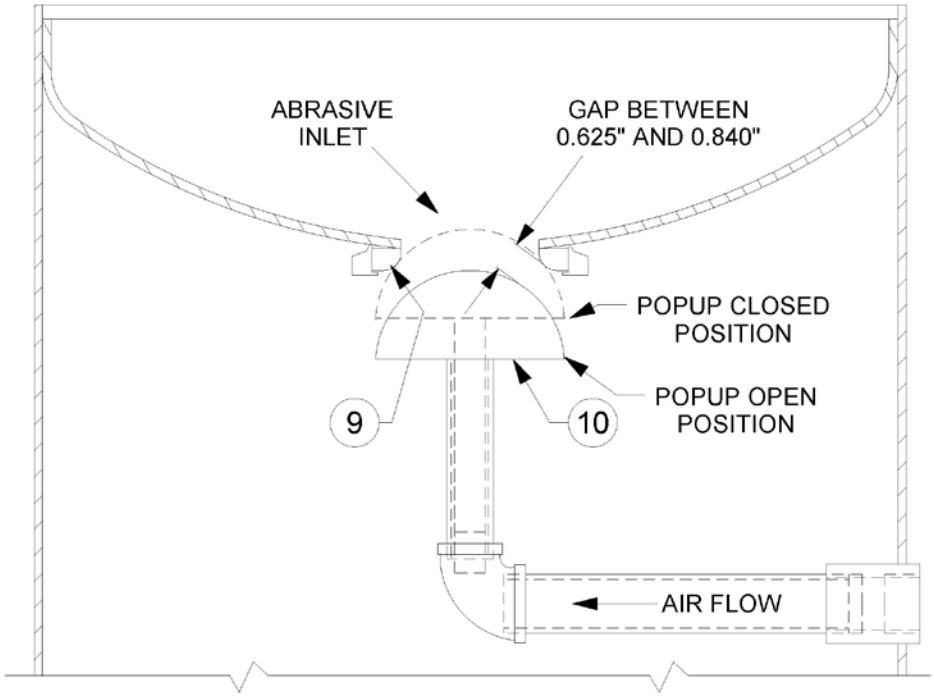

Figure 5.2 – Standard Popup Assembly

5.2 Air Supply Connection

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

5.3 Air Inlet Ball Valve

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

5.4 Inlet Air Filter

Air flow into the MiniBRS Blast System passes through the inlet air filter (#2) which removes moisture, oil, and dirt particles from the inlet air. The water and debris that is removed is drained by opening the drain valve (#3) at the bottom of the filter. This drain 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.

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5.5 Regulated Tank/Blast Pressure Control

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

5.6 Full Pressure Bypass

The bypass piping is not an option available on a MiniBRS.

5.7 ComboValve® (blast vessel pressurization/blowdown)

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

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

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

When the ComboValve closes the pinch ram on the blowdown hose (#7) is released and the air inside the blast vessel (#36) will exhaust through the blowdown hose. The blast vessel (#36) remains depressurized when the ComboValve (#8) is closed. The abrasive blaster must be depressurized before filling with abrasive or before performing any maintenance. (See Section 9.4). BRS systems are equipped to enable vacuum loading.

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

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

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

5.8 Choke Valve

The choke valve (#11) is a ball valve located in the blast air line upstream of the Tera Valve™ XL™. The choke valve is used to clear any trash that may get into the blast vessel and block the Tera Valve XL orifice. Whenever trash (paint chip, cigarette butt, etc.) blocks the Tera Valve XL orifice the procedure is to fully open the Tera Valve XL knob, then press down the deadman lever (#17) to begin blasting. While blasting, have an assistant close the choke valve completely for about one second. This creates differential pressure at the Tera Valve XL (high pressure above; low pressure below). The higher pressure from the blast vessel should be enough to loosen the trash blocking the Tera Valve XL orifice and blast it through the blast nozzle (#48). To minimize excess wear of the Tera Valve XL, keep the choke valve fully open during normal blasting.

Note: If the Mini BRS abrasive blaster is equipped with the abrasive cut-off feature set the cut-off valve (or switch) to the on-position for the choke procedure. See Section 9.10.

NOTICE

See Section 11.3.2 for further safety information regarding the choke procedure.

⚠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

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

5.10 Tera Valve™ XL™ (abrasive metering valve)

The Tera Valve (#14) is a normally closed valve that opens to supply abrasive into the blast air stream. The Tera Valve opens when it receives air to its signal port (see Section 9.5). This happens when the deadman lever (#17) is pressed down which opens the automatic air valve (#12) and the Tera Valve simultaneously. When the deadman lever is released the air signal from the deadman vents through the quick exhaust valve (#80) and Tera Valve spring closes to stop abrasive flow to the blast hose (#49) and nozzle (#48).

The Tera 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 Tera Valve. The knob sets the stopping point of the plunger (See Section 9.5). Turning the knob clockwise reduces the orifice size which decreases abrasive flow. Turning the knob counterclockwise increases the orifice size which will increase the abrasive flow to the blast nozzle. The Tera Valve 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 9.5.

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The Tera Valve™ XL™ has a flanged cleanout used to purge trash that blocks abrasive flow. This is done by removing the clean out plug and pressing down the deadman lever (#17). The blast air flow purges trash through the clean out valve. The plug must be replaced after purging and the two retaining bolts securely tightened to 7 ft.lb

Note: Units manufactured prior to 2017 are equipped with a Thompson® 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)

The union ball valve is used to block the abrasive flow to the Tera Valve XL. This allows the user to remove the Tera Valve XL 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 Tera Valve XL from blast vessel. See Figure 5.4.

Note: The union end ball valve option is only available for custom MiniBRS systems.

⚠ DANGER

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

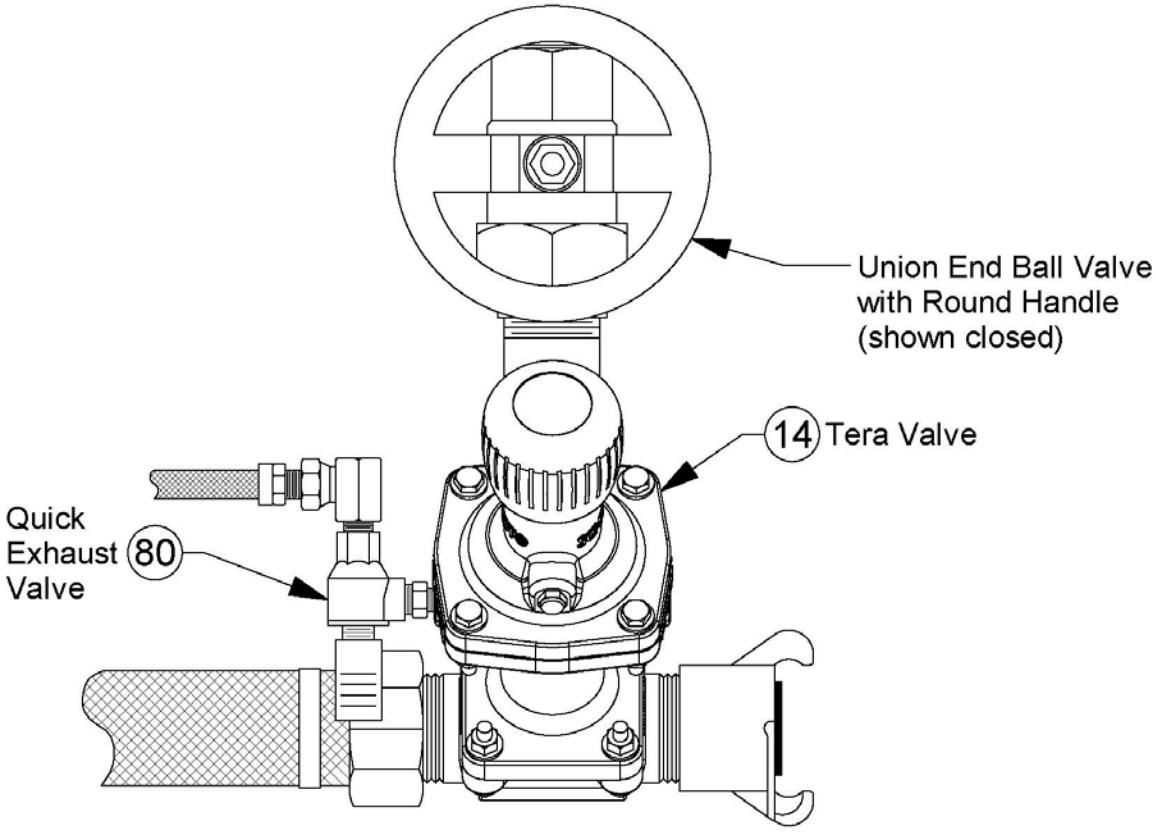

Figure 5.4 – Union End Ball Valve (If Equipped)

5.12 G2 Trigger Deadman Valve/Switch

The G2 Trigger Deadman valve/switch is part of a system that controls the blast operation. The G2 Trigger Deadman valve/switch (#17) allows the operator to remotely start and stop the blast operation. The deadman is integrated into the vacuum workhead at the end of the blast hose assembly (#49) to give the operator easy control of the blast operation (see Section 5.16).

The G2 Trigger 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 activate the blast operation. Blast activation will send an air signal that opens the ComboValve® (#8), the automatic air valve (#12) and the Tera Valve™ XL™ (#14). See Sections 9.1 and 9.8.

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

Note: Units manufactured prior to 2019 were equipped with standard G2 pneumatic or electric deadman.

5.12.1. Pneumatic Deadman System: When the pneumatic G2 Trigger Deadman lever (#17) is pressed down air supply from the orange hose of the twinline hose (#16) flows into the black hose. Air flows through the black hose sending air signals to the ComboValve® (#8), the automatic air valve (#12), and the Tera Valve XL (#14). When the deadman lever is released, the air signal is cut off and the signal air vents from the deadman lever (#17). See Figure 5.5 and the drawings in Section 9.1.

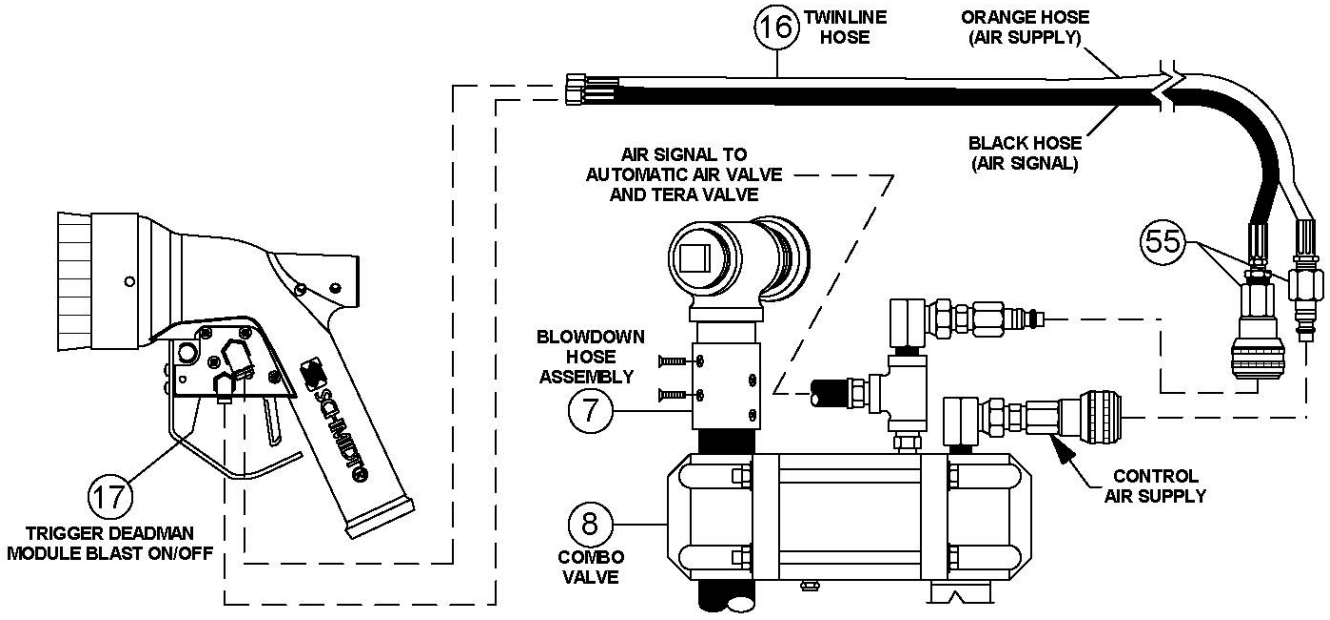

Figure 5.5 – Pneumatic Blast Control System

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5.12.2. Electric Deadman System (Optional): When the electric G2E Trigger 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 ComboValve® (#8), the automatic air valve (#12) and the Tera Valve™ XL™ (#14). When the deadman lever is released the electric circuit is cut off closing the control valve. The signal air vents from the breather (#66). See Figure 5.6 and Section 9.3.

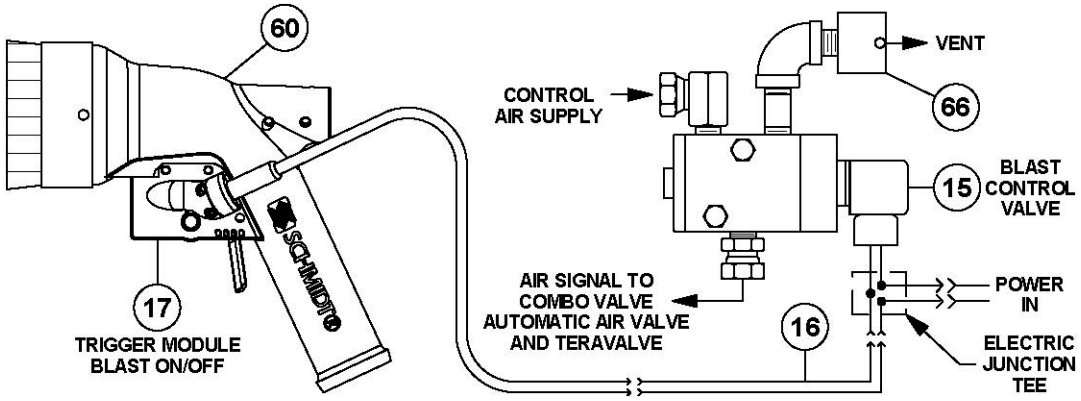

Figure 5.6 – Electric Blast Control System

5.13 Abrasive Cut-Off (Optional)

An optional feature of a blaster is an abrasive cut-off. The purpose of the abrasive cut-off is to allow blasting air without abrasive. This is useful for blowing off abrasive from the blasted item. To blast with air only set the abrasive cut-off valve (or switch) to the off position then press down the deadman lever (#17). This will send a control signal to the Combo Valve and automatic air valve only: therefore, only blast air will exit the blast nozzle (#48). For the abrasive cut-off to work a control valve is needed that provides a signal to the Tera Valve XL separate of the air signal to the automatic air valve. Refer to drawings in Section 9.10 and 9.11.

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

5.14 Blast Hose

The blast air and abrasive mixture flows from the Tera Valve XL to the blast nozzle (#48) through the blast hose assembly (#49). The standard length of the blast hose for the MiniBRS™ is 25ft; however, blast hose extensions can be added to increase length. However, when adding to blast hose length simultaneous blast and recovery may not be possible; or may be reduced causing abrasive leaks at the vacuum workhead. For higher efficiency keep the blast hose as short as possible. Increased blast hose length causes pressure drops 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 chance of static electrical shock to operating personnel only use anti-static blast hose and/or vacuum hose, properly electrically bond the blast nozzle, blast hose couplings, and the equipment, and properly install an earth ground to the abrasive blaster.

⚠ CAUTION

Static electric shock hazard. To minimize chance of static electrical shock to operating personnel only use anti-static blast hose, properly electrically bond the blast nozzle, blast hose couplings, and the equipment, and properly install an earth ground to the abrasive blaster.

⚠ 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 should there be an accidental loss of control of the blast hose.

5.15 Blast Nozzle

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

The nozzle size can be identified by a small number visible on the outside. This number represents the nozzle throat diameter in sixteenths of an inch; for example, a #3 nozzle has a throat diameter of 3/16". See the tables in Section 13.0 for approximate air and abrasive consumption for each nozzle.

Note: The MiniBRS™ Vacuum Workhead is design for only two nozzle size options; #3 (3/16”) or #4 (1/4). The standard size provided with the equipment is a #3 (3/16”).

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.

Note: The nozzle throat will wear with use increasing the diameter. The increase in throat diameter will increase the air consumption which will impact the performance in applications where air supply is limited.

The best nozzle size for a specific application is 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. There are two blast nozzle options for the MiniBRS™ for closed cycle blasting. These are #3 (3/16”) and #4 (1/4”).

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 eductor (#26) capacity. This will prevent blast air and dust from blowing out around the nozzle brushes on the BRS vacuum workhead (#60). The recommended blast nozzle size to be used in closed blasting varies depending on the length and diameter of the vacuum hose. Use the following general guidelines for reference:

BLAST PRESSURE	NOZZLE SIZE
15 psi or less	#4 Nozzle
30 psi or less	#4 Nozzle
50 psi or less	#4 Nozzle
100 psi or less	#3 Nozzle

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

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5.16 BRS Vacuum Workhead

The BRS vacuum workhead (#60) is an accessory used when operating in the closed blasting mode (blasting with simultaneous vacuum recovery). The blast abrasive is contained within the workhead and it is recovered by the vacuum system. The blast nozzle (#48) with integrated hose coupling fits into the MiniBRS™ vacuum workhead (#60). Then the suction hose (#67) attaches to the bottom of the vacuum workhead. The vacuum hose to MiniBRS vacuum workhead is usually a tight fit, so no further seal is required at that joint. All other joints in the vacuum line are sealed with hose clamps. The BRS is equipped with brushes and a center wear tube that attach to the working end of the workhead (see Figure 5.7 and Section 9.9). The brushes and center tube are wear components and should be inspected and replaced periodically. When operating in the closed blasting mode requiring the use of a vacuum workhead assembly, it is important to remember that this limits the size of blast nozzle (#48) that can be used due to limitations created by the workhead and the available compressed air volume. Refer to Sections 3.0 and 13.1 to determine compressed air requirements. See Section 9.9 for workhead parts break down.

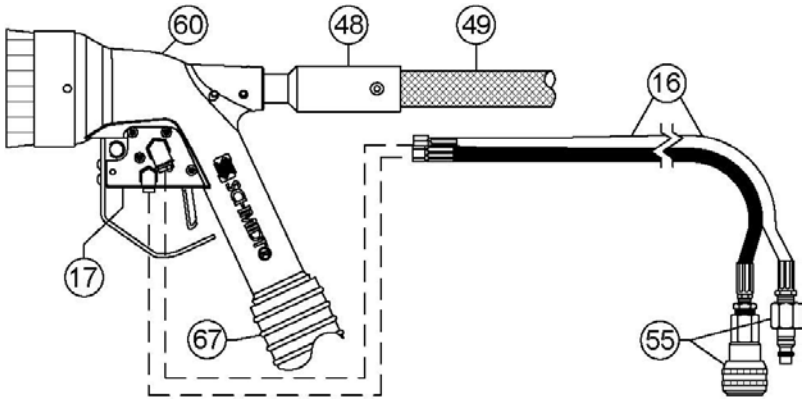

Figure 5.7 – Workhead Connections

5.17 Hose Connection

All air hose, blast hose, and threaded couplings have 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. See drawing in Section 9.1.

⚠ 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.

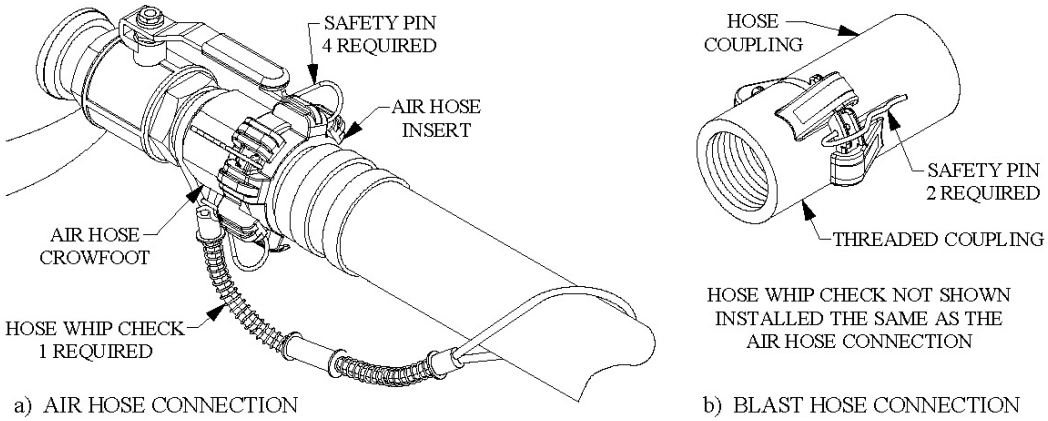

Figure 5.8 – Hose Connection Disconnect Protection

5.18 Vacuum System

The vacuum system is used for abrasive recovery during closed blasting (simultaneous blasting and recovery), or to vacuum recover abrasive at completion of open blasting. The main component of the vacuum system is the pneumatic vacuum eductor (#26). The vacuum eductor is powered by a minimum of 75 CFM of compressed air at 100 psig. The vacuum system is activated by opening the ball valve (#74) located above the vacuum eductor. The vacuum generated by the vacuum eductor can be regulated by the supply ball valve (#74). When the system is activated, the vacuum pressure is indicated on the pressure gauge (#51) located on the dust collector (#39). The vacuum system exhausts air through a muffler (#75).

Pneumatic Vacuum Eductor System Sequence of Operation (See Figure 5.10):

a) Open supply ball valve (#74) to begin vacuum.
b) Vacuum load a premeasured amount of abrasive into reclaim hopper (#37).
c) Check DP gauge (#51) for filter status (clean (pulse) or change if greater than 15 in. w.g.)
d) Close supply ball valve (#74) to stop vacuum.

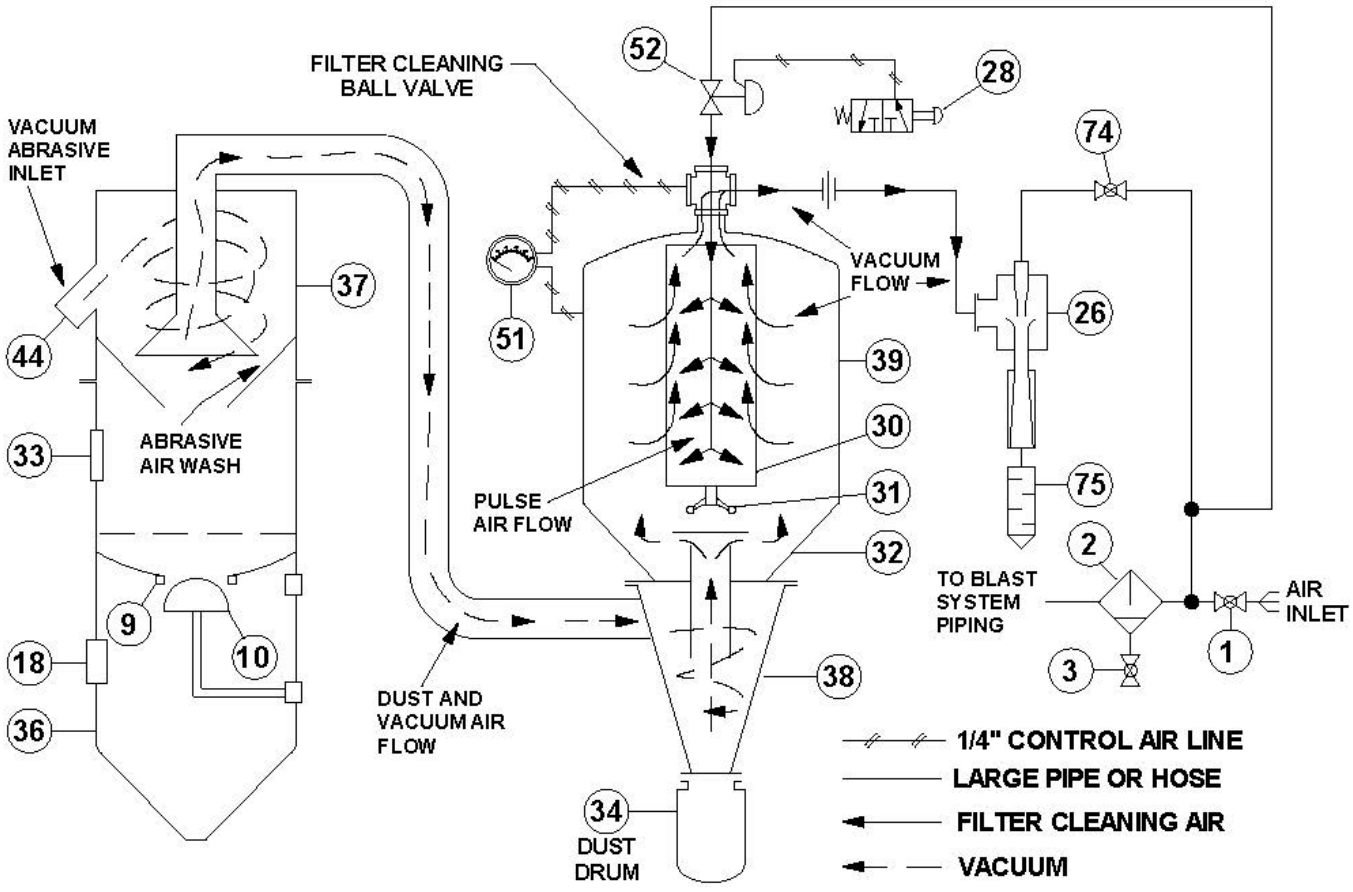

Figure 5.10 – Vacuum System Diagram

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5.19 Non-Adjustable Airwash Reclaim Hopper

The function of the abrasive reclaim hopper (#37) is to receive the abrasive recovered by vacuuming. The abrasive and other debris enter the abrasive reclaimer at the inlet (#44). Large heavier abrasive particles fall to the bottom of the reclaimer. Small lighter abrasive particles and dust remain in the air stream and are carried from the reclaimer (#37) into the secondary cyclone (#38) then to the dust collector (#39). There is an abrasive screen (#21) inside the reclaimer that prevents debris (paint chips, cigarette butts, etc.) from passing into the pressure vessel (#36). When blasting is interrupted and the pressure vessel is depressurized, the popup valve (#10) opens which allows the abrasive accumulated in the reclaimer to fall through the screen and enter the pressure vessel. The screen (#21) should be inspected and vacuum cleaned periodically. It can be accessed through the access cover (#33) of the abrasive reclaimer.

Note: The standard screen is perforated 1/8”; however, a larger 3/16” mesh screen is available.

NOTICE

Large objects such as a cloth rag or glove can inadvertently be vacuumed into the reclaimer hopper and get trapped at the abrasive airwash clogging the air flow. The clogged object will reduce vacuum recovery performance and cause dust to be released at the vacuum workhead. Refer to figure 5.10.

5.20 Secondary Cyclone

The function of the secondary cyclone (#38) is to provide additional separation of dust particles prior to entering the dust collector (#39). This separation of large and small dust particles will extend the life of the dust collector filter (#30). The air/dust flow enters the cyclone at the tangential inlet. As it enters the velocity is reduced causing the heavier particles to drop out of the air stream and down to the bottom of the cyclone. The cyclone empties into a dust bin (#34) which must be periodically emptied.

⚠ WARNING

Pinch Point Hazard. The dust bin filled with abrasive dust can be heavy. Do Not place your hand below the dust bin while turning it for removal. It can abruptly fall and potentially pinch hand or fingers against the system skid plate. Grip dust bin with both hands on the side while unscrewing it for removal.

⚠ 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 bin. See Sections 3.8, 3.10, and OSHA 29 CFR 1910.134.

5.21 Dust collector

The dust-filled vacuum air stream from the secondary cyclone enters the dust collector (#39) where the dust particles are filtered out a pleated cartridge filter (#30). The filter is held in position by a winged knob (#31) which seals it against the bottom of the tube sheet in the dust collector. The air filter can be accessed for removal or inspection by disengaging the three latches (#54) to completely remove the dust collector access cover (#32). To remove the filter (#30), loosen the winged knob (#31) so that it can be removed. The filter must be cleaned regularly to prevent clogging (see Section 5.22) which will assure longer life (see Section 8.17). Filters requiring maintenance (clogged filters) will be apparent by an elevated differential pressure reading on the gauge (#51) [greater than 15 in. w.g.] connected to the dust collector.

The filtered vacuum air stream is extracted from the dust collector through the pneumatic vacuum eductor (#26). The dust removed from the air stream collects in the removable dust collector bin (#32). The dust collector bin must be periodically emptied for proper function. Disengage the three latches (#54) to remove dust bin (#32) and empty collected 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.

5.22 Manual Pulse System

The function of the manual pulse system is to clean the cartridge filter (#30) by using compressed air to flush the filter loosening and dislodging the dust particles from the surface.

The pulse system consists of the pulse valve (#52) and the pulse control valve (#28). The pulse valve provides the burst of air that agitates the air filter (#30) and loosens dust collected on the outside of the filter. The pulsed dust is pushed away from the filter and then drops to the bottom of the dust collector.

The pulse control valve (#28) provides the momentary signal to open the pulse valve (#52). The pulse control valve is tapped with the palm of the hand in a quick stroke. For proper pulse operation do not hold the pulse control valve knob for an extended period. Refer to Figure 5.10.

Pulse requirements

The required interval between pulses is determined by the blasting conditions. The softer the abrasive the more dust will be created while blasting which will require more frequent pulsing. As particles begin to clog the filter the differential pressure across the dust collector tube sheet will increase. This increase can be detected on the differential pressure gauge (#51). Generally, pulsing is required when the differential pressure reading on the gauge reaches 15 in. w.g. Apply short quick taps of the pulse control valve (#28) to pulse to clean the filter. Continue to pulse until the differential pressure drops below 10 in. w.g.

Note: The pulse effectiveness may be improved when the vacuum system is turned off by closing the eductor ball valve (#74). However, the vacuum system must be turned back on to read the differential pressure.

NOTICE

If pulsing does not reduce the differential pressure below 10-12 in. w.g. remove the filter and for a thorough mechanical cleaning. Or replacing the filter is recommended.

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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 *MiniBRS™ 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 MiniBRS Abrasive Blaster Setup Procedure (see Figure 6.1)

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 minimize chance of static electrical shock to operating personnel only use anti-static blast hose, properly electrically bond the blast nozzle, blast hose couplings, and the equipment, and properly install an earth ground to the abrasive blaster. See Section 5.14.

⚠ CAUTION

Static electric shock hazard. To minimize chance of static electrical shock to operating personnel only use anti-static blast hose, properly electrically bond the blast nozzle, blast hose couplings, and the equipment, and properly install an earth ground to the abrasive blaster. See Section 5.14.

6.1.3. To mitigate risk of dust explosion avoid blasting in confined spaces without proper ventilation. Consult plant authorities. See Section 1.20.

⚠ DANGER

Explosion Hazard. Self-Ignition of Dust. Do Not operate the AmphiBlast Abrasive Blast system in confined spaces without proper ventilation. Consult plant authorities. See Section 1.20.

6.1.4. Do Not operate this equipment without a pressure relief device in place. The ASME Code requires that all vessels be provided 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.

6.1.5. 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.

6.1.6. 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.*

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

6.1.7. Close the air inlet ball valve (#1), choke ball valve (#11), and abrasive shut-off valve if so equipped.

6.1.8. Empty the dust bin (#34) by unscrewing it from below the secondary cyclone (#38). Reinstall hand tight. **Note:** Place a catch mat or cardboard below to capture overflow if the dust bin is overfilled.

Pinch Point Hazard. The dust bin filled with abrasive dust can be heavy. Do Not place your hand below the dust bin while turning it for removal. It can abruptly fall and potentially pinch hand or fingers against the system skid plate. Grip dust bin with both hands on the side while unscrewing it for removal.

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

6.1.9. Open the dust collector access cover (#32) by disengaging the three latches (#54) to remove the cover. The dust collector access cover (#32) includes a detachable hinge to allow it to be separated from the dust collector (#39).

6.1.10. Check that the dust collector filter (#30) is present and in good condition. Inspect the access cover gasket (#76). Replace the filter or gasket if damage is present.

Defective or damaged components will result in reduced vacuum performance and abrasive release at the vacuum workhead.

6.1.11. Reinstall the dust collector access cover (#32), then tighten by engaging the three latches (#54).

6.1.12. Properly install the vessel handway (#18) (see Section 6.3). Check that the reclaim hopper access port (#33), and the dust collector access cover (#32) are closed and tightened.

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6.1.13. Check the twinline (or cord) connections (#16) to the trigger deadman (#17). Then tie wrap the twinline hose or electric deadman extension cords to the blast hose (#49).

6.1.14. Make sure that nozzle (#48) is secured on to blast hose assembly (#49) and tightened in position in the vacuum workhead (#60).

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

⚠ WARNING

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

6.1.16. Connect the twinline hose quick disconnects (or cord connectors) (#55) to the mating disconnects on the ComboValve® (#8). Note: On electric units the mating cord connectors are on the electric junction tee. See Figure 6.2 (b).

⚠ WARNING

Reversed twinline connection will result in blast operation not shutting down when the deadman is released.

6.1.17. Connect a 150psi rated (minimum) air supply hose to the air inlet crowfoot (#1) and install safety pins and a hose whip check to prevent accidental disconnections during operation. See Section 5.17 and 8.7.

⚠ WARNING

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

6.1.18. On electrical controlled MiniBRS™ systems confirm that the electric power is connected.

⚠ DANGER

Electric shock hazard. Contact with electric system and cause serious injury or death. Disable the electric power prior to performing any maintenance. Service and maintenance must be performed by a qualified electrician.

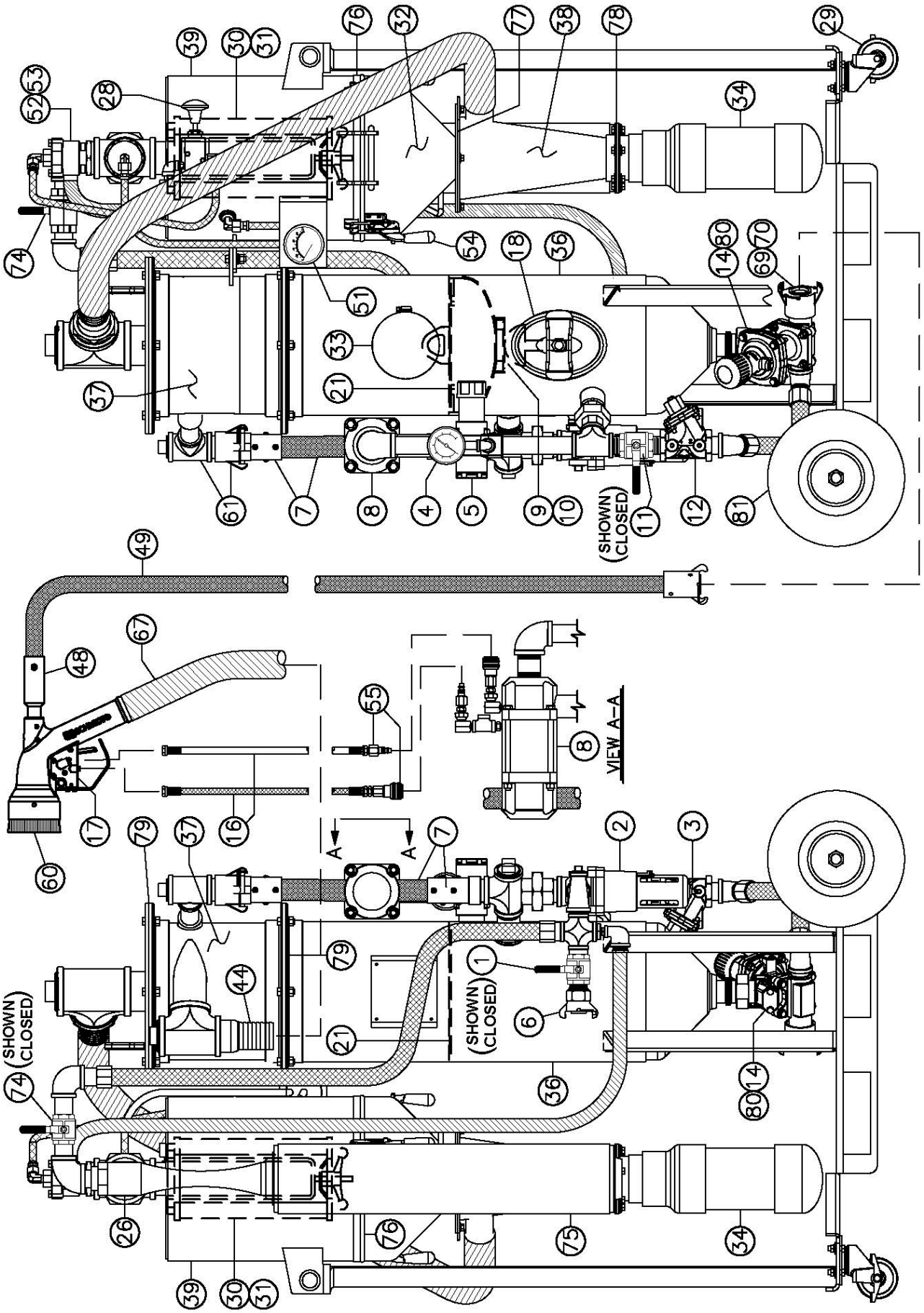

Figure 6.1 – Typical MiniBRS™ Abrasive Blaster

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6.2 MiniBRS™ Abrasive Blaster Depressurizing Procedure (Blowdown)

⚠ CAUTION

Do not leave the abrasive blaster pressurized during long periods of no usage. Undetected air leaks can cause costly wear damage to the pressure vessel (i.e. at abrasive inlet and handway).

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

6.2.2. The MiniBRS abrasive blast system will automatically depressurize when the deadman lever (#17) is released. The blast vessel air pressure will exhaust through the blowdown hose (#7) and into the reclaim hopper (#37). See Figure 6.1.

⚠ WARNING

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

6.2.3. The MiniBRS abrasive blast system is equipped with a deadman control system. Disconnect the twinline disconnects (#55) from the deadman control systems to disable the blast controls. This will prevent the inadvertent pressurization of the blast pot. See Figure 6.2.

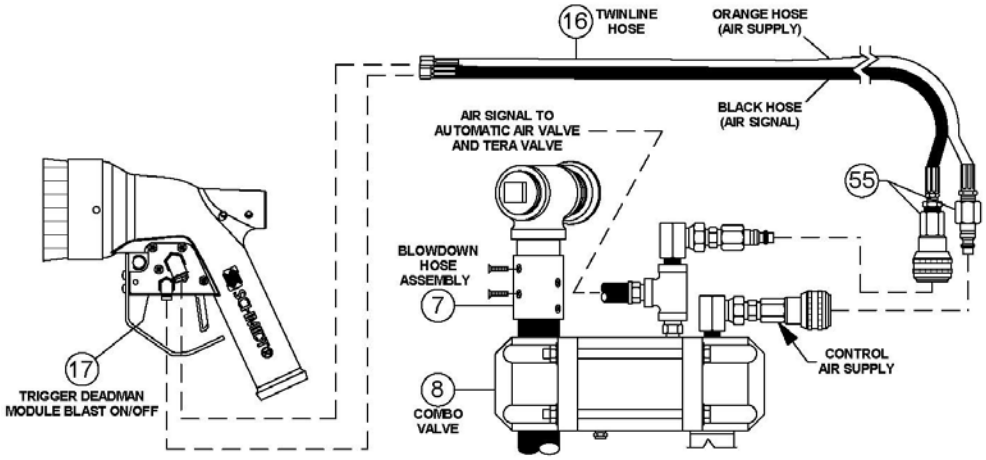

Figure 6.2(a) – Pneumatic Blast Control System

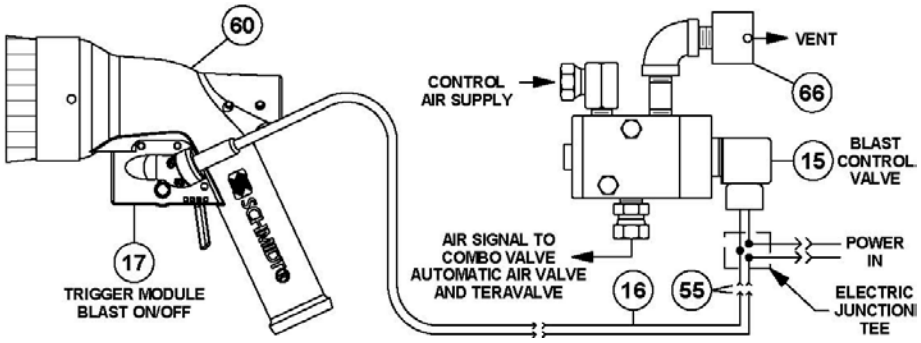

Figure 6.2(b) – Electric Blast Control System (Optional)

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

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

a) Measure and write down the inside dimension's "A" and "B" of the handway weld ring. See Figure 6.3(a).

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

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

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

⚠ DANGER

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

6.3.2. 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.

6.3.6. Center the gasket on the handway weld ring.

6.3.7. Center the handway cover on the gasket.

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

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

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

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

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

6.3.13. Periodically check for leaks.

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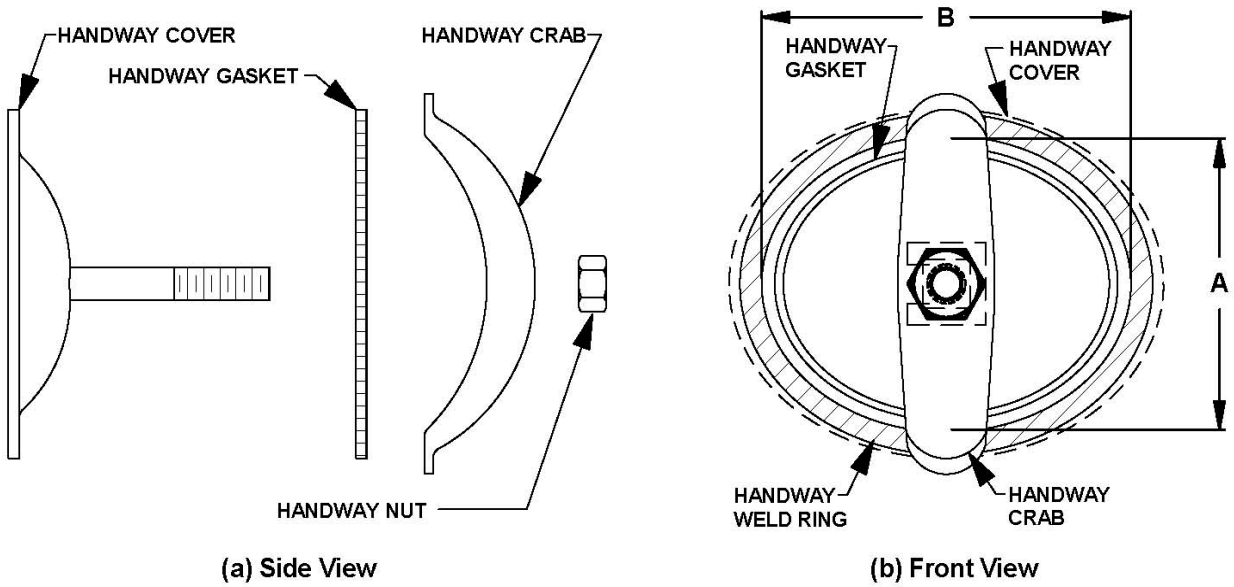

Figure 6.3 (a) – Handway Assembly

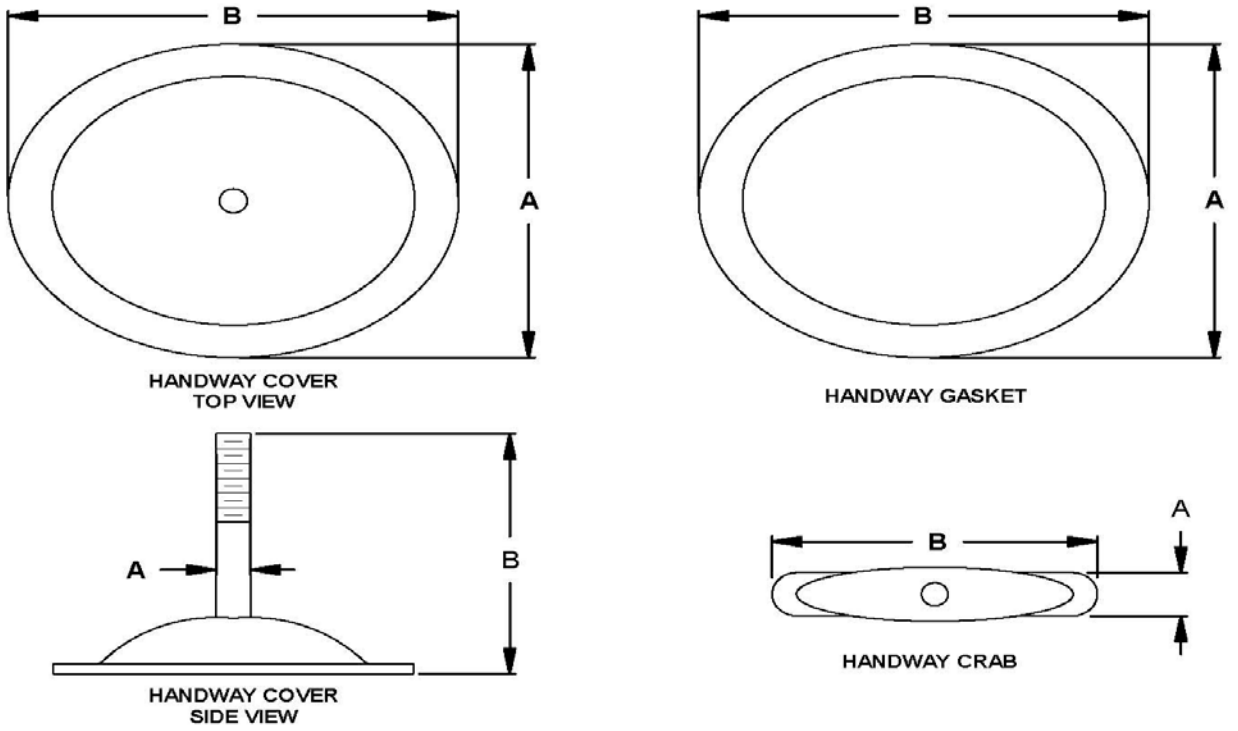

Figure 6.3 (b) – Handway Components

4” x 6” Handway Dimensions		
Component	A	B
Weld Ring	4-1/2”	6-1/2”
Cover (Top)	5-1/4”	7-3/16”
Handway Gasket	5-1/2”	7-1/2”
Handway Crab	1-5/8”	5-1/2”
Cover (Side View)	3/4” – 10UNC	4-1/2

Table 6.3 (c) – Handway Component Dimensions

7.0 Operating Instructions

7.1 Filling the MiniBRS™ Abrasive Blast System with Abrasive

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

⚠ WARNING

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

7.1.2. Connect the vacuum hose (#67) to vacuum inlet connection (#44).

7.1.3. Close the vacuum system air supply ball valve (#74).

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

7.1.5. The vacuum hose will be used to vacuum a pre-measured amount of abrasive into the blast vessel (#36). The system abrasive capacity is 0.46 cubic foot. However, it will be easier to measure by weight the amount of abrasive to vacuum load. This amount will vary depending on the density of the abrasive to be used. Below is a chart that provides the fill amount for various abrasives:

Garnet:	65 lbs.	Starblast XL:	56 lbs.
Steel grit:	115 lbs.	Aluminum oxide:	54 lbs.

7.1.6. While securely holding the loose end of the vacuum hose (#67) open the vacuum system air supply ball valve (#74) to turn the vacuum flow “ON”.

7.1.7. Use the end of the vacuum hose (#44) to vacuum the pre-measured abrasive into the reclaimer (#37) and into the blast vessel (#36).

7.1.6. Do Not overfill. Overfilling will cause good abrasive to carry over into the secondary cyclone (#38) and the dust collector (#39). Overfilling may also prevent the popup from properly sealing. See Section 8.4.

7.1.7. Check reading on differential pressure gauge (#51).

7.1.8. Use the pulse system to clean filter if the differential pressure gauge reading is greater than 15 in. w.g. Refer to 5.22.

Note: The pulse effectiveness may be improved when the vacuum system is turned off by closing the eductor ball valve (#74). However, the vacuum system must be turned back on to read the differential pressure.

NOTICE

If pulsing does not reduce the differential pressure below 10-12 in. w.g. remove the filter and for a thorough mechanical cleaning, or replacing the filter is recommended.

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7.2 Open Cycle Blast Operation (without simultaneous vacuum recovery)

7.2.1. The MiniBRS™ 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 MiniBRS 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. If so equipped, open the abrasive shutoff valve. See Section 5.11.

7.2.4. Open the manual choke valve (#11). The choke valve must be completely open 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 Tera Valve™ XL™ (#14).

7.2.5. For initial startup turn the Tera Valve XL knob (#14) counterclockwise about four turns from fully closed 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. Slowly open the air inlet ball valve (#1). The ball valve is closed when the handle is perpendicular to the body. See Figure 7.2.

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

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

7.2.9. The following steps are for setting the required blast pressure and abrasive flow. These determinations 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. A step for checking the system for air leaks will be detailed.

Note: The following steps can be performed with or without the vacuum workhead (#60); however, if closed cycle blasting will be used follow the steps in Section 7.3 prior to proceeding below.

⚠ WARNING

The following steps require a second operator to safely perform these leak checks and valve adjustments while the other the blast operator holds the deadman to maintain the system pressurized.

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

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

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

7.2.12. If necessary, have a second operator adjust the abrasive flow at the knob on the Tera Valve™ XL™ (#14). Turn clockwise for less abrasive flow and counterclockwise for more abrasive. Due to the length of the blast hose there will be a slight delay in control of the abrasive flow at the nozzle; therefore, allow a few seconds before adjusting further.

Note: If the blaster is equipped with the optional abrasive cut-off feature set the valve (or switch) to the “on” position to blast with abrasive. See Section 9.10.

7.2.13. While the blast system is pressurized have a coworker check the handway, hoses, and piping for leaks. Periodically check for leaks thereafter.

7.2.14. Re-test the blast air and abrasive mixture again on a test piece to determine if further adjustment is needed. Release the deadman lever (#17) to stop blasting.

7.2.15. 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 7.2.14 must be made after completing the instructions given in Section 7.3.

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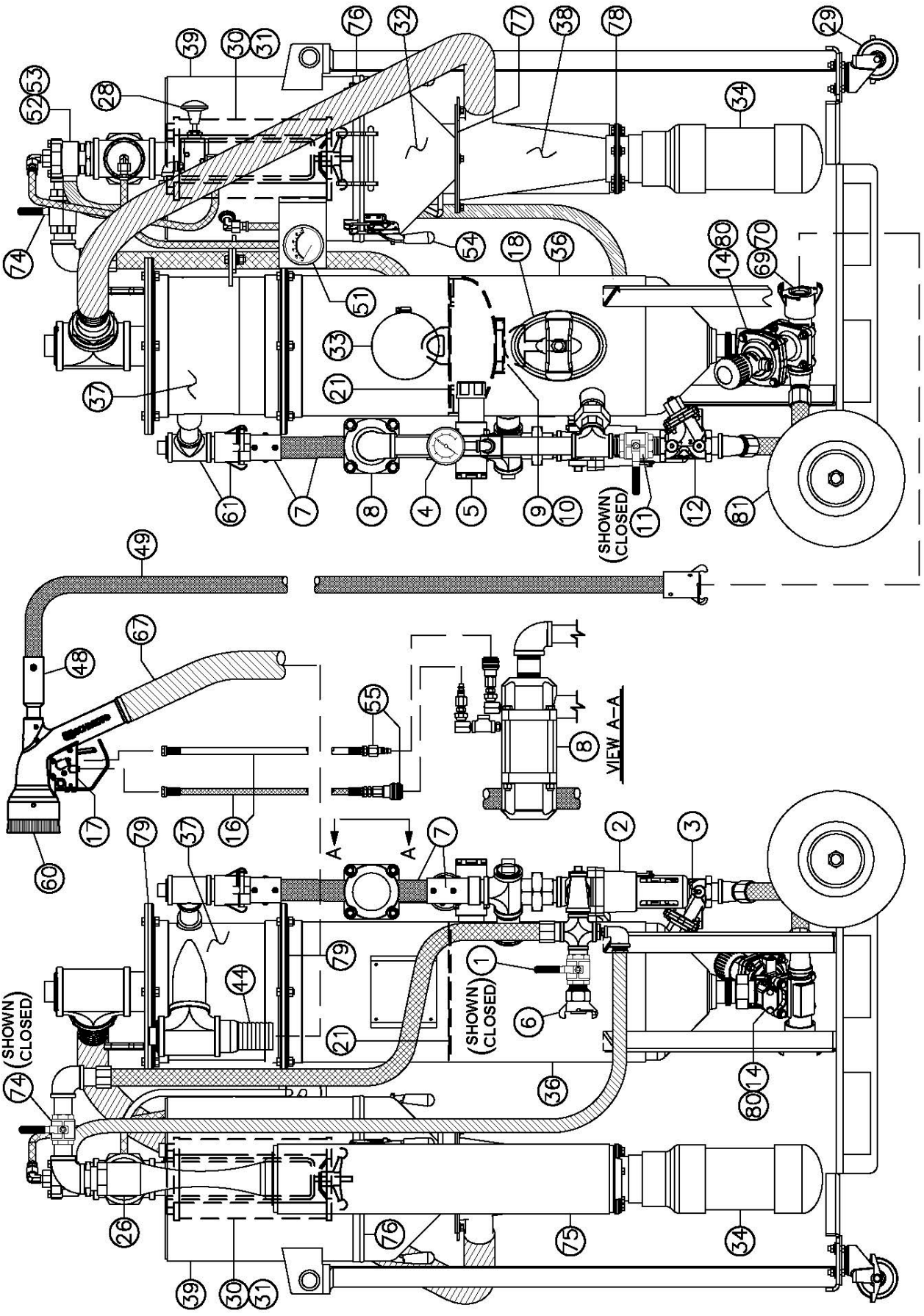

Figure 7.2 – Typical MiniBRS™ Abrasive Blaster

7.3 Closed Cycle Blast Operation (simultaneous blast and vacuum recovery)

7.3.1. The MiniBRS™ 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 closed cycle mode (blasting with simultaneous vacuum recovery) requires the MiniBRS vacuum workhead (#60) and a vacuum hose (#67). See Section 5.16.

7.3.3. Inspect the brushes on the MiniBRS vacuum workhead (#60). Replace if worn or damaged. Refer to drawing in Section 9.9.

7.3.4. Connect the nozzle / hose assembly (#48 & #49) to the BRS vacuum head (#60).

7.3.5. Connect the vacuum hose (#67) between the vacuum workhead and the reclaimer vacuum port (#44). See Figure 7.2 and 7.3.

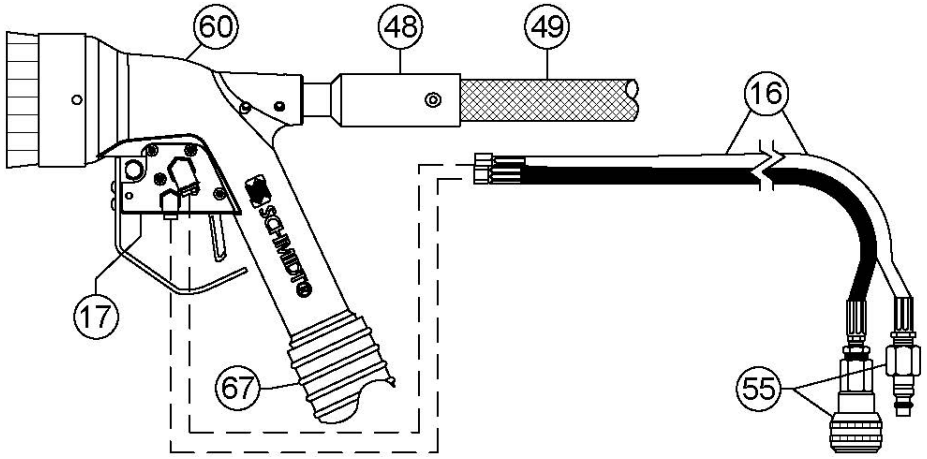

Figure 7.3 – Workhead Connections

7.3.6. Place the BRS vacuum workhead (#60) against the surface to be blasted.

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

⚠ WARNING

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

7.3.8. Make necessary adjustments to the blast pressure and abrasive flow as detailed in steps 7.2.9 through 7.2.14 in Section 7.2.

7.3.9. Re-test the blast air and abrasive mixture again on a test piece to determine is further adjustment is needed. Release the deadman lever (#17) to stop blasting.

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7.4 Ending the Blast Operation (See Figure 7.2)

⚠ CAUTION

Do not leave the abrasive blaster pressurized during long periods of no usage. Undetected air leaks can cause costly wear damage to the pressure vessel (i.e. at abrasive inlet and handway).

7.4.1. Closed the vacuum air supply ball valve (#74). Do not shut off vacuum while closed cycle blasting. This will cause release of dust and abrasives.

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

⚠ CAUTION

Do not turn off the air compressor and allow the abrasive blaster air pressure to back flow through the system. Back flow will carry abrasive back into the piping contaminating the controls.

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

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

⚠ CAUTION

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

7.5 Vacuum Recovery of Blast Abrasive

7.5.1. After open blasting the used abrasives can be vacuum recovered back into the MiniBRS™ blast system by following the filling procedure given in Section 7.0. DO NOT overfill blast pot

7.5.2. The used abrasive will contain dust particles that will be carried into the secondary cyclone (#38) and the dust collector (#39). Clean the dust collector filter (#30) using the pulse system (#28 & #52) when differential pressure gauge (#51) reading is higher than 15 in. w.g. Refer to 5.22.

7.5.3. Empty the cyclone dust bin (#34) and the dust collector dust bin (#32) as detailed in Section 6.1.

⚠ WARNING

Pinch Point Hazard. The dust bin filled with abrasive dust can be heavy. Do Not place your hand below the dust bin while turning it for removal. It can abruptly fall and potentially pinch hand or fingers against the system skid plate. Grip dust bin with both hands on the side while unscrewing it for removal.

⚠ DANGER

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

8.0 Maintenance and Inspection Instructions

DANGER

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

WARNING

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

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

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

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

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

8.4. ***Popup Assembly:*** The popup alignment and operation are 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 use, and weekly thereafter. Inspect the popup as follows:

a) Depressurize the MiniBRS abrasive blaster per Section 6.2.
b) Disconnect air supply hose from the air inlet crowfoot (#1).
c) Inspect the popup gasket (#9) and popup head (#10) sealing surfaces for wear or deformations. Replace either if necessary.
d) Check that the popup is centered within the gasket opening. If necessary, use a pry bar as a lever between the popup and gasket to deflect the internal support piping and shift the popup to the center of the gasket opening.
e) Check the popup gap (distance between the popup surface and the gasket). It should be between 0.625” and 0.840”. See Figure 8.1. An excessive gap is created by a vertical nipple that is too short. An excessive gap will expose the top of the vertical nipple to abrasive when the popup closes which could result in premature wear to the popup.
f) After checking the alignment and gap, pressurize the blast vessel and check the popup for air leaks. If a leak is present, repeat the above steps to isolate the problem.

WARNING

Pinch point hazard. Vessel pressurization will compress the popup against the popup gasket. Keep fingers clear of the popup opening while pressurizing the blast vessel. Disconnect air supply prior to performing popup maintenance.

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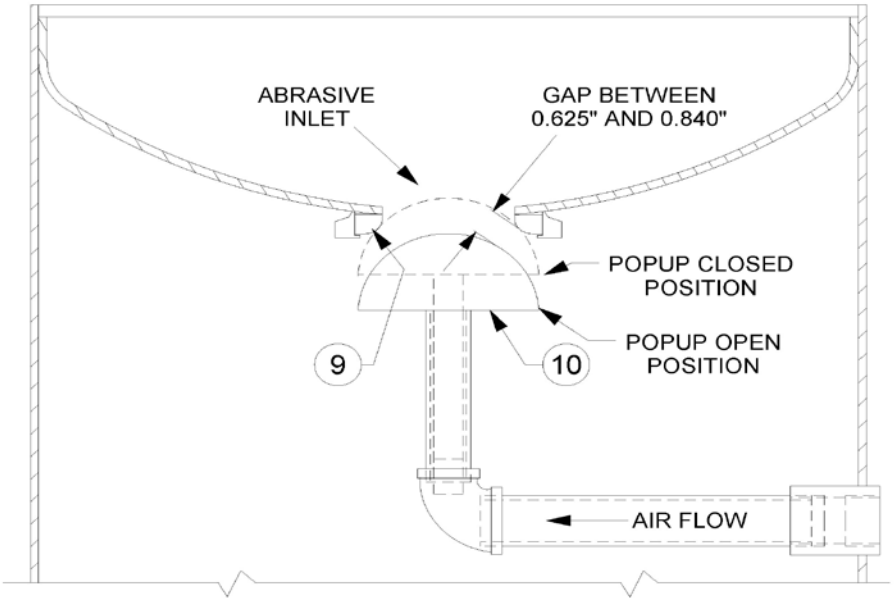

Figure 8.1 – Standard Popup Assembly

8.6. ***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 has 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 minimize chance of static electrical shock to operating personnel only use anti-static blast hose, properly electrically bond the blast nozzle, blast hose couplings, and the equipment, and properly install an earth ground to the abrasive blaster. See Section 5.14.

⚠ 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 chance of static electrical shock to operating personnel only use anti-static blast hose, properly electrically bond the blast nozzle, blast hose couplings, and the equipment, and properly install an earth ground to the abrasive blaster. See Section 5.14.

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

⚠ 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.

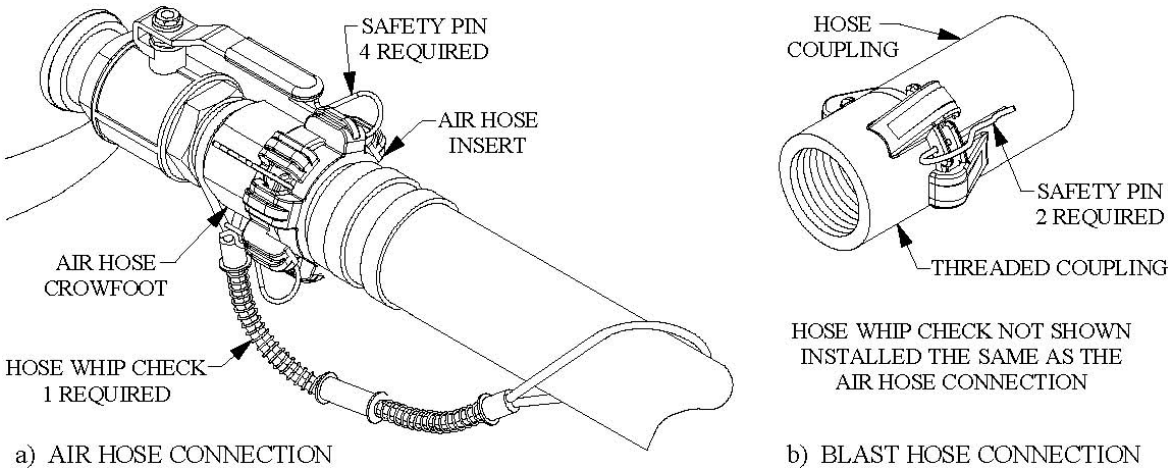

Figure 8.2 – Hose Connection Disconnect Protection

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

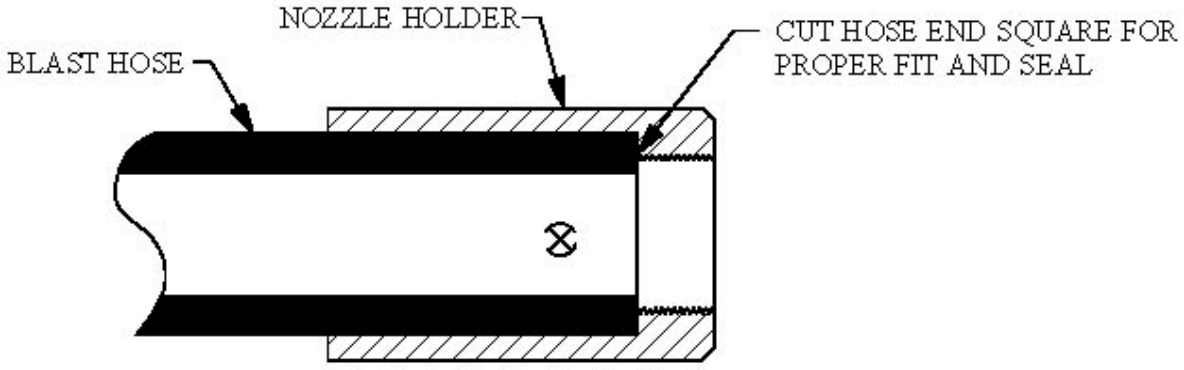

Figure 8.3 – Hose End Fit up

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

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8.10. ***Valves:*** Thompson® Valves, TeraValve™ XL™, Automatic air valves, MV3® Valves, ComboValve®, 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 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. Refer to valve drawings in Section 9.0 and specific valve maintenance manual.

Once a day check if air is leaking from end of blast nozzle when the blast operation is off. A worn seat or trash in the Thompson or TeraValve™ usually causes this (See Section 11.3.5). Clean or replace by removing the four bolts in the base of the valve to allow disassembly.

⚠ DANGER

Depressurize vessel before performing any maintenance. See Section 6.2. Removing the TeraValve™ 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.

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

⚠ WARNING

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

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

⚠ DANGER

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

8.13. ***ComboValve® Blowdown Hose:*** The blowdown hose (#7) that passes through the ComboValve (#4) 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 ComboValve pinch ram from sealing the exhaust flow thorough the hose and result in equipment malfunction due to pressure loss. The abrasive carry-over will also wear the pipe fittings upstream. See Figure 8.4. Depressurize the abrasive blaster per Section 6.2 and check hose condition weekly. Replace as needed. When replacing the blowdown hose (#7) but make sure that the hose does not make any tight bends anywhere between the blast pot and the reclaimer because this will cause the hose wear to be much more rapid. Also replace the pipe fittings upstream of the ComboValve. These fittings (#61) are the 1-1/4” x close air flow restrictor nipple, 1-1/4” x 1” reducing tee, the 1-1/4” pipe plug, and the 1” x 5” nipple. (see Figure 8.4). Replace the hose with another section of hose.

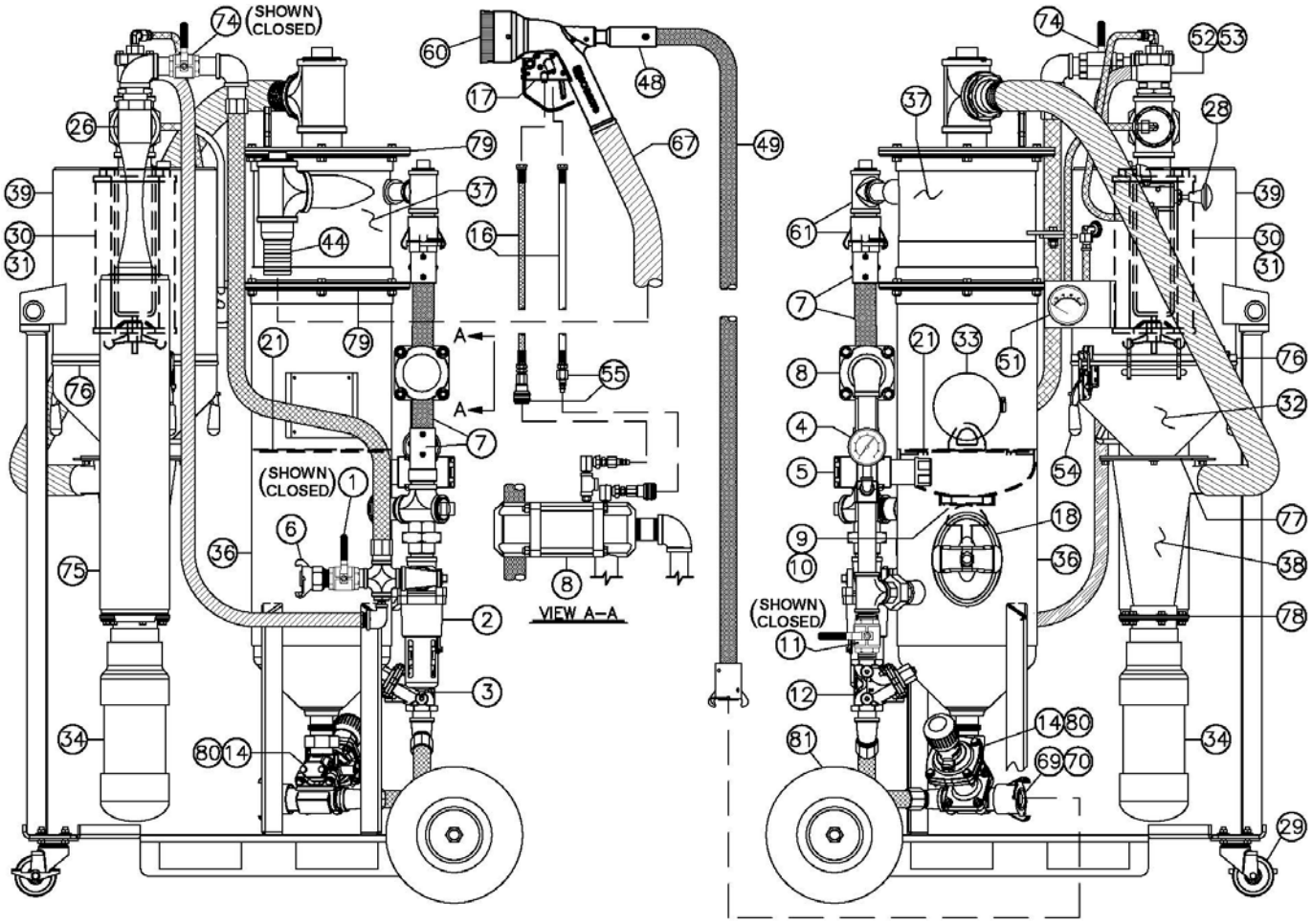

Figure 8.3 – Typical MiniBRS™ Abrasive Blaster

8.14. ***Airwash Reclaimer Hopper:*** The abrasive screen (#21) inside the reclaimer hopper above the blast vessel (#36) will accumulate trash screened from the vacuum reclaimed abrasive. The screen should be cleaned daily or more frequently if conditions dictate. It can be accessed through the reclaimer access cover (#33). A short 2" hose attached at the vacuum connection (#44) on the reclaimer (#37) can be used to vacuum the debris on the screen. Re-attach the workhead vacuum hose (#67) when finished. A shop vac can also be used to clean the screen.

NOTICE

Large objects such as a cloth rag or glove can inadvertently be vacuumed into the reclaimer hopper and get trapped at the abrasive airwash clogging the air flow. The clogged object will reduce vacuum recovery performance and cause dust to be released at the vacuum workhead. Check the airwash area when cleaning the screen. Refer to figure 5.10.

8.15. ***Secondary cyclone:*** During the vacuum recovery the depleted abrasive that is carried through the reclaimer accumulates in the dust bin (#34). The dust bin must be emptied periodically (30-60 minutes of blasting time). Dustier conditions may require more frequent emptying. Unscrew the bin (#34) from the bottom of the cyclone (#38). The bin can then be removed so the depleted abrasive can be disposed of properly. Spare dust bins can be obtained to minimize shutdown time. See Section 5.20.

⚠ WARNING

Pinch Point Hazard. The dust bin filled with abrasive dust can be heavy. Do Not place your hand below the dust bin while turning it for removal. It can abruptly fall and potentially pinch hand or fingers against the system skid plate. Grip dust bin with both hands on the side while unscrewing it for removal.

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8.16. ***Dust collector:*** During vacuum recovery depleted abrasive accumulates inside the dust collector (#32) and drains into the dust bin (#34). Dust buildup can accumulate on the dust collector inside walls. Once a week the dust collector and dust collector access cover inner surfaces should be brushed to loosen and remove dust buildup.

⚠ DANGER

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

8.17. ***Dry filter cleaning:*** To achieve longest life of the dry filter it is important that it be serviced regularly. The service interval is dependent on the blast conditions. The following methods are recommendations to assist in cleaning MiniBRS™ dry filter (#30). The first three are for both paper element filters and polyester element filters. However, be aware that the washing method is for polyester element filters only.

8.17.1. Manual Pulsing

The MiniBRS is equipped with a manual pulsing system (#28 & #52) that utilizes compressed air to blow off the fine dust that has accumulated on the exterior of the filter cartridge (#30). Generally, pulsing is required when the differential pressure reading on the gauge reaches 15 in. w.g. Apply short quick taps of the pulse control valve (#28) to pulse to clean the filter. Continue to pulse until the differential pressure drops below 10 in. w.g. See Section 5.22.

Note: The pulse effectiveness may be improved when the vacuum system is turned off by closing the eductor ball valve (#74). However, the vacuum system must be turned back on to read the differential pressure.

NOTICE

If pulsing does not reduce the differential pressure below 10-12 in. w.g. remove the filter and for a thorough mechanical cleaning. Or replacing the filter is recommended.

8.17.2. Vacuum method

An alternate cleaning method to utilize is vacuuming. A commercial duty vacuum cleaner is recommended, but a common household type may also be used. Vacuum the exterior (outside diameter) surface of the filter. This procedure will remove a significant amount of the large particles and surface contaminants that have accumulated and may be adequate second method after pulse cleaning of the filter. If necessary, this step should be performed after pulsing and prior to progressing to washing method (polyester filters only).

8.17.3. 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: The standard MiniBRS filter is polyester element material. 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.

8.17.4. Visual Inspection

A simple method but necessary method of inspection is to use a light bulb or flashlight. 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. Remove filter (#30) to allow thorough filter visual inspection. Visual inspection is completed after the previous filter cleaning methods have been applied. Replace filter if damage is detected.

8.18. ***Pneumatic Vacuum System:*** The vacuum system eductor requires no maintenance. The air hose and air supply ball valve (#74) should be inspected daily for wear, dry rotting, cracking or air leaks. Repair or replace hoses or components that show any signs of wear, air leaks, or other damage.

Damaged hoses and/or piping components can cause system malfunctions and can rupture resulting in serious injury or death to operating personnel.

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

8.20. ***Control Air Filter and Strainer:*** Once a day with the air supply on, completely open the control air filter (#2) drain valve (#3) to purge all moisture and debris. On electric units also purge the control air strainer. Purge each for about one minute then close the drain valve(s).

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8.21. *Maintenance Schedules Quick Reference Charts*

Note: The below schedule is the minimum requirements for inspection and maintenance; however, the equipment should be inspected and serviced immediately if abnormal operation is detected.

ITEM	MAINTENANCE REQUIRED	DAILY	WEEKLY	MONTHLY	QUARTERLY
Blaster Vessel	Hydrostatic Test. See Section 8.1	As required by state law and/or local authorities			
Blaster Vessel	Check for exterior damage (corrosion, dents, bulges). See Section 8.2		X		
Blaster Vessel	Check for interior damage (corrosion / pitting). See Section 8.3				X
Popup	Check sealing surfaces, alignment and gasket to popup gap. See Section 8.4		X		
Blast & Air Hoses	Check hoses for soft spots, wear, cracks, or air leaks. See Section 8.6	X			
Remote Control Hoses	Check hoses for soft spots, wear, cracks, or air leaks. See Section 8.6	X			
Blaster Piping & Pipe Fittings	Check pipe & pipe fittings for wear, cracks, or air leaks. See Section 8.6	X			
Remote Control Wires	Check wiring for bare spots, fraying, or cracks. See Section 8.6	X			
Blast & Air Hose Couplings	Check for safety pins and whip checks. See Section 8.7	X			
Hose Coupling Gaskets	Check for leaky air and blast hose coupling gaskets. See Section 8.8	X			
Blast Nozzle	Check blast nozzle threads and jacket condition. Check for air leaks. See Section 8.9	X			
Valves	With valves off and blast vessel pressurized check for air leakage at blast nozzle. See Section 8.10	X			
Valves	Disassemble, inspect, and lubricate. See Section 8.10				X
Personal Protective Equipment	Check for presence and condition of all personal protective equipment. See Section 3.10 and 8.11	X			
Warning Decals	Check the condition of warning decals. See Sections 0.0 and 8.12			X	
Combo Blowdown	Check condition of blowdown hose. See Section 8.13		X		
Reclaimer Screen	Clean trash from abrasive screen and airwash. See Section 8.14	X			
Cyclone Dust Bin	Empty dust in secondary cyclone dust bin. See Section 8.15	X			
Dust Collector	Clean dust buildup in dust collector. See Section 8.16		X		
Dust Collector Air Filter	Clean and inspect dust collector filters. See Section 8.17	Clean as required per operating conditions.			
Vacuum System	Check hoses for soft spots, wear, cracks, or air leaks See Section 8.18	X			
Handway Assembly	Check condition of gasket and sealing surfaces. See Sections 8.19 and 6.3.			X	
Control Air Filter & Strainer	Fully open the air filter and strainer drain valve to purge moisture and debris. See Section 8.20.	X			

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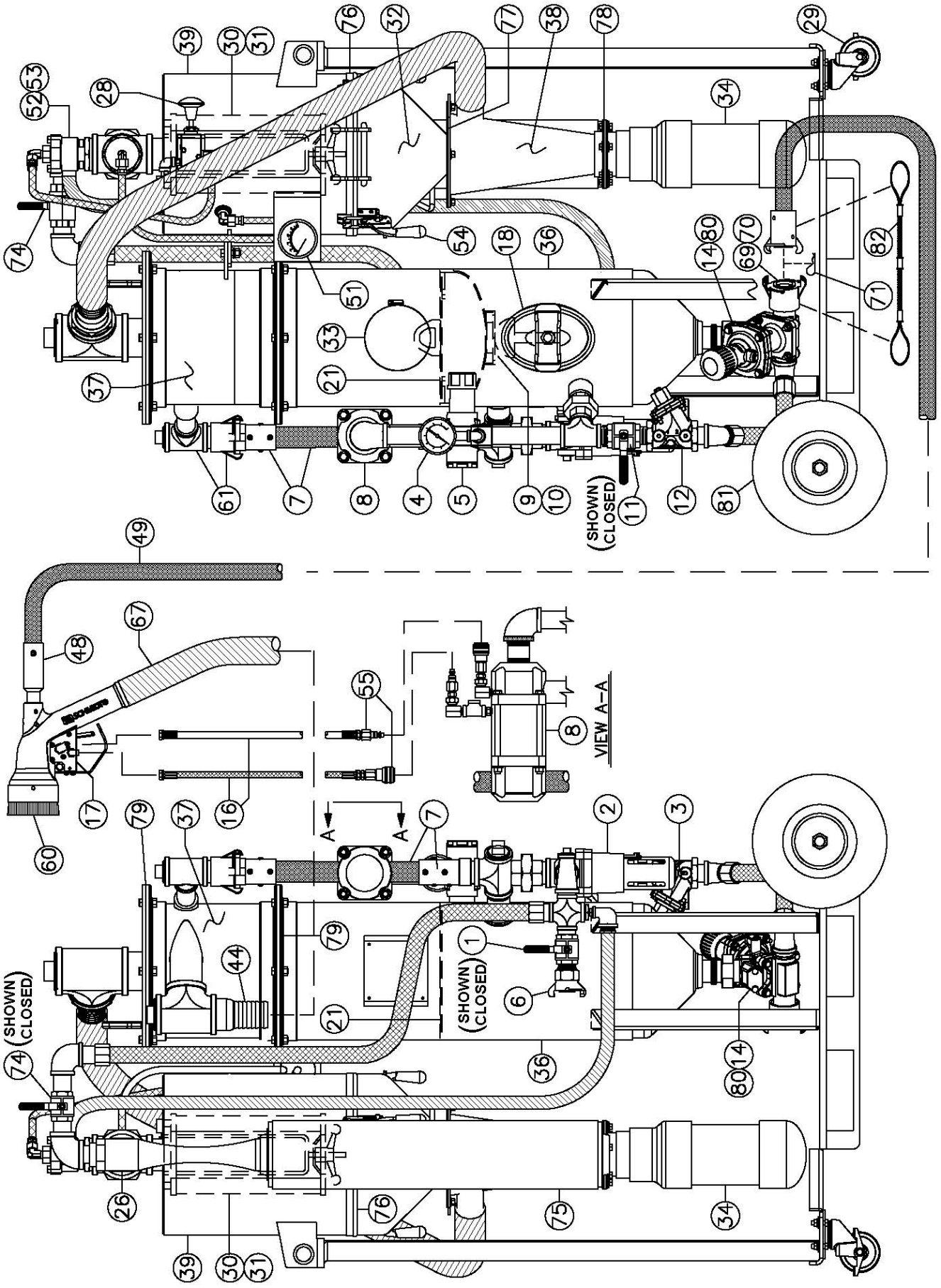
9.0 Drawings and Parts Lists

The following pages contain drawings representing typical blast control systems and components. Determine the type of control system the abrasive blast system is equipped with (pneumatic or electric controls) then reference the appropriate drawing and parts list to determine the required parts. To assure the proper operation of the blast system only use Schmidt® original factory replacement parts furnished by an authorized Schmidt distributor. See Section 1.39 and Section 12.2.12.

9.1(a) MiniBRS™ Abrasive Blaster



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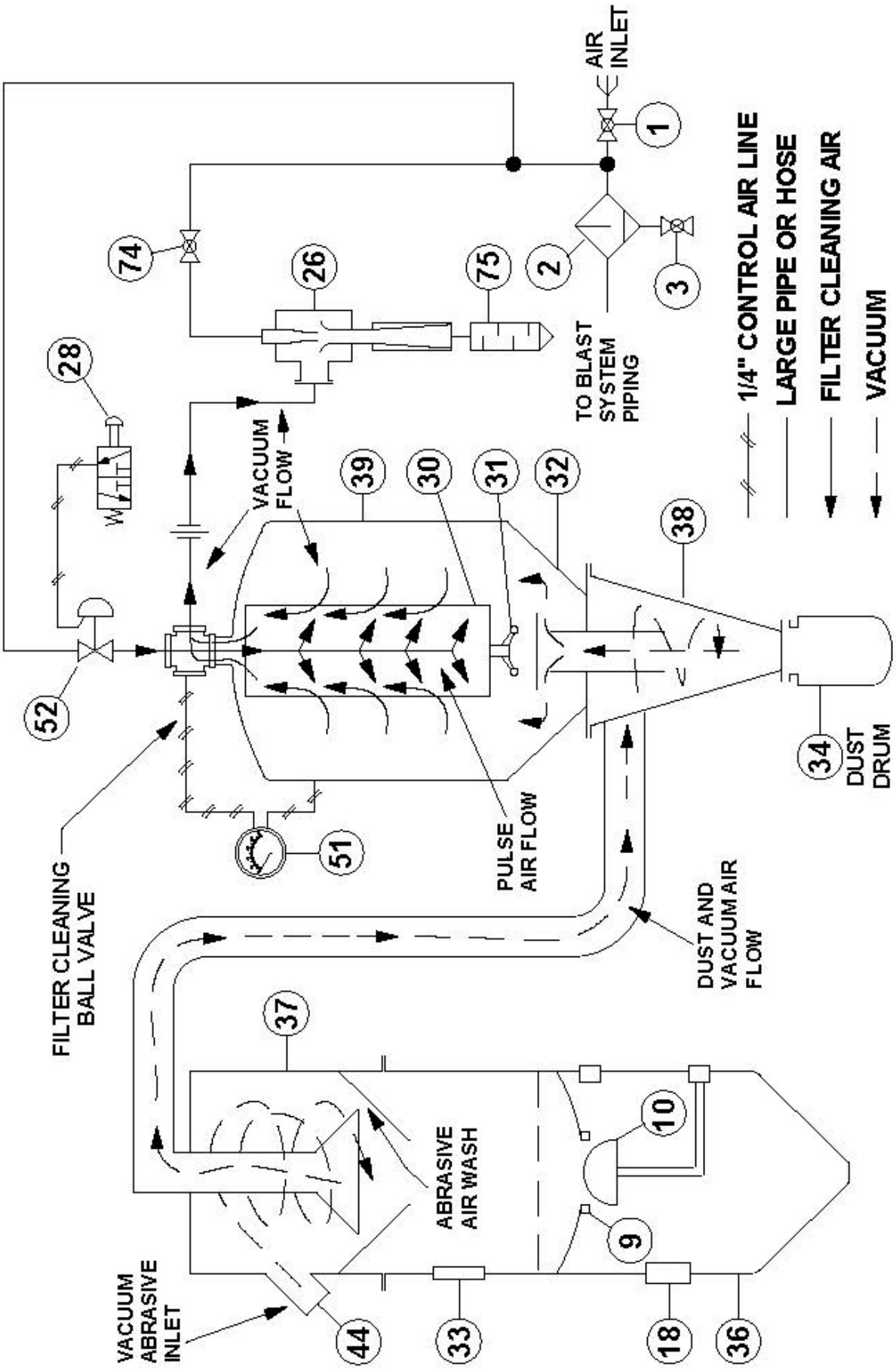
9.1(b) MiniBRS™ Abrasive Blast System Parts List

Item	Part Number	Description
1	2401-506	Full-port ball valve 1" (Air inlet Valve)
2	2302-206-05	Air filter 1"
3	------	Air filter drain valve
4	2010-009-01	Pressure gauge 0-160 PSI
5	2003-006	Regulator 1" Non-relieving
6	4208-106	2-Lug Crowfoot, 1"
7	4115-005	Blowdown hose assembly
	4105-005	Blast hose, 3/4" (per foot)
	4215-405	Nozzle holder, 3/4"
	4214-407	Hose coupling, 3/4"
8	2223-000	Combo Valve 1-1/4"
9	2100-001	Pop-up Gasket
10	2100-000	Pop-up head w/stem
11	2401-506	Full-port ball valve 1" (Choke valve)
12	2123-106	Automatic air valve 1"
14	2130-006	TeraValve, TC 1" (See Section 9.5)
15	2229-100	Electric control valve, 12vdc (electric units)
	2229-102	Electric control valve, 24vdc (electric units)
	7112-000	Power tee, 12vdc w/coil (electric units)
	7112-010	Power tee, 24vdc w/coil (electric units)
16	4100-301	Twinline hose 27.5'
	7074-025	Extension cord 25' (Electric units)
17	2263-004-20	G2 Trigger module (pneumatic)
	2263-404-20	G2 Trigger module (electric)
	2263-002	G2 Deadman (pneumatic)
	2263-402-01	G2E Deadman (electric w/ plug)
18	7000-000-11	4 X 6 Handway crab assembly
	7000-000-06	4 X 6 Handway gasket
21	8033-000-63	Reclaimer screen (standard 1/8" mesh)
	8033-000-41	Reclaimer screen (optional 3/16" mesh)
26	2015-209-01	Eductor body 2"
	2015-079-02	Eductor nozzle, 75 SCFM
	2015-109-02	Eductor nozzle, 100 SCFM (optional)
28	8033-000-93	Pulse Control Valve
29	7048-011-01	Caster wheel w/ brake (3-1/2")
30	8033-000-01	Dry filter, 6" (polyester)
31	8031-001-11	Filter knob
32	------	Dust collector access cover (removable)
33	8033-000-28	Reclaimer hopper access cover (rubber)
34	8033-000-23	Cyclone dust bin

Item	Part Number	Description
36	8033-030-11P	MiniBRS 0.46 C.F. Blast Vessel
37	8033-030-18P	Airwash cyclone reclaimer
38	8033-030-07P	Secondary cyclone
39	8033-030-12P	Dust collector, Style II
	8033-030-02P	Dust collector, Style I
44	4212-009	KC nipple 2"
48	8033-000-09	Workhead nozzle #3 (Standard)
	8033-000-10	Workhead nozzle #4 (Optional)
49	8033-000-31	Blast hose assembly 25' (excludes nozzle/adapter)
51	2010-058	Differential pressure gauge 0-20" W.C.
52	8032-000-66	Pulse valve, 3/4"
53	8033-000-98	Pulse air nozzle
54	8033-000-128	Dust collector cover latch, Style II
	8400-421-01	Dust collector cover latch Style I
55	4224-300-02	Quick connect plug 1/4"
	4224-301-02	Quick connect socket 1/4"
	7109-301	Electric plug twist lock (Electric units)
	7109-300	Electric connector twist lock (Electric units)
60	8033-000-80	Vacuum workhead complete (#3) See Section 9.9
61	8408-000-78	Air flow restrictor nipple, 1-14" x close
	3038-007-06	Reducing run tee, 1-1/4" x 1"
	3014-007	Pipe plug, 1-1/4"
	3029-006-11	Pipe nipple, 1" x 3"
66	2013-402	Dust elminator 1/4" (Electric units)
67	4107-009	Vacuum hose 2"
69	4214-108	1-1/2 Threaded coupling
70	4214-999	Coupling gasket
71	7119-002	Safety pin
74	2401-506	Full-port ball valve 1" (Vacuum On & Off)
75	2011-009-03	2" Exhaust muffler
76	8033-000-130	Gasket, dust col. to cover (Style II - edge trim)
	8033-000-94	Gasket, dust col. to cover (Style I - flat neoprene)
77	8033-000-06	Gasket, cover to cyclone
78	8033-000-76	Gasket, cyclone to dust bin
79	7003-110-01	Gasket, 10" angle flange
80	2509-002	Quick exhaust valve, 1/4"
81	7046-003	Wheel & tire, 3 bag
	7040-003	Axle, 3/4" x 22-3/8"
	7019-519	Nylock nut, 3/4"
82	8710-80558	Hose whip check (1/8" x 20")

9.2(a) MiniBRS Abrasive Blaster Pneumatic Schematic



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9.2(b) MiniBRS™ Abrasive Blast System Parts List

Item	Part Number	Description
1	2401-506	Full-port ball valve 1" (Air inlet Valve)
2	2302-206-05	Air filter 1"
3	------	Air filter drain valve
4	2010-009-01	Pressure gauge 0-160 PSI
5	2003-006	Regulator 1" Non-relieving
6	4208-106	2-Lug Crowfoot, 1"
7	4115-005	Blowdown hose assembly
	4105-005	Blast hose, 3/4" (per foot)
	4215-405	Nozzle holder, 3/4"
	4214-407	Hose coupling, 3/4"
8	2223-000	Combo Valve 1-1/4"
9	2100-001	Pop-up Gasket
10	2100-000	Pop-up head w/stem
11	2401-506	Full-port ball valve 1" (Choke valve)
12	2123-106	Automatic air valve 1"
14	2130-006	TeraValve, TC 1" (See Section 9.5)
15	2229-100	Electric control valve, 12vdc (electric units)
	2229-102	Electric control valve, 24vdc (electric units)
	7112-000	Power tee, 12vdc w/coil (electric units)
	7112-010	Power tee, 24vdc w/coil (electric units)
16	4100-301	Twinline hose 27.5'
	7074-025	Extension cord 25' (Electric units)
17	2263-004-20	G2 Trigger module (pneumatic)
	2263-404-20	G2 Trigger module (electric)
	2263-002	G2 Deadman (pneumatic)
	2263-402-01	G2E Deadman (electric w/ plug)
18	7000-000-11	4 X 6 Handway crab assembly
	7000-000-06	4 X 6 Handway gasket
21	8033-000-63	Reclaimer screen (standard 1/8" mesh)
	8033-000-41	Reclaimer screen (optional 3/16" mesh)
26	2015-209-01	Eductor body 2"
	2015-079-02	Eductor nozzle, 75 SCFM
	2015-109-02	Eductor nozzle, 100 SCFM (optional)
28	8033-000-93	Pulse Control Valve
29	7048-011-01	Caster wheel w/ brake (3-1/2")
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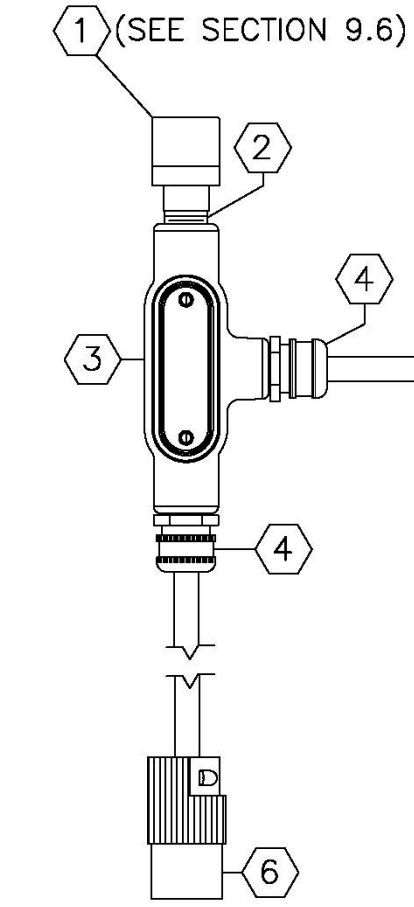
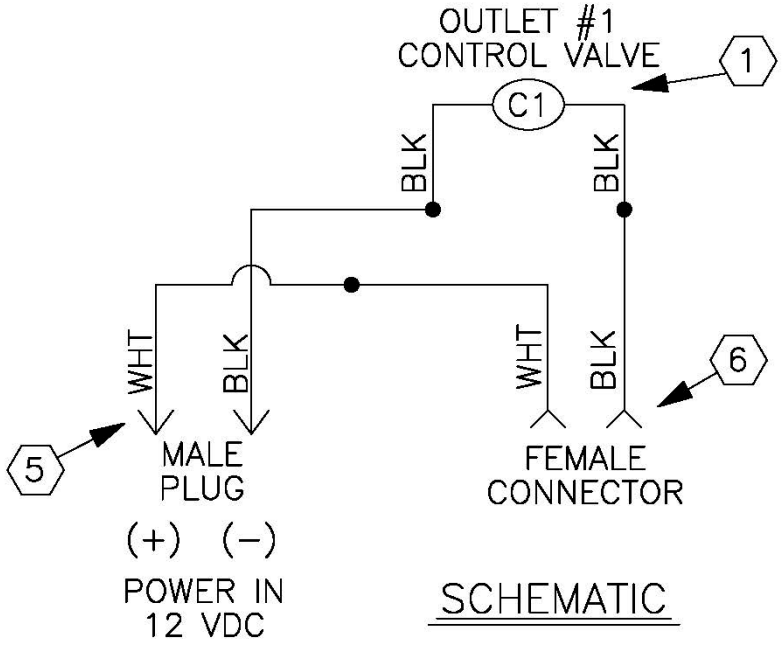
31	8031-001-11	Filter knob
32	------	Dust collector access cover (removable)
33	8033-000-28	Reclaimer hopper access cover (rubber)
34	8033-000-23	Cyclone dust bin
36	8033-030-11P	MiniBRS 0.46 C.F. Blast Vessel
37	8033-030-18P	Airwash cyclone reclaimer
38	8033-030-07P	Secondary cyclone
39	8033-030-12P	Dust collector, Style II
	8033-030-02P	Dust collector, Style I
44	4212-009	KC nipple 2"
48	8033-000-09	Workhead nozzle #3 (Standard)
	8033-000-10	Workhead nozzle #4 (Optional)
49	8033-000-31	Blast hose assembly 25' (excludes nozzle/adapter)
51	2010-058	Differential pressure gauge 0-20" W.C.
52	8032-000-66	Pulse valve, 3/4"
53	8033-000-98	Pulse air nozzle
54	8033-000-128	Dust collector cover latch, Style II
	8400-421-01	Dust collector cover latch Style I
55	4224-300-02	Quick connect plug 1/4"
	4224-301-02	Quick connect socket 1/4"
	7109-301	Electric plug twist lock (Electric units)
	7109-300	Electric connector twist lock (Electric units)
60	8033-000-80	Vacuum workhead complete (#3) See Section 9.9
61	8408-000-78	Air flow restrictor nipple, 1-14" x close
	3038-007-06	Reducing run tee, 1-1/4" x 1"
	3014-007	Pipe plug, 1-1/4"
	3029-006-11	Pipe nipple, 1" x 3"
66	2013-402	Dust elminator 1/4" (Electric units)
67	4107-009	Vacuum hose 2"
69	4214-108	1-1/2 Threaded coupling
70	4214-999	Coupling gasket
71	7119-002	Safety pin
74	2401-506	Full-port ball valve 1" (Vacuum On & Off)
75	2011-009-03	2" Exhaust muffler
76	8033-000-130	Gasket, dust col. to cover (Style II - edge trim)
	8033-000-94	Gasket, dust col. to cover (Style I - flat neoprene)
77	8033-000-06	Gasket, cover to cyclone
78	8033-000-76	Gasket, cyclone to dust bin
79	7003-110-01	Gasket, 10" angle flange
80	2509-002	Quick exhaust valve, 1/4"
81	7046-003	Wheel & tire, 3 bag
	7040-003	Axle, 3/4" x 22-3/8"
	7019-519	Nylock nut, 3/4"
82	8710-80558	Hose whip check (1/8" x 20")

9.3 Electrical Diagrams (Applicable to electric controls)

		7112-000	JUNCTION TEE ASSEMBLY, 12 VDC
		7112-010	JUNCTION TEE ASSEMBLY, 24 VDC
ITEM	QTY	PART NO.	DESCRIPTION
1	1	2229-100-03	COIL 12 VDC
		2229-102-03	COIL 12 VDC
2	1	3029-104-99	NIPPLE TBE, 1/2" x CLOSE
3	1	2025-100-07	TEE, 1/2" ALUM. CONDUIT BODY
–	1	2025-100-13	CONDUIT BODY OUTLET GASKET
–	1	2025-100-12	1/2" CONDUIT BODY COVER
4	2	7117-504	CGB CONNECTOR, 1/2"
5	1	7109-301-01	ELEC. PLUG, TW-LK 3-PRG W/16" CORD
6	1	7109-300-01	ELEC. CONN., TW-LK 3-PRG W/16" CORD



ASSEMBLY DETAIL



SCHEMATIC

NOTES
1) REMOVE COIL GREEN GROUND WIRE, IT IS NOT USED FOR 12VDC/24VDC (LOW VOLATAGE) APPLICATIONS.
2) BLACK CORD WIRES CONNECT TO GOLD TERMINAL, WHITE CORD WIRES CONNECT TO SILVER TERMINAL, AND GREEN CORD WIRES ARE NOT USED. NOTE: GREEN CORD WIRES ARE ONLY USED FOR ABRASIVE CUTOFF APPLICATIONS.
3) USE INSULATED BUTT SPLICE CONNECTORS FOR WIRE TO WIRE CONNECTIONS.
4) USE A SELF STRIPPING INSULATION DISPLACEMENT CONNECTORS FOR "T" CONNECTIONS.
5) TEST FINAL ASSEMBLY FOR CONTINUITY USING A MULTIMETER.

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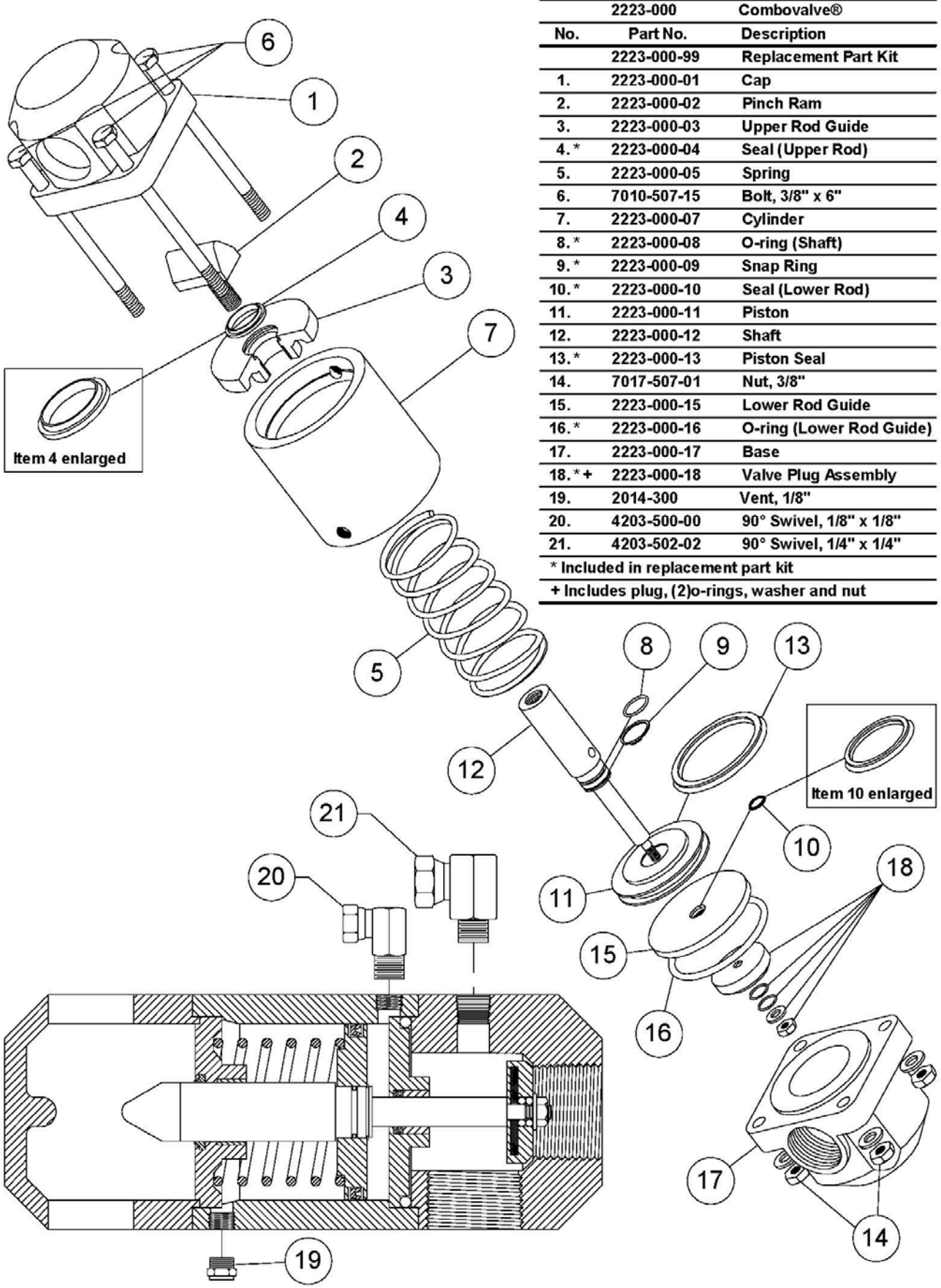
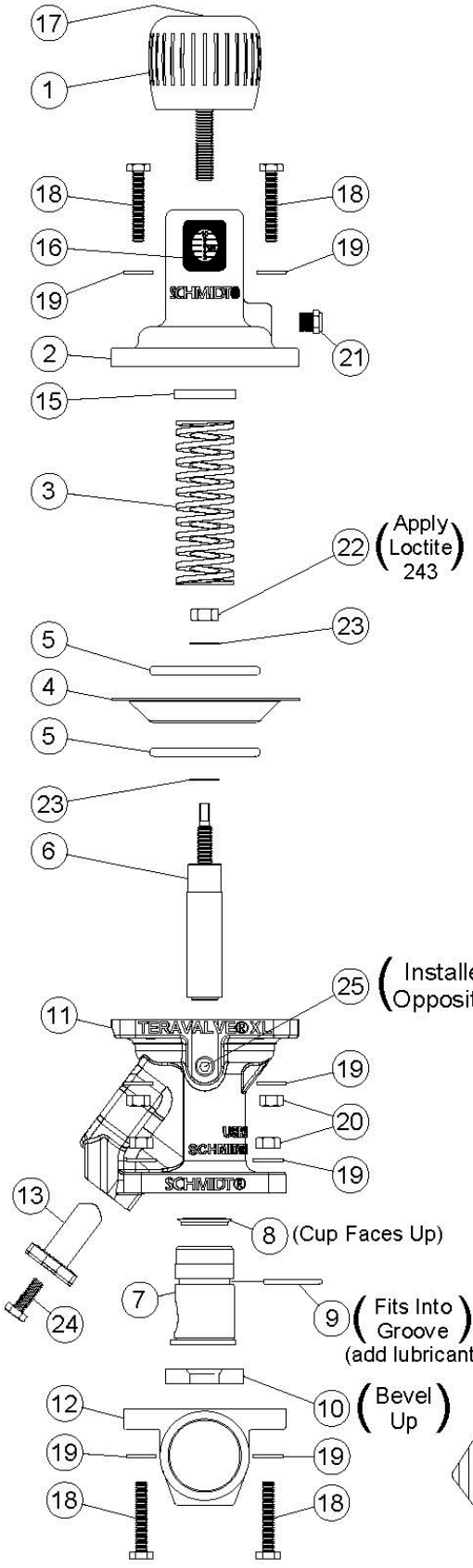
9.4 ComboValve®



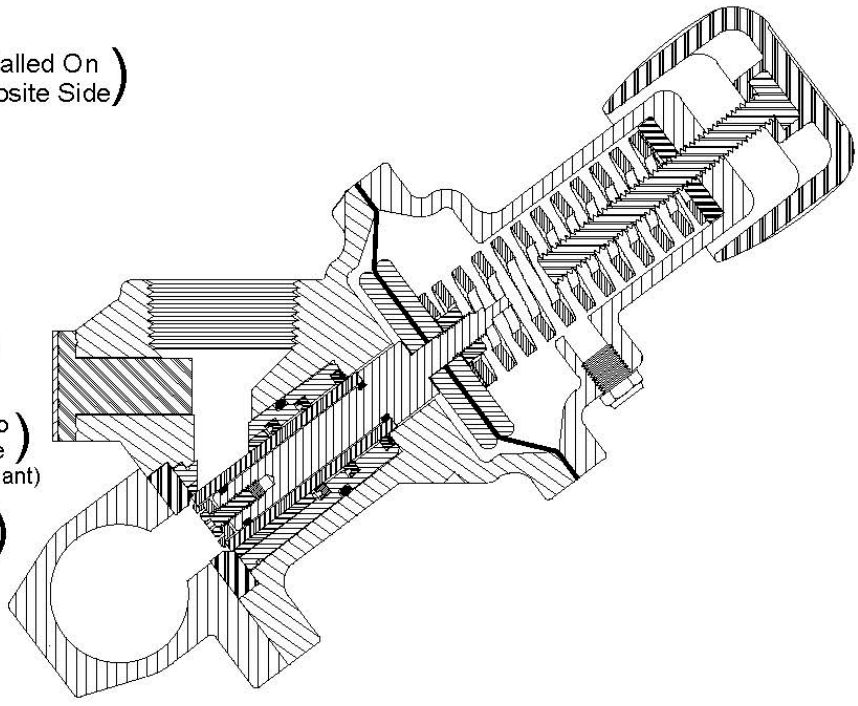
	2223-000	Combovalve®
No.	Part No.	Description
	2223-000-99	Replacement Part Kit
1.	2223-000-01	Cap
2.	2223-000-02	Pinch Ram
3.	2223-000-03	Upper Rod Guide
4.*	2223-000-04	Seal (Upper Rod)
5.	2223-000-05	Spring
6.	7010-507-15	Bolt, 3/8" x 6"
7.	2223-000-07	Cylinder
8.*	2223-000-08	O-ring (Shaft)
9.*	2223-000-09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

9.5 Tera Valve™ XL™



	2130-206	TeraValve™ XL™, Tungsten Carbide Slotted 1"
Item	Part No.	Description
1	2130-000-01	Knob
2	2130-000-02	Cap
*3	2130-000-03	Spring
‡4	2130-000-04	Diaphragm
5	2130-000-05	Diaphragm Plate
*6	2130-000-06	Tungsten Carbide Plunger
7	2130-200-07	Tungsten Carbide Sleeve (Incl. O-Ring & Internal Wipers)
‡8	2130-000-08	Plunger Seal
‡9	2130-000-09	Sleeve O-Ring
‡10	2130-000-10	Seat
11	2130-000-11	Body
12	2130-006-12	Base 1" x 1 1/4"
*13	2130-000-13	Cleanout Plug
15	2130-000-15	Vibration Disc
16	2130-000-16	Virtual Position Indicator Decal
17	2130-000-17	Knob Decal
18	7010-503-08	Hex Bolt, 1/4" UNC x 1 1/2" Lg.
19	7027-502-02	Flat Washer, 1/4" SAE
20	7017-503	Hex Nut, 1/4" UNC
21	2014-300	Breather Vent, 1/8"
22	7017-505	Hex Nut, 5/16" UNC
‡23	2123-009-01	Gasket
24	7010-503-04	Hex Bolt, 1/4" UNC x 1/2" Lg.
25	3032-100	Plug, 1/8"
* Included In Replacement Parts Kit (2130-000-99)		
+ Included In Replacement Parts Kit, Seals Only (2130-000-98)		

NOTE: Must remove cap (#2) for installation and removal on 1.5cf vessels.



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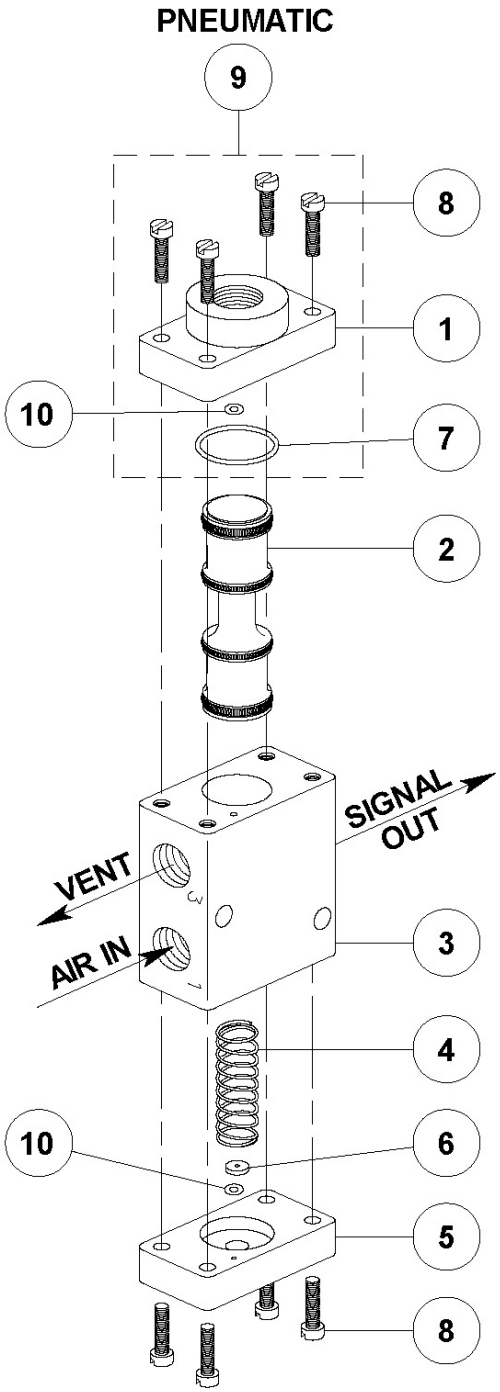
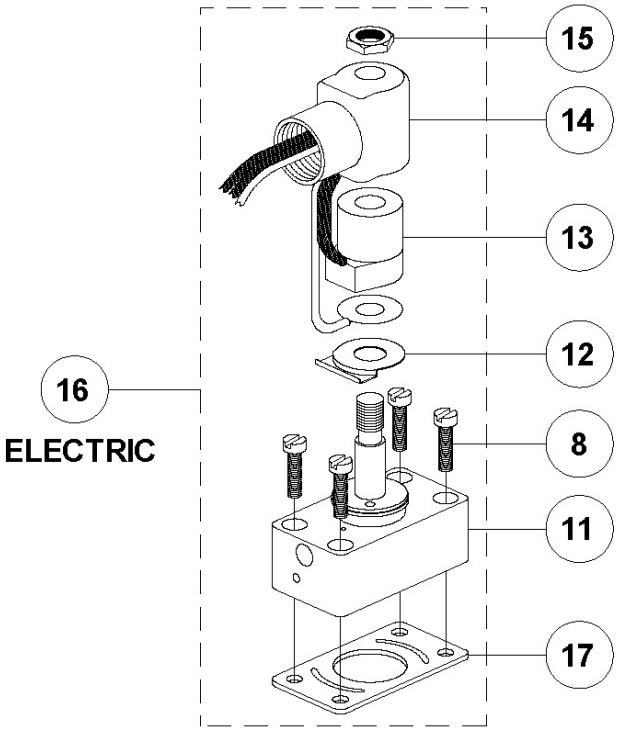
9.6 Control Valves (Applicable to electric controls)





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

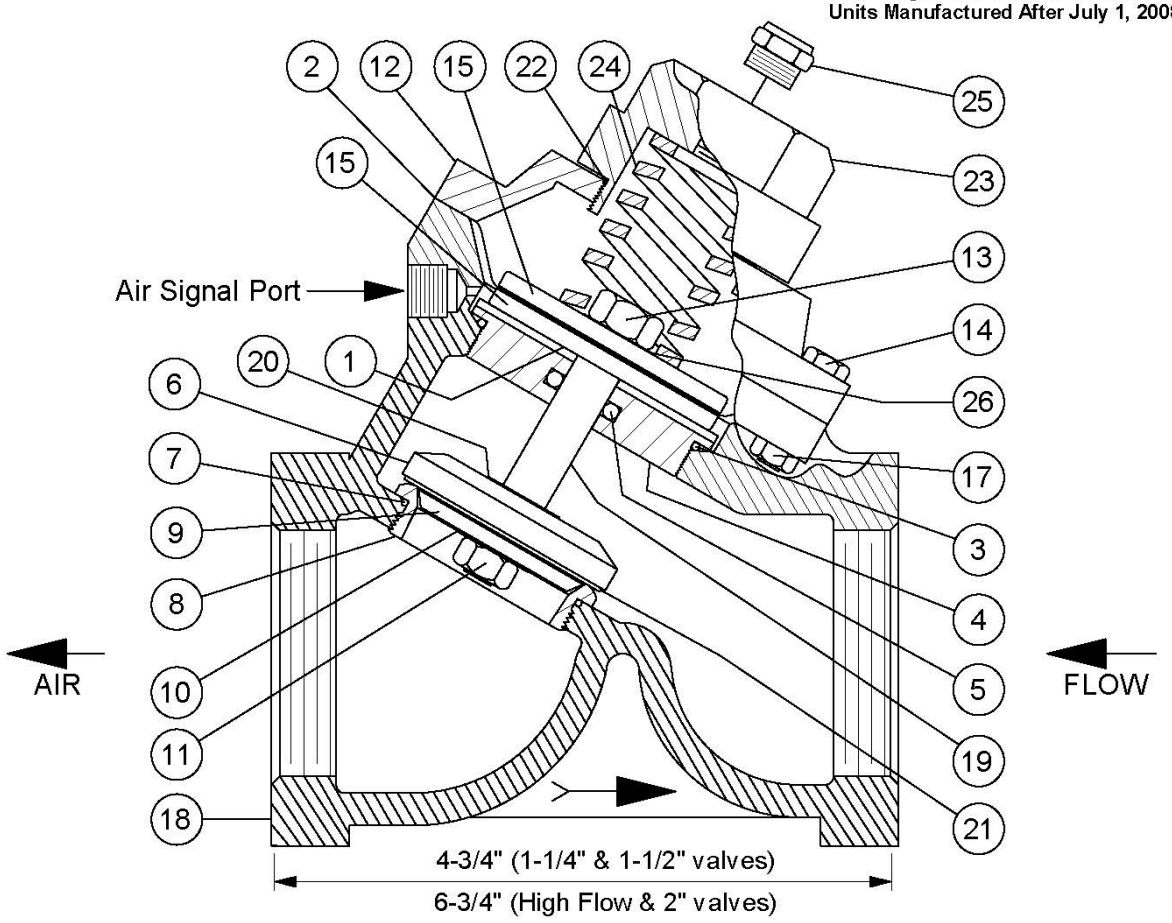
9.7 Automatic Air Valve (normally closed)

	2123-106	1" Valve
No.	Part No.	Description
	2123-006-99	Replacement Parts Kit
	2123-006-97	Hard 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		
+ Included In Hard Parts Replacement Kit		

	2123-107	1 1/4" Valve
	2123-108	1 1/2" Valve
No.	Part No.	Description
	2123-007-99	Replacement Parts Kit
	2123-007-97	Hard 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		
+ Included In Hard Parts Replacement Kit		

**	2123-108L	1-1/2" High Flow Valve
	2123-109	2" Valve
No.	Part No.	Description
	2123-009-99	Replacement Parts Kit
	2123-009-97	Hard 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		
+ Included In Hard Parts Replacement 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.

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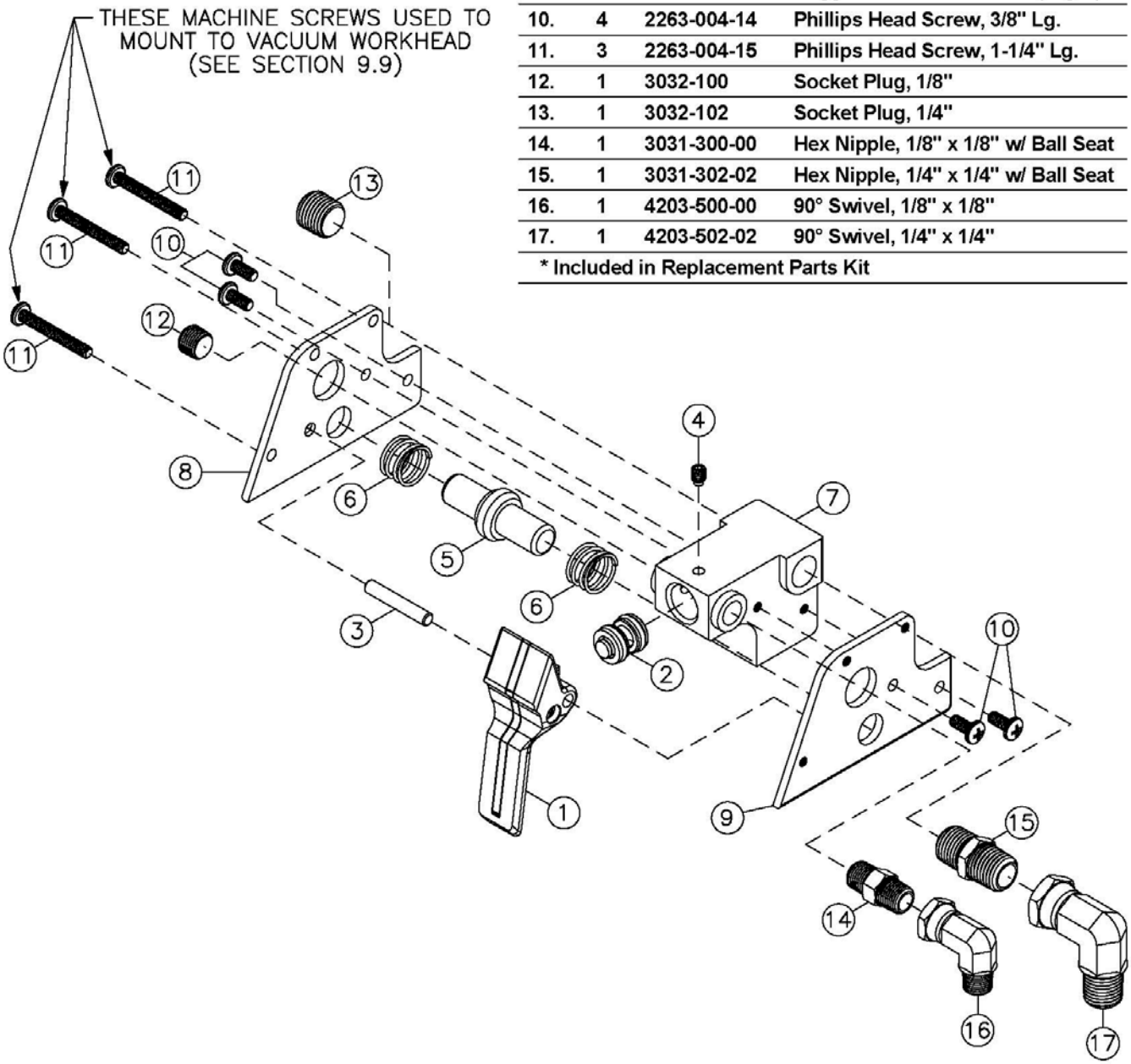
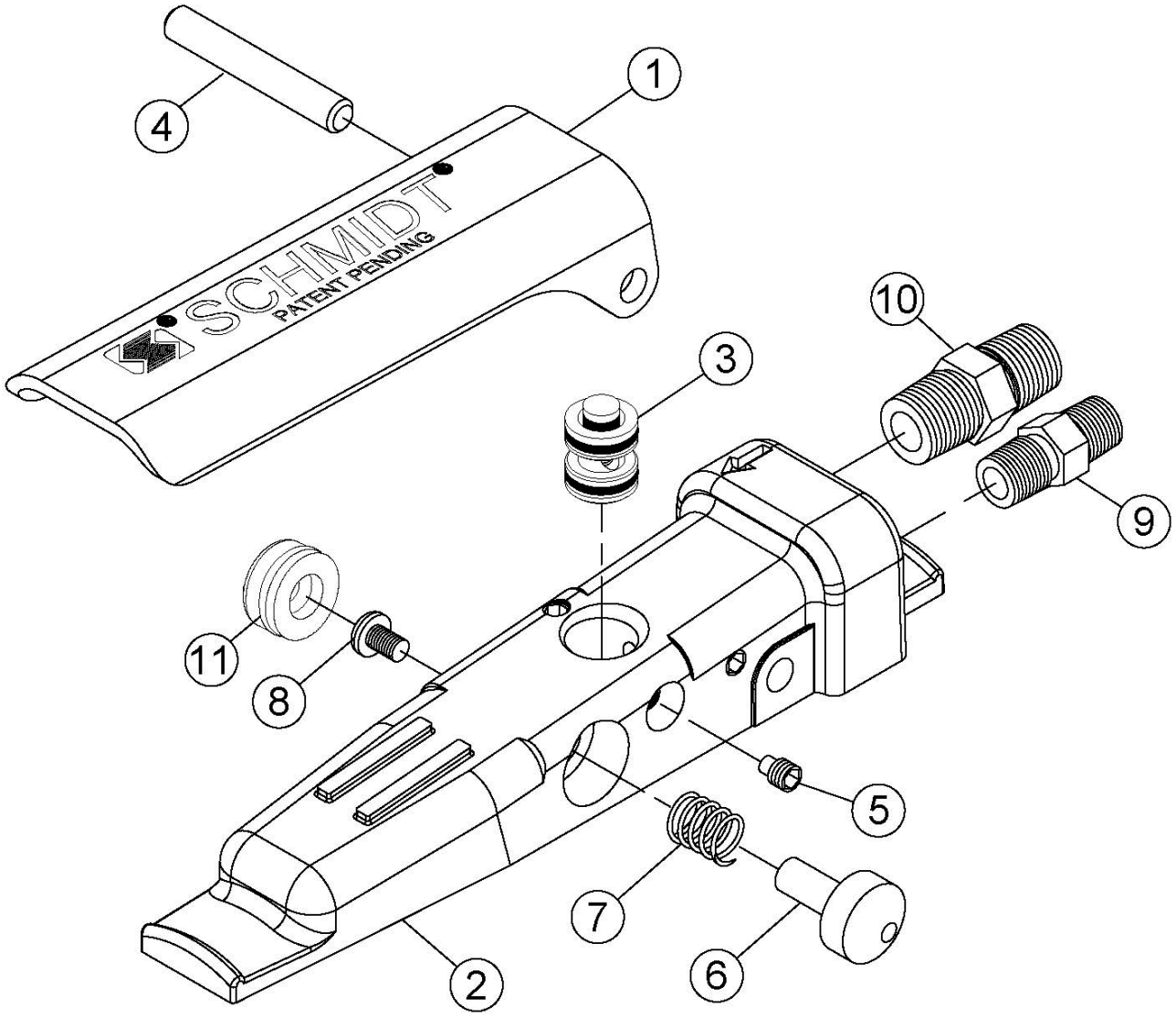
9.8(a) G2 Trigger Deadman Module (pneumatic)

2263-004-20		G2 Pneumatic Trigger Deadman Module	
No.	Qty.	Part No.	Description
		2263-004-99	Replacement Parts Kit
1.	1	2263-004-01	Deadman Trigger
2. *	1	2263-002-03	Deadman Cartridge Assembly
3.	1	2263-004-04	Deadman Trigger Hinge Pin
4. *	1	2263-004-05	Deadman Cartridge Set Screw
5.	1	2263-004-06	Deadman Trigger Safety Button
6. *	2	2263-004-07	Deadman Spring
7.	1	2263-004-11	Trigger Module Body
8.	1	2263-004-12	Trigger Module Side Plate (Left)
9.	1	2263-004-13	Trigger Module Side Plate (Right)
10.	4	2263-004-14	Phillips Head Screw, 3/8" Lg.
11.	3	2263-004-15	Phillips Head Screw, 1-1/4" Lg.
12.	1	3032-100	Socket Plug, 1/8"
13.	1	3032-102	Socket Plug, 1/4"
14.	1	3031-300-00	Hex Nipple, 1/8" x 1/8" w/ Ball Seat
15.	1	3031-302-02	Hex Nipple, 1/4" x 1/4" w/ Ball Seat
16.	1	4203-500-00	90° Swivel, 1/8" x 1/8"
17.	1	4203-502-02	90° Swivel, 1/4" x 1/4"
* Included in Replacement Parts Kit			



9.8(b) G2 Deadman Valve (pneumatic)

	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		



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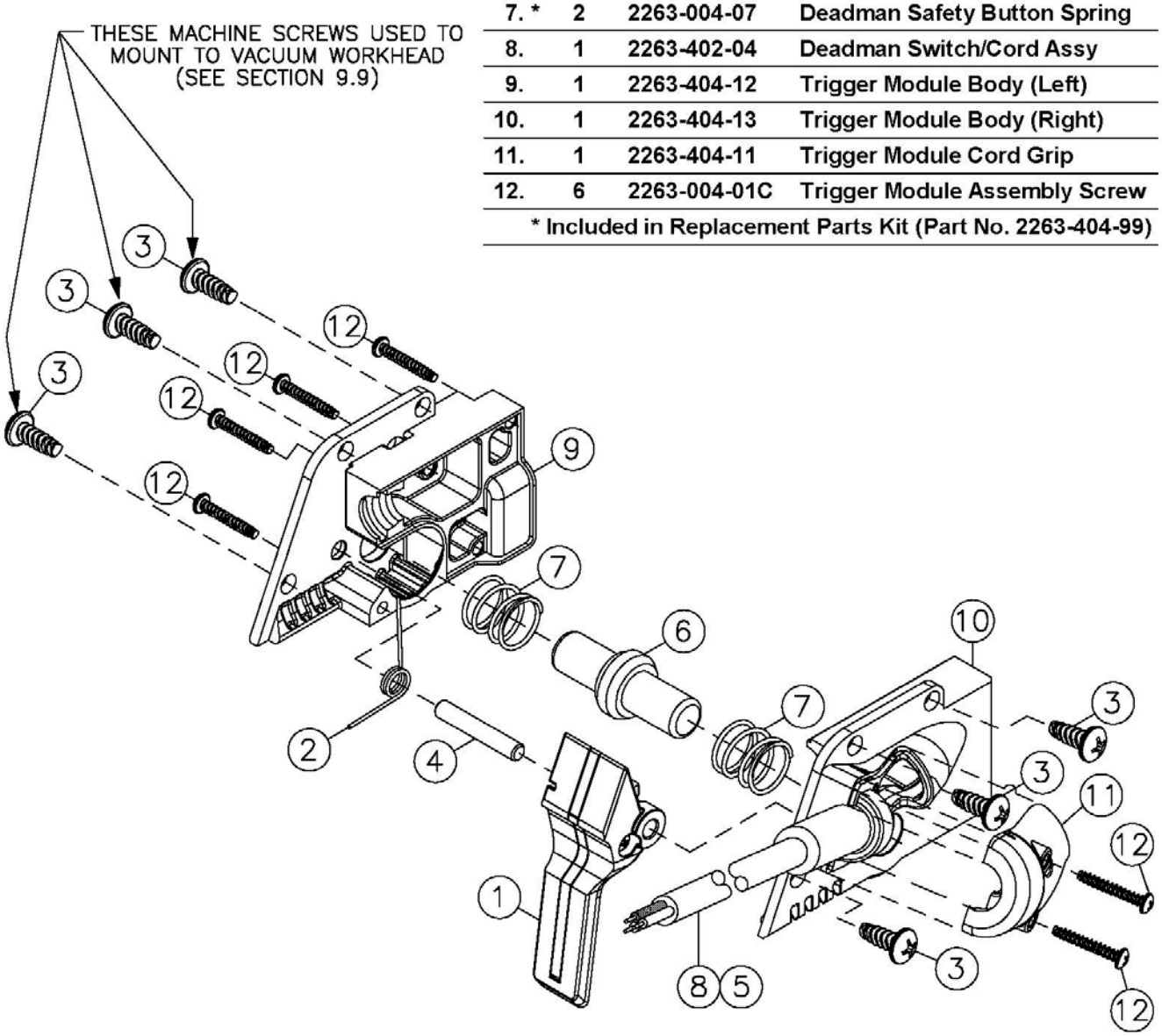
9.8(c) G2E Trigger Deadman Module (electric)

2263-404-20 G2 Electric Trigger Deadman Module			
No.	Qty.	Part No.	Description
1.	1	2263-004-01	Deadman Trigger
2. *	1	2263-004-16	Deadman Trigger Spring
3.	6	2263-004-17	Phillips Head Screw, 1/2" Lg.
4.	1	2263-004-04	Deadman Trigger Pin
5.	1	2263-402-14	Electric Dust Cover
6.	1	2263-004-06	Deadman Trigger Safety Button
7. *	2	2263-004-07	Deadman Safety Button Spring
8.	1	2263-402-04	Deadman Switch/Cord Assy
9.	1	2263-404-12	Trigger Module Body (Left)
10.	1	2263-404-13	Trigger Module Body (Right)
11.	1	2263-404-11	Trigger Module Cord Grip
12.	6	2263-004-01C	Trigger Module Assembly Screw
* Included in Replacement Parts Kit (Part No. 2263-404-99)			

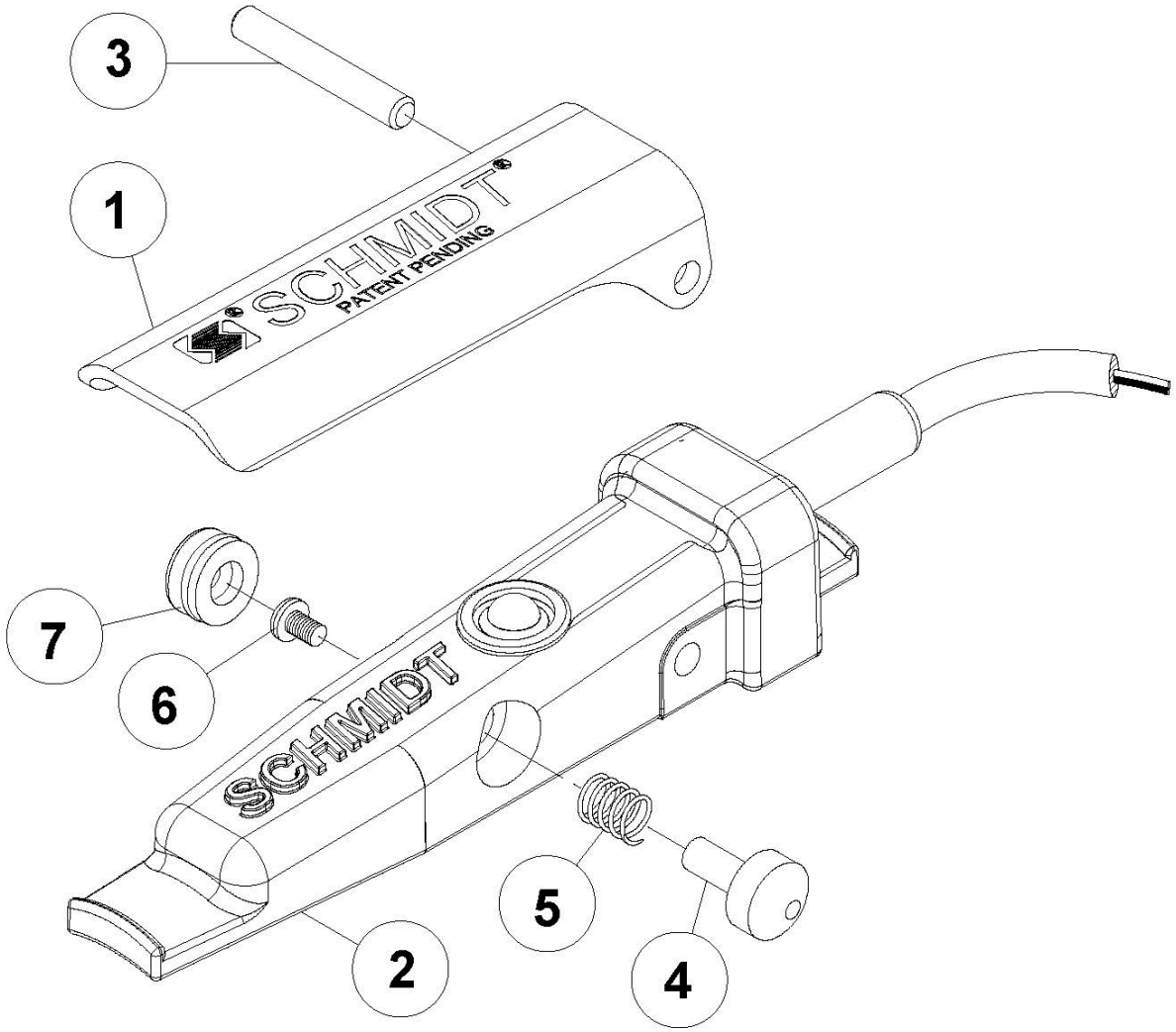


⚠ WARNING

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

9.8(d) G2E Electric Deadman Switch

	2263-402	G2E 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).

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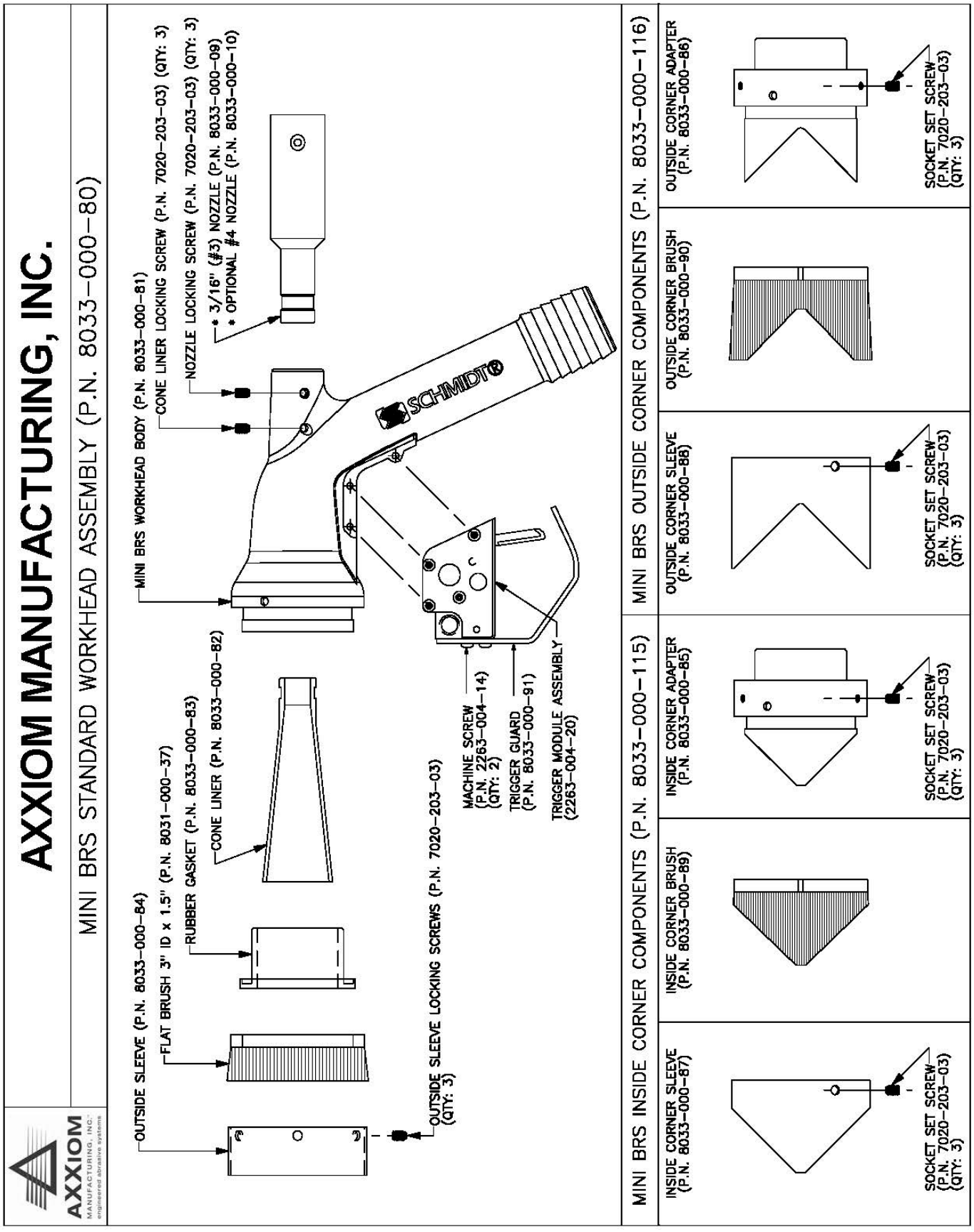
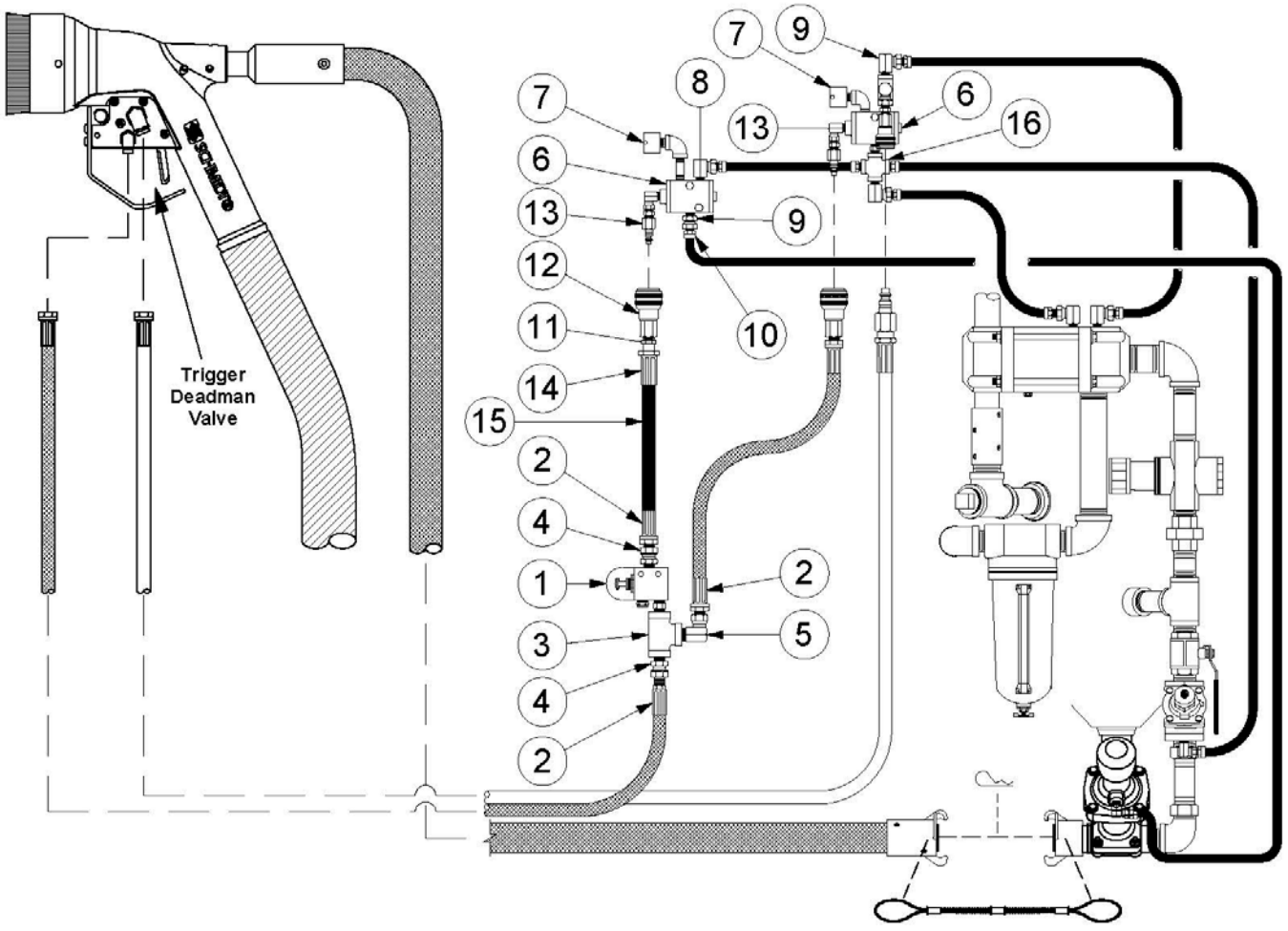
9.9 G2 Trigger Vacuum Workhead



9.10 Remote Abrasive Cut-off - Pneumatic (optional) (p.n. 2035-001-02)

No.	Part No.	Description
1	2025-010	Abrasive Cutoff Switch
	2025-100-01	Toggle Switch Guard
	2014-300	Breather Vent, Brass 1/8"
	3031-300-00	Hex Nipple 1/8" X 1/8"
2	4204-301-00	Hose Insert, Rigid 3/16" x 1/8" Brass
3	3011-100	Tee, Galv 1/8"
4	4201-500-00	Strait Swival, 1/8"M x 1/8"F
5	4203-500-00	Swivel 90°, 1/8" M x 1/8" F
6	2229-000	Control Valve - Normally Open
7	3029-102-09	Nipple TBE, Galv 1/4" x 2"
	3000-102	Elbow 90°, Galv. 1/4"
	2013-402	Dust Eliminator 1/4" MNPT
8	4203-502-02	Swivel 90°, 1/4"M x 1/4"F
9	4200-502-02	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	3016-102	Cross 1/4" Galv.

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



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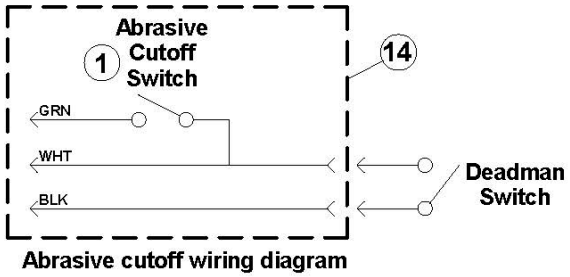
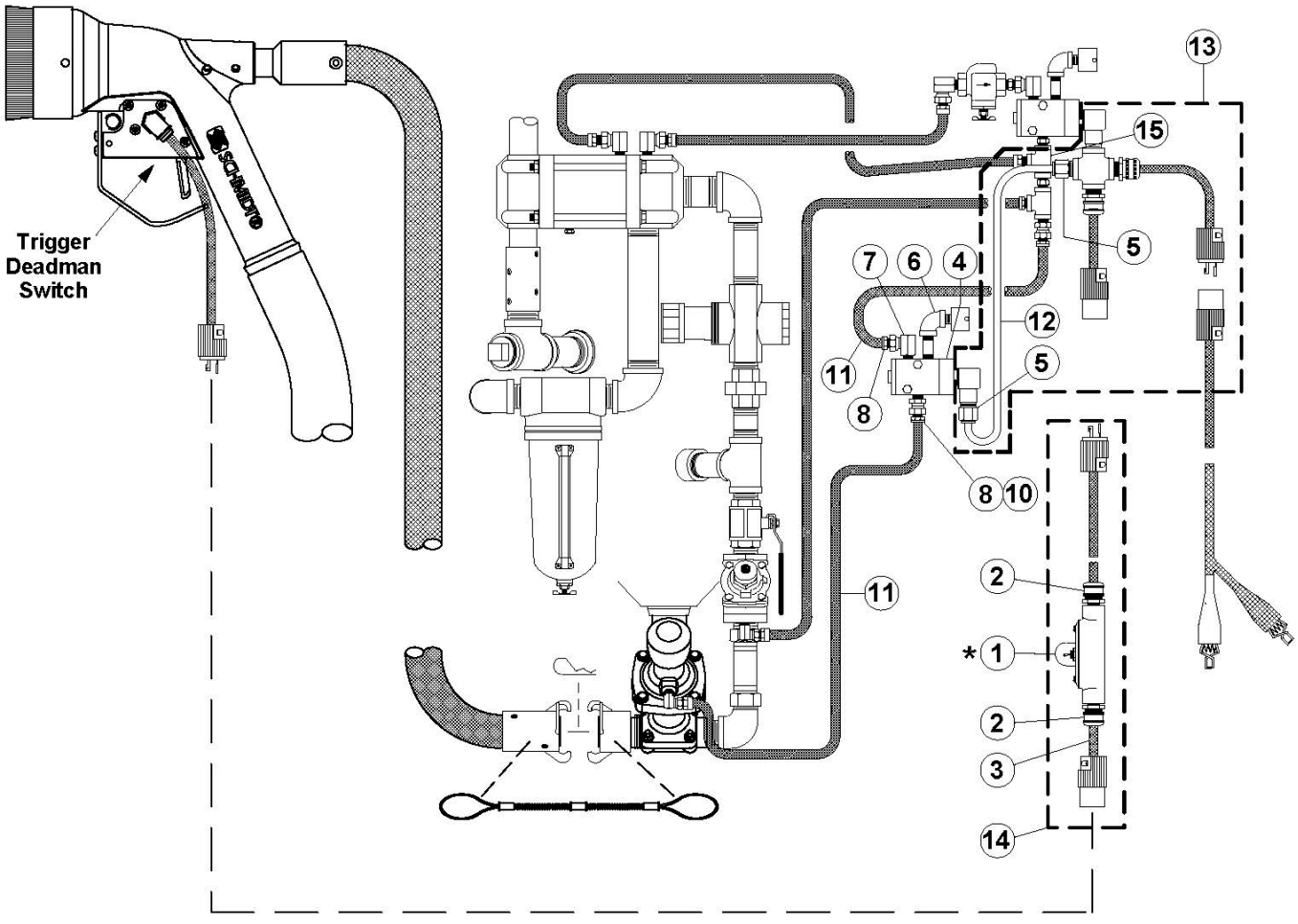
9.11 Remote Abrasive Cut-off – Electric (optional) (p.n. 2035-001-02)

	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



Abrasive cutoff wiring diagram



10.0 Recommended Spare Parts Lists

Spare Parts for Pneumatic and Electric Systems (see note below)

ITEM	QTY	PART #	DESCRIPTION
12	1	2123-006-02	1" Automatic Air Valve Diaphragm
12	2	2123-006-99	1" Automatic Air Valve Replacement Part Kit
12	1	2123-106	1" Automatic Air Valve
12	2	2123-106-24	1" Auto Air Valve Spring
12	2	2014-300	Breather Vent, 1/8"
14	1	2130-000-03	Tera Valve™ XL™ Spring
14	1	2130-000-11	Tera Valve XL Body
14	1	2130-000-12	Tera Valve XL Base, 1" x 1-1/4"
14	2	2130-000-98	Tera Valve XL Replacement Parts Soft Kit
14	1	2130-000-99	Tera Valve XL Replacement Parts Kit
1,11,74	1	2401-506	1 "Ball Valve (see Section 9)
18	1	7000-000-06	Handway Gasket, 4" x 6"
70	4	4214-999	Hose Coupling Gasket
N/A	4	4205-106-99	1" Air Hose Swivel Gasket
71	8	7119-002	Safety Pin, Air/Blast Hose Coupling
8	1	2223-999	ComboValve® replacement parts kit
8	1	2223-000-18	ComboValve plug assembly
7	1	4115-005	Blowdown Hose Assy, 3/4" x 18"
7	20ft	4105-005	Blowdown (blast) Hose, 3/4"
30	2	8033-000-01	MiniBRS™ Dust Collector Filter (Spun Bond Polyester)
48	1	8033-000-09	MiniBRS Workhead Blast Nozzle #3 (Standard)
48	1	8033-000-10	MiniBRS Workhead Blast Nozzle #4 (optional)
60	1	8033-000-81	MiniBRS Workhead Body
60	1	8033-000-82	MiniBRS Workhead Cone Liner
60	3	8033-000-83	MiniBRS Workhead Rubber Gasket
60	2	8033-000-14	MiniBRS Workhead Outer Sleeve
60	10	8033-000-15	MiniBRS Workhead Flatt Brush (Standard)
60	10	8033-000-16	MiniBRS Workhead Outside Corner Brush (optional)
60	10	8033-000-18	MiniBRS Workhead Inside Corner Brush (optional)
-	1	7031-999-30	Decal Kit MiniBRS

Spare Parts for Pneumatic Units Only (see note below)

16	1	4100-301	Twinline Hose, 27.5'
17	1	2263-004-20	G2 Trigger Deadman Module (pneumatic)
17	1	2263-004-99	Replacement Parts Kit, G2 Trigger Deadman Module (pneumatic)
55	2	4224-300-02	Quick Disconnect Plug, 1/4"
55	2	4224-301-02	Quick Disconnect Socket, 1/4"

Spare Parts for Electric Units Only (see note below)

15	1	2229-10X	Electric Control Valve (specify voltage)
15	1	2229-10X-03	Control Valve Coil (specify voltage)
16	1	7074-025	Extension Cord, 25'
17	1	2263-404-20	G2E Trigger Deadman Module (electric)
17	1	2263-404-99	Replacement Parts Kit, G2E Trigger Deadman Module (electric)
55	2	7109-301	Electric Plug, Twist Lock 3-Prong
55	2	7109-300	Electric Connector, Twist Lock 3-Prong
66	1	2013-402	Dust Eliminator, 1/4"

NOTE: Determine the type of blast controls on the abrasive blaster (either electric or pneumatic). Then, the required list of spare parts is List "A" plus either List "B" or "C". Example: If your abrasive blaster has pneumatic controls then the recommended spare parts you need are those items included in Lists "A" and "B". For blasters with special options refer to supplemental drawing(s) included with this operation and maintenance manual.

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11.0 Troubleshooting

This section lists probable causes of problems that may occur during operation of the abrasive blaster. Not all the "probable causes" may apply to your 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 MiniBRS™ 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 TeraValve™ XL™ (#10) prevents closing.
(2) Defective valve plunger in TeraValve™ (worn by abrasive or broken).
(3) Defective sleeve in TeraValve™ (worn by abrasive).
(4) Blocked air hose to TeraValve™ (trash blockage or pinched hose).
(5) Defective or broken spring in TeraValve™ (check length of spring).
(6) TeraValve™ 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 or broken spring in automatic air valve (#15).
(2) Defective seat in automatic air valve.
(3) Blocked signal air hose to automatic air valve.
(4) Defective O-ring in automatic air valve (around shaft).
(5) Obstruction inside automatic air valve (#15) binding shaft movement.
(6) Control valve stuck in the "ON" position (electric units only)

11.1.3. Both blast air and abrasive will not shut off

(1) Twinline hoses to deadman valve (#24) are crossed.
(2) Non-Schmidt deadman (#24) has been installed
(3) Control valve stuck in "ON" position (electric units only).
(4) Blocked twinline hose (#21).
(5) Defective deadman valve (#24). Pneumatic deadman cartridge plunger stuck in the "ON" position (down). Cartridge plunger is visible below deadman handle.
(6) Defective or broken ComboValve® spring. See Section 9.4.
(7) Defective ComboValve lower rod guide seal.

11.1.4. Blast outlet turns on accidentally

(1) The deadman lever (#24) is worn out.
(2) The safety button on the deadman is missing. See drawings in Section 9.8.
(3) A bleeder type deadman valve has been installed. A bleeder type deadman valve *is not safe* because a particle of dirt from the air hose can plug the bleed hole and cause the blast outlet to turn on. See *Warnings* and *Rules for Safer Operation* in Section 1.0.
(4) Defective electric deadman switch or electric wiring (check for an electric short).
(5) Defective ComboValve lower rod guide seal (ComboValve blasters only).

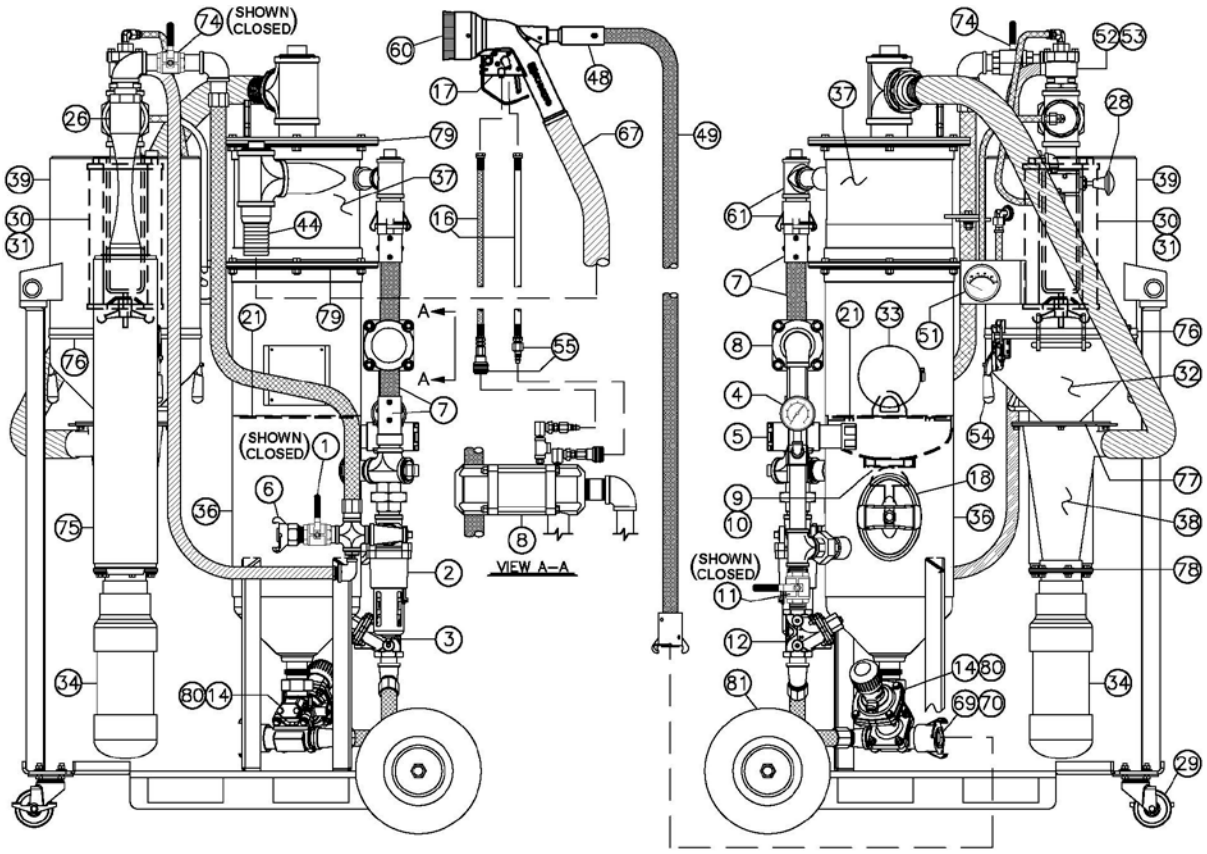

Figure 11.1 – Typical MiniBRS™ Abrasive Blast System

11.2 Malfunction with Deadman Lever in the "On" Position

11.2.1. Air blasts with no abrasive

(1) Check abrasive level in blast vessel (even if optional second outlet blasts normally).
(2) Blocked control air hose to TeraValve™ XL™ (#10) prevents opening.
(3) TeraValve™ (#10) plunger stuck in closed position.
(4) Trash plugging opening from tank to TeraValve™ (#10). See Section 11.3.
(5) Insufficient air pressure to open TeraValve™ (fully open requires 80 psig).
(6) Abrasive flow problems. See Section 11.3.
(7) Defective TeraValve™ diaphragm (air will leak from breather).
(8) Blast vessel leak (popup or handway) reduces pressure slowing abrasive flow.
(9) Air leak at TeraValve™ (#10) cleanout plug. See Section 9.5.

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

(1) TeraValve™ (#10) abrasive adjustment knob is open too far.
(2) Control air hose to automatic air valve (#15) blocked, pinched, or leaking prevents opening.
(3) Choke valve (#14) is partially closed causes differential pressure increases abrasive flow.
(4) Low air compressor output cfm (unit may cycle on and off). See Section 3.0.
(5) Blocked automatic air valve (#15) breather vent prevents full opening. See Section 9.7.
(6) Obstruction inside automatic air valve (#15) binding shaft movement.

11.2.3. Reduced Pressure at the Nozzle (with or without abrasive flow)

(1) Low air compressor output CFM. See Section 3.0 to determine air requirements.
(2) Air supply hose to blaster is too small. See Section 3.0.
(3) TeraValve™ abrasive adjustment knob (#10) is open too far. See Section 9.5.
(4) Check for leaks in blast vessel (popup or handway) or control piping.
(5) Choke valve (#14) is partially closed.
(6) Blocked automatic air valve (#15) breather vent prevents full opening. See Section 9.7.

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(7) Trash blocking the blast nozzle orifice (#27). Release deadman and allow the air pressure in the blast hose (#23) to dissipate. Close the air inlet ball valve (#5). **Note:** Only after the air in the blast hose has dissipated then remove the blast nozzle (#27) and clear blockage.

⚠ DANGER

Confirm the air in the blast hose has dissipated before removing the blast nozzle. Squeeze or step on the blast hose. Firmness or stiffness indicates that the blast hose is pressurized.
Do Not attempt to remove the blast nozzle. Allow the air to dissipate before proceeding.

⚠ WARNING

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.

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

(1) Check twinline hose fittings (#17 & #18) to see if they are connected properly.
(2) Control valve stuck in exhaust position (air leaks from breather vent) (electric units only).
(3) Control air strainer blocked; restricts air flow to deadman (electric units only).
(4) Breather vent on TeraValve™ XL™ (#10) blocked. See Section 9.5.
(5) Twinline (#21) control hoses blocked.
(6) Cartridge in deadman valve (#24) is blocked. See Section 9.8.
(7) Low air compressor output cfm (unit may cycle on and off). See Section 3.0.
(8) Air leaks in control hose from the deadman valve (#24) to automatic air valve (#15).
(9) Blocked automatic air valve (#15) breather vent prevents full opening. See Section 9.7.
(10) Trash blocking the blast nozzle orifice (#27). See Item (7) in Section 11.2.3 above.

11.3 Notes on Abrasive Flow Problems

11.3.1. TeraValve™ XL™ operation

If abrasive flow is a problem, remember; the TeraValve™ 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 (#14) and the media shut-off valve to stop blast flow. This test is to verify that the TeraValve™ is opening.

With the deadman off, screw the TeraValve™ 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 TeraValve™. 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 TeraValve™. 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 TeraValve™ piston seal.

⚠ DANGER

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

11.3.2. Choking the blast outlet

The choke valve (#14) is used to clear any trash that may get into the blast vessel and block the Tera abrasive valve orifice. Whenever trash (paint chip, cigarette butt, etc.) blocks the abrasive valve orifice, the procedure is to fully open the valve by turning the knob counterclockwise, then press down the deadman lever (#24) to

begin blasting. While blasting, have an assistant close the choke valve completely for about one second. This creates differential pressure at the abrasive valve (high pressure above; low pressure below). The higher pressure from the blast vessel should be enough to loosen the trash blocking the abrasive valve orifice and blast it through the blast nozzle (#27). To minimize excess wear of the TeraValve™ keep the choke valve fully open during normal blasting. If the blaster is equipped with the abrasive cutoff feature set the valve (or switch) to the on-position for the choke procedure (TeraValve™ blasters only).

Note: The TeraValve™ XL™ includes a cleanout port to use for this procedure. See the valve drawing in Section 9.5 (Item 13).

⚠ DANGER

Trash cleared during the choking process may block the nozzle orifice. Refer to Item (7) in Section 11.2.3 for procedure to clear nozzle.

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.

11.3.4. Contaminated Abrasive

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. To minimize the chance of abrasive flow problems a 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.

⚠ DANGER

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

11.3.5. Recycled Abrasives

Used & recycled abrasives can contain trash & coating particles removed from previously blasted items (particularly sticky coatings) that can cause abrasive to clump together and block the metering valve orifice and stop flow. Prior to use recycled abrasive must be passed through a screen with openings no larger than 1/4” round. Some applications may require smaller openings. Refer to Section 11.3.4

Trash in recycled abrasive can also prevent the abrasive valve plunger from properly seating. The result will be air leakage at the blast nozzle in the off mode. This leak will gradually worsen due to the blasting effect of the leak. This leak will cause premature wear of the seat, plunger, and sleeve.

NOTICE

Recycled abrasive can contain trash that can cause equipment malfunction. Prior to use, recycled abrasive must be passed through a screen with openings no larger than 1/4” round. Some applications may require smaller openings.

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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 stylized “S” logo, Tera™, Microvalve®, MV2®, TeraValve™, and ComboValve® are registered trademarks owned by Axxiom Manufacturing, Inc. Use of Schmidt, the Schmidt stylized “S” logo, Tera, Microvalve, MV2, TeraValve™, and ComboValve trademarks without the written consent of Axxiom Manufacturing is strictly prohibited.

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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.

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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.SchmidtAbrasiveBlasting.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, NW
Room Number N3626
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: 1-800-232-4636
Website: www.cdc.gov/niosh

National Institute of Occupational Safety and Health
Patriots Plaza 1
395 E Street, SW, Suite 9200
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
1899 L Street, NW
11th 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: 1-877-281-7772
Website: www.sspc.org

The Society for Protective Coatings
800 Trumbull Dr.
Pittsburg, PA 15205

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

Phone: 1-800-797-6223
Website: www.nace.org

National Association of Corrosion Engineers
15835 Park Ten Place
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	128	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

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NOTES

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 150 psi. However, equipment manufactured prior to 2005 can be rated at 125psi. Refer to pressure vessel nameplate.

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