

# OPERATOR'S MANUAL

## BLASTMASTER® 20 CU. FT. ABRASIVE BLASTING POTS



### **⚠ WARNING**

Before using this equipment, read, understand and follow all instructions in the Operator's Manuals provided with this equipment. If the user and/or assistants cannot read or understand the warnings and instructions, the employer of the user and/or assistants must provide adequate and necessary training to ensure proper operation and compliance with all safety procedures pertaining to this equipment. If Operator's Manuals have been lost, please visit [www.marco.us](http://www.marco.us), or contact Marco at 563.324.2519 for replacements. Failure to comply with the above warning could result in death or serious injury.



## Company Profile

Since 1944, Marco has developed a strong tradition of providing innovative and reliable products and services to the surface preparation and protective coatings industries. We are the world's premier provider of Abrasives, Blasting, Coating, Dust Collectors, Engineered Systems, Rental, Safety, Service, Repair, & Modernization, and Vacuums.

Through innovative designs and a total commitment to quality, Marco manufactures products that increase production rates, create a safer workplace, and reduce maintenance costs. Marco's industry experience, manufacturing capabilities, legendary customer service, product availability, logistics services, and technology leadership is your assurance that we deliver high quality products and services, providing the best value to you, our customer.

## The Marco Difference

- **Industry Experience** – With Marco on your team, you have access to expertise which can only come from decades of industry leadership. We have organized our engineering department, production specialists, customer operations, and safety support into a “Center of Competence.” As a Marco customer, you have access to hundreds of years of cumulative experience related to your operations.
- **Manufacturing Excellence** – Marco is a U.S. based, ISO 9001:2008 certified manufacturer of equipment for the Surface Preparation and Protective Coatings industries. Marco's engineers benchmark the industry to ensure that we design and manufacture superior products that set the “Gold Standard” for performance, safety, and quality.
- **Legendary Customer Service** – Marco's legendary customer service team is staffed by friendly, highly-trained individuals who are focused on providing the highest level of product support, order accuracy, and customer satisfaction.
- **Product Availability** – We stock over 10,000 SKU's and have more than 45 shipping locations to serve North American and International markets for all major brands of blasting and coating equipment. As the largest provider of surface preparation and protective coatings equipment in the world, our inventory levels and product availability are unmatched.
- **Logistics Services** – Marco's in-house logistics team is dedicated to moving your shipment anywhere in the world. We move more than 14,000 truckloads every year, allowing you to save on freight costs by leveraging our buying power. Lower your process costs with a single invoice, which includes product and freight.
- **Technology Leadership** – Our website provides: Operator's Manuals, Part Numbers and Schematics Guides, SDS information, and Features & Specifications Guides, providing access to information 24/7. Our Extranet application allows you to receive quotes and place orders online. Our Intranet maintains a complete record of your purchase history to assist with ongoing support of your existing equipment and future purchasing decisions.

## Vision Statement

Marco is the world's premier provider of Abrasives, Blasting, Coating, Dust Collectors, Engineered Systems, Rental, Safety, Service, Repair, & Modernization, and Vacuums.

## Mission Statement

Marco provides strong leadership and innovation to the surface preparation and protective coatings industries. We dedicate our efforts to the continuous improvement of our products, services, processes, people, and most importantly, the quality of our customer's experience.

## Quality Statement

Marco is committed to providing superior quality in the design, manufacturing, distribution, rental, service, and repair of our products. Our ISO 9001:2008 certification extends throughout all operations in all locations. Continuous improvement of our processes and supply chain Integration comprise the core of our business strategy for delivering exceptional quality and value in all Marco products and services.

## Management Philosophy

We are a company dedicated to the success of every customer and associate. We discuss, debate, challenge, measure, and test our ideas. We will be boundless and limitless in our passion to improve. Through sound leadership and dedicated associates, we will ensure a long term, profitable future for Marco, our associates, customers, and suppliers.

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## DEFINITION OF TERMS

### **DANGER**

This is an example of danger. This indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

### **CAUTION**

This is an example of a caution. This indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It can also be used to alert against unsafe practices.

### **WARNING**

This is an example of a warning. This indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

### **NOTICE**

This is an example of a notice. This indicates policy or practice directly related to safety of personnel or protection of property.

# HAZARD IDENTIFICATIONS

## **WARNING**

### **Failure to comply with ANY WARNING listed below could result in death or serious injury.**

- ▶ OSHA sets exposure limits to protect workers from exposure to respirable crystalline silica, 29 CFR 1910.1053. Airborne dust could increase the exposure levels beyond permissible limits. Breathing dust containing silica could cause silicosis, a fatal lung disease. Breathing dust during abrasive blasting operations, post-blast cleaning operations, and/or servicing equipment within the abrasive blasting area may expose an individual to conditions that could cause asbestosis, lead poisoning and/or other serious or fatal diseases. Harmful dust containing toxic material from abrasives or surfaces being abrasive blasted can remain suspended in the air for long periods of time after abrasive blasting has ceased. A NIOSH-approved, well-maintained, respirator designed for the specific operation being performed must be used by anyone abrasive blasting, handling or using the abrasive, and anyone in the area of the dust.
- ▶ Contact NIOSH and OSHA offices to determine the proper respirator for your specific application. The air supplied to the respirator must be at least Grade D quality as described in Compressed Gas Association Commodity Specification G-7.1 and as specified by OSHA Regulation 1910.134. Ensure air filter and respirator system hoses are not connected to non-air sources or in-plant lines that may contain nitrogen, oxygen, acetylene or other non-breathable gases. Before removing respirator, use an air monitoring instrument to determine if the atmosphere is safe to breathe.
- ▶ You must comply with all OSHA, local, City, State, Province, Country and jurisdiction regulations, ordinances and standards, related to your particular work area and environment. Keep unprotected individuals out of the work area.
- ▶ Abrasive blasting operators must receive thorough training on the use of abrasive resistant attire which includes: supplied-air respirator, abrasive blasting suit, safety shoes, gloves, ear protection and eye protection. Protect the operator and bystanders by complying with NIOSH and OSHA Safety Standards.
- ▶ Inspect all equipment for wear or damage before and after each use. Failure to use Original Equipment Manufacturer repair parts and failure to immediately replace worn or damaged components could void warranties and cause malfunctions.
- ▶ OSHA requires abrasive blasting nozzles be equipped with an operating valve, which shall be designed to be held open only by continuous hand pressure and shall close immediately upon release of hand pressure (i.e., a “deadman” control). The valve shall not be modified in any manner that would allow it to remain open without the application of continuous hand pressure by the operator. Failure to comply with the above warning could result in release of high speed abrasive and compressed air resulting in death or serious injury. OSHA 29CFR 1910.244(b)
- ▶ Point the abrasive blasting nozzle only at the surface being abrasive blasted. Never point the abrasive blasting nozzle or abrasive stream at yourself or others.
- ▶ Unless otherwise specified, maximum working pressure of abrasive blasting pots and related components must not exceed 150 psi. Exceeding maximum working pressure of 150 psi could cause the abrasive blasting pot and components to burst. Failure to comply with the above warning could result in death or serious injury.
- ▶ Never weld, grind or drill on the abrasive blasting pot (or any pressure vessel). Doing so will void ASME certification and manufacturer’s warranty. Welding, grinding or drilling on the abrasive blasting pot (or any pressure vessel) could weaken the vessel causing it to burst. Failure to comply with the above warning could result in death or serious injury. (ASME Pressure Vessel Code, Section VIII, Division 1)
- ▶ This equipment is not intended for use in any area that might be considered a hazardous location, as described in the National Electric Code NFPA 70, Article 500. Use of this equipment in a hazardous location could cause an explosion or electrocution.
- ▶ Never attempt to move an abrasive blasting pot containing abrasive. Never attempt to manually move abrasive blasting pots greater than 6.5 cubic foot capacity. Always use at least two capable people to manually move an abrasive blasting pot on flat, smooth surfaces. A mechanical lifting device must be used if an abrasive blasting pot is moved in any other manner.

# HAZARD IDENTIFICATIONS

## **WARNING**

**Failure to comply with ANY WARNING listed below could result in death or serious injury.**

- ▶ This product is not for use in wet environments. Always use a Ground Fault Interrupter Circuit (GFIC) for all electrical power source connections. Use of this product in wet environments could create a shock or electrocution hazard.
- ▶ Frozen moisture could cause restrictions and obstructions in pneumatic control lines. Any restriction or obstruction in the pneumatic control lines could prevent the proper activation and deactivation of the remote control system, resulting in the release of high speed abrasive and compressed air. In conditions where moisture may freeze in the control lines an antifreeze injection system approved for this application can be installed.
- ▶ Do not cut, obstruct, restrict or pinch pneumatic control lines. Doing so could prevent the proper activation and deactivation of the remote control system, resulting in the release of high speed abrasive and compressed air.
- ▶ Use of Marco remote control switches with other manufacturer's remote control systems could cause unintended activation of remote control systems resulting in the release of high speed abrasive and compressed air. Only Marco remote control switches should be used with Marco remote control systems.
- ▶ Always be certain to have secure footing when abrasive blasting. There is a recoil hazard when abrasive blasting starts that may cause user to fall and misdirect the abrasive stream at operator or bystander.
- ▶ Never use an abrasive blasting pot or attachments as a climbing device. The person could slip and fall. The abrasive blasting pot could become unstable and tip over.
- ▶ For equipment manufactured by entities other than Marco, you must consult the Original Equipment Manufacturer operator's manuals, information, training, instructions and warnings, for the proper and intended use of all equipment.
- ▶ Flammable fumes, such as solvent and paint fumes in the work area can present an ignition or explosion hazard if allowed to collect in adequate concentrations. To reduce conditions that could result in a fire or an explosion, provide adequate ventilation, eliminate all ignition or spark sources, keep the work area free of debris, store solvents and solvent contaminated rags in approved containers, follow proper grounding procedures, do not plug/unplug power cord or turn on/off power switches when flammable fumes are present, keep a working fire extinguisher or provide another fire suppression system in the work area. Cease all operations and correct condition if a spark or ignition source is identified during operation.
- ▶ Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.
- ▶ Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts.
- ▶ Surfaces of heated supply tanks, drums and/or lines as well as the adjoining plumbing may become hot during normal use. Do not touch these heated surfaces without proper protection. Deactivate and allow sufficient time for all surfaces to cool before attempting any maintenance.
- ▶ High-pressure fluid from gun, hose leaks, or ruptured components can pierce skin and can cause a serious injury that may result in amputation. Do not point gun or spray tip at anyone or at any part of the body. Keep clear of any leaks or ruptures. Depressurize the entire system before attempting cleaning, inspecting, or servicing equipment.
- ▶ Exposure to toxic fluids or fumes may occur during the normal operation of this system. Before attempting to fill, use, or service this system, read SDS's to know the specific hazards of the fluids you are using. Always use proper Personal Protective Equipment when attempting to fill, use, or service this system.
- ▶ The use of this product for any purpose other than originally intended or altered from its original design is prohibited.
- ▶ Never hang objects from the abrasive blasting pot handle. Doing so may cause the abrasive blasting pot to become unstable and tip over.

## HAZARD IDENTIFICATIONS

### CAUTION

**Failure to comply with ANY CAUTION listed below may result in minor or moderate injury.**

- ▶ Static electricity can be generated by abrasive moving through the abrasive blasting hose causing a shock hazard. Prior to use, ground the abrasive blasting pot and abrasive blasting nozzle to dissipate static electricity.
- ▶ High decibel noise levels are generated during the abrasive blasting process which may cause loss of hearing. Ensure appropriate Personal Protective Equipment and hearing protection is in use.

### NOTICE

**Failure to comply with ANY NOTICE listed below could pose a hazard to personnel or property.**

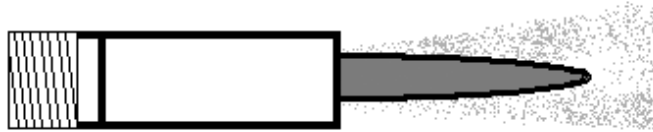
- ▶ See Air & Abrasive Consumption Chart for estimated abrasive consumption rates and required air flow (cubic feet per minute). Your system must meet these minimum requirements to ensure proper function and performance.
- ▶ Always use abrasive that is dry and properly screened. This will reduce the potential for obstructions to enter the remote control system, abrasive metering valve and abrasive blasting nozzle.
- ▶ Moisture build-up occurs when air is compressed. Any moisture within the abrasive blasting system will cause abrasive to clump, clogging metering valves, hoses and nozzles. Install an appropriately sized moisture separator at the inlet of the abrasive blasting system. Leave the moisture separator petcock slightly open to allow for constant release of water. If insufficient volume of air exists and petcock is unable to be left open (at all times) petcock should be opened frequently to release water.
- ▶ To reduce abrasive intrusion in the air supply hose, depressurize the abrasive blasting pot before shutting off air supply from compressor.
- ▶ Inspect abrasive blasting nozzle before placing into service. Damage to abrasive blasting nozzle liner or jacket may occur during shipping. If you receive a damaged abrasive blasting nozzle, contact your distributor immediately for replacement. Abrasive blasting nozzles placed into service may not be returned. Abrasive blasting nozzle liners are made of fragile materials and can be damaged by rough handling and striking against hard surfaces. Never use a damaged abrasive blasting nozzle.
- ▶ Abrasive blasting at optimal pressure for the abrasive used is critical to productivity. Example: For an abrasive with an optimal abrasive blasting pressure of 100 psi at the abrasive blasting nozzle, one pound per square inch of pressure loss will reduce abrasive blasting efficiency by 1.5%. A 10 psi reduction in air pressure will cause a 15% loss of efficiency. Use a Needle Pressure Gauge to identify pressure drops in your system. Consult with your abrasive supplier for the requirements of your abrasive.
- ▶ Replace abrasive blasting nozzle if liner or jacket is cracked or damaged. Replace abrasive blasting nozzle if original orifice size has worn 1/16" or more. Determine abrasive blasting nozzle wear by inserting a drill bit 1/16" larger than original size of abrasive blasting nozzle orifice. If the drill bit passes through abrasive blasting nozzle, replacement is needed.

# AIR & ABRASIVE CONSUMPTION CHART

## NOTICE

Failure to comply with ANY NOTICE listed below could pose a hazard to personnel or property.

- ▶ See Air & Abrasive Consumption Chart for estimated abrasive consumption rates and required air flow (cubic feet per minute). Your system must meet these minimum requirements to ensure proper function and performance.
- ▶ When it comes to air & abrasive mixtures, more is not necessarily better. Optimum abrasive blasting efficiency takes place when a lean air & abrasive mixture is used. To correctly set the abrasive metering valve, begin with the valve fully closed and slowly increase the amount of abrasive entering the airstream. As you increase the abrasive flow, watch for a “blue flame” at the exit of the abrasive blasting nozzle. Faster cutting, reduced abrasive consumption and lower clean up costs, are benefits of the “blue flame”.
- ▶ Abrasive blasting at optimal pressure for the abrasive used is critical to productivity. Example: For an abrasive with an optimal abrasive blasting pressure of 100 psi at the abrasive blasting nozzle, one pound per square inch of pressure loss will reduce abrasive blasting efficiency by 1.5%. A 10 psi reduction in air pressure will cause a 15% loss of efficiency. Use a Needle Pressure Gauge to identify pressure drops in your system. Consult with your abrasive supplier for the requirements of your abrasive.



“Blue Flame”

Air & Abrasive Consumption Chart\*

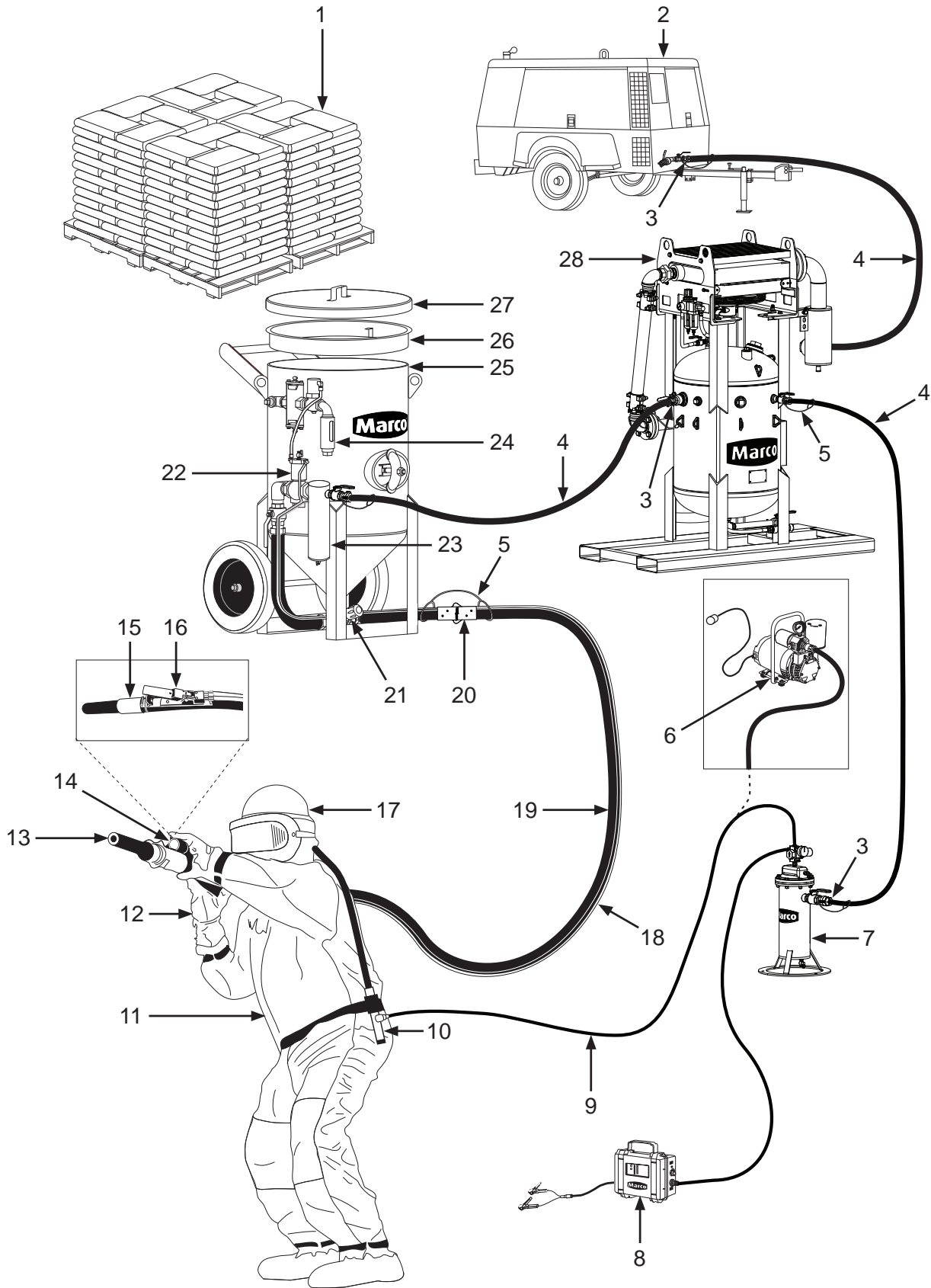
Nozzle Orifice	Pressure at the Nozzle (PSI)								Air (in cfm), Abrasive & Compressor Requirements
	50	60	70	80	90	100	125	140	
No. 2 (1/8")	11	13	15	17	18	20	25	28	Air (cfm)
	67	77	88	101	112	123	152	170	Abrasive (lbs/hr)
	2.5	3	3.5	4	4.5	5	5.5	6.2	Compressor Horsepower
No. 3 (3/16")	26	30	33	38	41	45	55	62	Air (cfm)
	150	171	196	216	238	264	319	357	Abrasive (lbs/hr)
	6	7	8	9	10	10	12	13	Compressor Horsepower
No. 4 (1/4")	47	54	61	68	74	81	98	110	Air (cfm)
	268	312	354	408	448	494	608	681	Abrasive (lbs/hr)
	11	12	14	16	17	18	22	25	Compressor Horsepower
No. 5 (5/16")	77	89	101	113	126	137	168	188	Air (cfm)
	468	534	604	672	740	812	982	1100	Abrasive (lbs/hr)
	18	20	23	26	28	31	37	41	Compressor Horsepower
No. 6 (3/8")	108	126	143	161	173	196	237	265	Air (cfm)
	668	764	864	960	1052	1152	1393	1560	Abrasive (lbs/hr)
	24	28	32	36	39	44	52	58	Compressor Horsepower
No. 7 (7/16")	147	170	194	217	240	254	314	352	Air (cfm)
	896	1032	1176	1312	1448	1584	1931	2163	Abrasive (lbs/hr)
	33	38	44	49	54	57	69	77	Compressor Horsepower
No. 8 (1/2")	195	224	252	280	309	338	409	458	Air (cfm)
	1160	1336	1512	1680	1856	2024	2459	2754	Abrasive (lbs/hr)
	44	50	56	63	69	75	90	101	Compressor Horsepower
No. 10 (5/8")	308	356	404	452	504	548	663	742	Air (cfm)
	1875	2140	2422	2690	2973	3250	3932	4405	Abrasive (lbs/hr)
	68.5	79.5	90	100.5	112	122	146	165	Compressor Horsepower
No. 12 (3/4")	432	504	572	644	692	784	948	1062	Air (cfm)
	2672	3056	3456	3840	4208	4608	5570	6238	Abrasive (lbs/hr)
	96	112	127	143	154	174.5	209	236	Compressor Horsepower

\*Abrasive consumption is based on abrasive with a bulk density of 100 lbs per Cubic Foot

**NOTICE**  
Inspect abrasive blasting nozzle before placing into service. Damage to abrasive blasting nozzle liner or jacket may occur during shipping. If you receive a damaged abrasive blasting nozzle, contact your distributor immediately for replacement. Abrasive blasting nozzles placed into service may not be returned. Abrasive blasting nozzle liners are made of fragile materials and can be damaged by rough handling and striking against hard surfaces. Never use a damaged abrasive blasting nozzle.

**NOTICE**  
Replace abrasive blasting nozzle if liner or jacket is cracked or damaged. Replace abrasive blasting nozzle if original orifice size has worn 1/16" or more. Determine abrasive blasting nozzle wear by inserting a drill bit 1/16" larger than original size of abrasive blasting nozzle orifice. If the drill bit passes through abrasive blasting nozzle, replacement is needed.

# "THE BIG PICTURE"





# DAILY PRE-OPERATION CHECKLIST

## Daily Pre-operation Checklist

- 1. Abrasive
- 2. Air Compressor
- 3. Air Hose Couplings & Gaskets
- 4. Air Hose
- 5. Safety Cable
- 6. Ambient Air Pump\*
- 7. Breathing Air Filter
- 8. CO Monitor
- 9. Breathing Line
- 10. Climate Control Device
- 11. Abrasive Blasting Suit
- 12. Gloves
- 13. Abrasive Blasting Nozzle
- 14. Lighting System\*
- 15. Abrasive Blasting Nozzle Holder
- 16. Remote Control Switch
- 17. Supplied-Air Respirator
- 18. Control Line
- 19. Abrasive Blasting Hose
- 20. Abrasive Blasting Hose Couplings & Gaskets
- 21. Abrasive Metering Valve
- 22. Remote Control System
- 23. Moisture Separator
- 24. Abrasive Blasting Pot Exhaust Muffler
- 25. Abrasive Blasting Pot
- 26. Abrasive Blasting Pot Screen
- 27. Abrasive Blasting Pot Lid
- 28. Aftercooler\*

\* *Optional or alternative device. Ask your Marco Representative for more details.*

**Abrasive** – Select the correct Abrasive (1) for the application. Review the SDS (*Safety Data Sheet*) to ensure the correct PPE (*Personal Protective Equipment*) and Environmental Controls have been selected and are in place.

**Air Compressor** – Select an Air Compressor (2) of adequate size to support all equipment requirements. Refer to “Air & Abrasive Consumption Chart” for Abrasive Blasting Nozzle (13) air consumption requirements. Before connecting Air Hose (4), sample the air being produced by the air compressor (2) to ensure it is free of petroleum contaminants.

**Air Hose, and Air Hose Couplings & Gaskets** – Select Air Hoses (4) of sufficient size to support all subsequent volumetric requirements and with a sufficient PSI (*pound per square inch*) rating. Inspect all Air Hoses (4), and Air Hose Couplings & Gaskets (3) for damage or wear. Repair or replace damaged or worn components.

**Abrasive Blasting Hose, Abrasive Blasting Hose Couplings & Gaskets, and Abrasive Blasting Nozzle Holder** – Select an Abrasive Blasting Hose (19) that has an inner diameter 3 to 4 times larger than your Abrasive Blasting Nozzle (13). Inspect Abrasive Blasting Hose (19), Abrasive Blasting Hose Couplings & Gaskets (20), and Abrasive Blasting Nozzle Holder (15) for damage or wear. Repair or replace damaged or worn components.

**Safety Cables** – Install a Safety Cable (5) at each Abrasive Blasting Hose (19), and Air Hose (4) connection points.

**Aftercooler and Moisture Separator** – Ensure Aftercooler (28) is positioned on stable ground. Keep petcock drain of Moisture Separator (23) slightly open during use. Drain both devices after each use.

**Supplied-Air Respirator, Breathing Line, Breathing Air Filter, Climate Control Device, CO Monitor, Ambient Air Pump** – You MUST consult the Operator’s Manual supplied with your Respiratory Equipment (6, 7, 8, 9, 10, 17) for ALL applicable instructions and warnings. Inspect all Respiratory Equipment components for damage or wear. Repair or replace damaged or worn components.

**Abrasive Blasting Suit and Gloves** – Select an abrasive-resistant Abrasive Blasting Suit (11) that is slightly oversized to allow ease of movement and allows air to flow around your body. Select abrasive-resistant Gloves (12) with a tight fit and a long cuff that overlaps the sleeve of the Abrasive Blasting Suit (11).

**Abrasive Metering Valve and Abrasive Blasting Pot** – Confirm Abrasive Blasting Pot (25) is positioned on stable ground. Inspect Abrasive Blasting Pot (25) and Abrasive Metering Valve (21) for damage or wear. Repair or replace damaged or worn components.

**Abrasive Blasting Pot Screen and Abrasive Blasting Pot Lid** – Always use an Abrasive Blasting Pot Screen (26) when filling Abrasive Blasting Pot (25) with Abrasive (1) to prevent debris from entering the Abrasive Blasting Pot (25). Remove Abrasive Blasting Pot Lid (27) before operating the Abrasive Blasting Pot (25). Install Abrasive Blasting Pot Lid (27) after use to protect the Abrasive Blasting Pot’s (25) interior.

**Remote Control System, Remote Control Switch, Control Line,** – Inspect Remote Control System (22) and Control Line (18) for damage or wear. Repair or replace damaged or worn components. Ensure Control Line (18) fittings connected to the Remote Control System (22) are tight and free of leaks. Ensure Remote Control Switch (16) is functioning properly. Consult Remote Control Switch Operator’s Manual for applicable instructions.

**Abrasive Blasting Pot Exhaust Muffler** – Inspect Abrasive Blasting Pot Exhaust Muffler (24) at start and end of daily use. Replace element of Abrasive Blasting Pot Exhaust Muffler (24) per Operator’s Manual instructions.

**Lighting System** – Ensure the Lighting System (14) is connected to a proper power supply before use.

# OPERATING INSTRUCTIONS

## DANGER

D-507

Do not operate this equipment without the proper pressure relief device in place. Exceeding maximum working pressure could cause vessel or components to burst. Failure to comply with the above warning will result in death or serious injury. ASME STANDARD PTC25-2014. OSHA Standard 1910.169 (B)(3)(i).

## WARNING

W-594

Read, understand, and follow the Original Equipment Manufacturer operator's manuals, information, training, instructions, and warnings, for the proper and intended use of all equipment. Failure to comply with the above warning could result in death or serious injury.

## WARNING

W-505

Inspect all equipment for wear or damage before and after each use. Failure to use Original Equipment Manufacturer repair parts and failure to immediately replace worn or damaged components could void warranties and cause malfunctions. Failure to comply with the above warning could result in death or serious injury.

## Description

The Blastmaster® 20 Cu. Ft. Abrasive Blasting Pots are pressure vessels used as part of an abrasive blasting system to deliver a mixture of abrasive and compressed air to a work surface. Marco blast pots are proudly engineered and manufactured in the USA and built in accordance with ASME guidelines. Each Marco blast pot is designed with added features to enhance work site safety. Blastmaster® Abrasive Blasting Pots are manufactured using high quality materials that resist wear, reducing costly downtime and increasing production rates. Typical applications include blast rooms, blast yards, bridges, oil refineries, pipelines, railcar shops, storage tanks, and water towers. Common abrasives used include aluminum oxide, crushed glass, garnet, mineral abrasives, slags, and steel shot & grit.

## Operational Requirements

- Proper air supply to provide a minimum of 50 psi to a maximum of 150 psi working pressure.

### *The following may cause safety hazards or reduced performance:*

- Improper installation and/or maintenance of components.
- Failure to place Blast Pot on a secure, flat surface.
- Improper air supply pressure (maximum 150 psi).
- Incorrect lifting/transporting of Blast Pot or incorrect or worn lifting devices.

## Initial Setup

- Place Blastmaster® 20 Cu. Ft. Abrasive Blasting Pots on a secure level surface that can withstand the weight of a full Blast Pot. Be aware of possible erosion of surface and load shifting.
- Ensure blast pot is depressurized.
- PNEUMATIC: Connect Pneumatic Control Line (1) to Pneumatic Solenoid (2) and Remote Control Switch (3).
- ELECTRIC: Connect Control Line Connector (4) to Connector (5) of Electric Pilot Valve Assembly (6), and Control Line Connector (7) to Electric Remote Control Switch (8).
- Connect Electrical Cord Connector (9) to Connector (10) of Marco 120-Volt AC to 12-Volt AC Power Converter (11) or Battery Clamp Assembly (12) to Twist-Lock Plug (9) of Blastmaster® 190 Electric Control Assembly (6).
- Connect air supply hose from compressor to Inlet (13) of the Blast Pot. To provide best performance, an air supply hose with an inner diameter five to six times the size of blast nozzle orifice is recommended.
- Connect blast hose to Coupling (14) installed on Abrasive Metering Valve (15).

# OPERATING INSTRUCTIONS

## WARNING

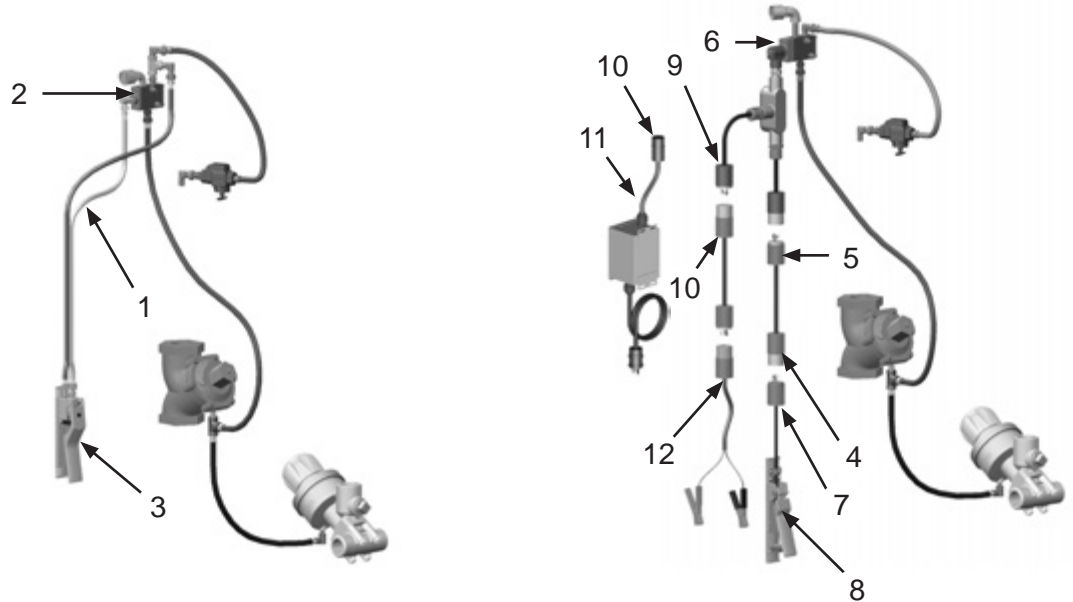
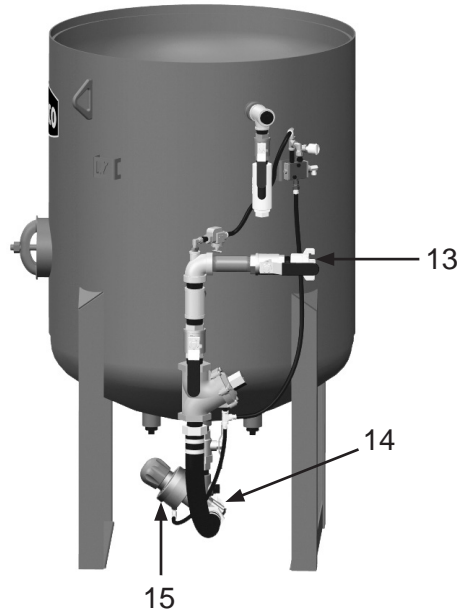
Never weld, grind or drill on the abrasive blasting pot (or any pressure vessel). Doing so will void ASME certification and manufacturer's warranty. Welding, grinding or drilling on the abrasive blasting pot (or any pressure vessel) could weaken the vessel causing it to burst. Failure to comply with the above warning could result in death or serious injury. (ASME Pressure Vessel Code, Section VIII, Division 1)

## WARNING

The use of this product for any purpose other than originally intended or altered from its original design is prohibited. Failure to comply with the above warning could result in death or serious injury.

## CAUTION

High decibel noise levels are generated during the abrasive blasting process which may cause loss of hearing. Ensure appropriate Personal Protective Equipment and hearing protection is in use. Failure to comply with the above caution may result in minor or moderate injury.



Pneumatic Remote Control

Electric Remote Control

# OPERATING INSTRUCTIONS

## DANGER

D-507

Do not operate this equipment without the proper pressure relief device in place. Exceeding maximum working pressure could cause vessel or components to burst. Failure to comply with the above warning will result in death or serious injury. ASME STANDARD PTC25-2014. OSHA Standard 1910.169 (B)(3)(i).

## WARNING

W-594

Read, understand, and follow the Original Equipment Manufacturer operator's manuals, information, training, instructions, and warnings, for the proper and intended use of all equipment. Failure to comply with the above warning could result in death or serious injury.

## WARNING

W-505

Inspect all equipment for wear or damage before and after each use. Failure to use Original Equipment Manufacturer repair parts and failure to immediately replace worn or damaged components could void warranties and cause malfunctions. Failure to comply with the above warning could result in death or serious injury.

## WARNING

W-520

The use of this product for any purpose other than originally intended or altered from its original design is prohibited. Failure to comply with the above warning could result in death or serious injury.

## Operating Instructions

Operating Instructions are limited to the instructions found in the Original Equipment Manufacturer's Operator's Manuals. Please refer to all literature included with your Blastmaster® 20 Cu. Ft. Abrasive Blasting Pots at time of delivery. If this literature is unavailable, please contact Marco for a replacement set before use.

### **Before use:**

*Note: Do Not operate this equipment without a pressure relief device installed. OSHA and ASME Code require that all pressure vessels be operated with pressure relief devices in place., It is the responsibility of the owner of the abrasive blast pot to install a pressure relief valve that meets all regulations as set forth by local, state, and federal governments.*

- Inspect entire system for air leaks or damage. Repair or replace damaged components.
- Ensure all fittings are tight and secure before use.
- Ensure sufficient compressed air supply volume and/or pressure.
- Inspect Pop-Up Valve Seat (2) and Pop-Up Valve (3) for damage. Replace damaged components before use.
- Inspect Muffler Assembly (4) for wear and abrasive. Repair or replace as needed.
- Inspect remote control system components.
- Inspect Pusher Line (5) for damage. Replace damaged components before use.
- Inspect Blast Pot (1) for damage. Do not use Blast Pot if damaged.

### **During use:**

- Close Ball Valves (6 and 7) and open Ball Valve (10) to depressurize Blast Pot. Fill Blast Pot (1) through hole in top of Blast Pot. Do not overfill, the capacity of the Blast Pot is 6.5 cubic feet of abrasive.
- Turn on air supply.
- Close Ball Valve (10) and open Ball Valve (6) to pressurize Tank (1).
- Open Ball Valve (7,15).
- Activate Remote Control Switch (11) (See remote control switch Operator's Manual for instructions). The air signal will open the GateKeeper Air Valve (12), air- actuated abrasive metering valve, and abrasive blasting will begin.
- Monitor remote control system components.
- To stop abrasive blasting, deactivate Remote Control Switch (11). This will remove the air signal from the GateKeeper Air Valve (12) and air-actuated abrasive metering valve allowing them to close.
- Set Air and Abrasive Mixture:
  - Metering Valve with Tungsten Carbide Sleeve or Urethane Sleeve.  
Rotating Knob (13) clockwise reduces the amount of abrasive, rotating the Knob counterclockwise increase the amount of abrasive. Rotate Knob clockwise until it stops, this is fully closed position. Rotate the Knob counterclockwise two full turns and activate the remote control system to start abrasive blasting, watch for a "blue flame" at the exit of the abrasive blasting nozzle. The remote control system must be in the off position to adjust the amount of abrasive. Make adjustments as needed to attain the "blue flame" at the nozzle. See Air and Abrasive Consumption Chart for guidance.

# OPERATING INSTRUCTIONS

## WARNING

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

## WARNING

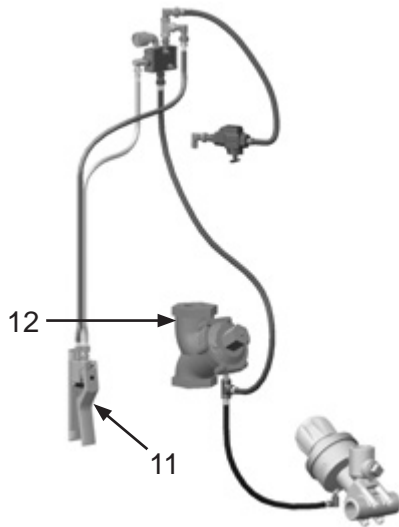
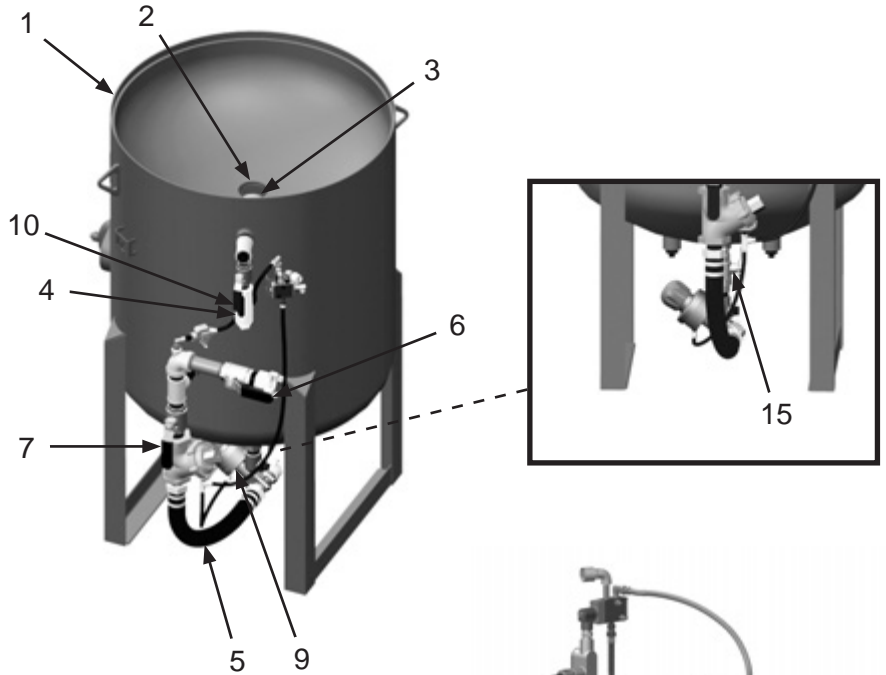
W-516

Never weld, grind or drill on the abrasive blasting pot (or any pressure vessel). Doing so will void ASME certification and manufacturer's warranty. Welding, grinding or drilling on the abrasive blasting pot (or any pressure vessel) could weaken the vessel causing it to burst. Failure to comply with the above warning could result in death or serious injury. (ASME Pressure Vessel Code, Section VIII, Division 1)

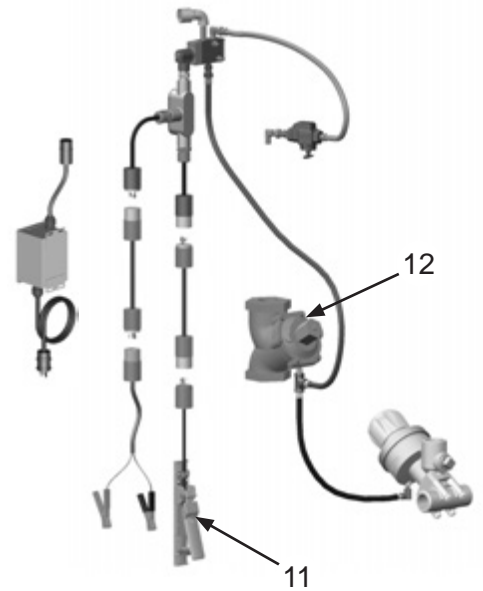
## CAUTION

C-501

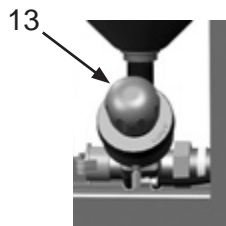
High decibel noise levels are generated during the abrasive blasting process which may cause loss of hearing. Ensure appropriate Personal Protective Equipment and hearing protection is in use. Failure to comply with the above caution may result in minor or moderate injury.



Pneumatic Remote Control



Electric Remote Control



# OPERATING INSTRUCTIONS

## **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

## **WARNING**

W-516

Never weld, grind or drill on the abrasive blasting pot (or any pressure vessel). Doing so will void ASME certification and manufacturer's warranty. Welding, grinding or drilling on the abrasive blasting pot (or any pressure vessel) could weaken the vessel causing it to burst. Failure to comply with the above warning could result in death or serious injury. (ASME Pressure Vessel Code, Section VIII, Division 1)

## **CAUTION**

C-501

High decibel noise levels are generated during the abrasive blasting process which may cause loss of hearing. Ensure appropriate Personal Protective Equipment and hearing protection is in use. Failure to comply with the above caution may result in minor or moderate injury.

### **After use:**

- Empty abrasive from Blast Pot when blasting is concluded for the day. To remove abrasive, place Metering Valve (3) in FULL OPEN position. Close Ball Valve (4). Remove Blast Nozzle from nozzle holder on blast hose.

*Note: Place blast hose in a container suitable for catching abrasive. Be prepared for strong recoil, the blast hose will provide strong recoil as abrasive exits blast hose.*

- Activate remote control system. When Blast Pot is empty, only air will exit blast hose. Deactivate remote control system. Place Metering Valve (3) in CLOSED position.
- Turn off air supply. Close Ball Valve (2). Open Ball Valve (1).
- Inspect Blast Pot components for damage. Replace damaged components before use.
- Cover Blast Pot when not in use to reduce debris and water intrusion.

# OPERATING INSTRUCTIONS

## **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

## **WARNING**

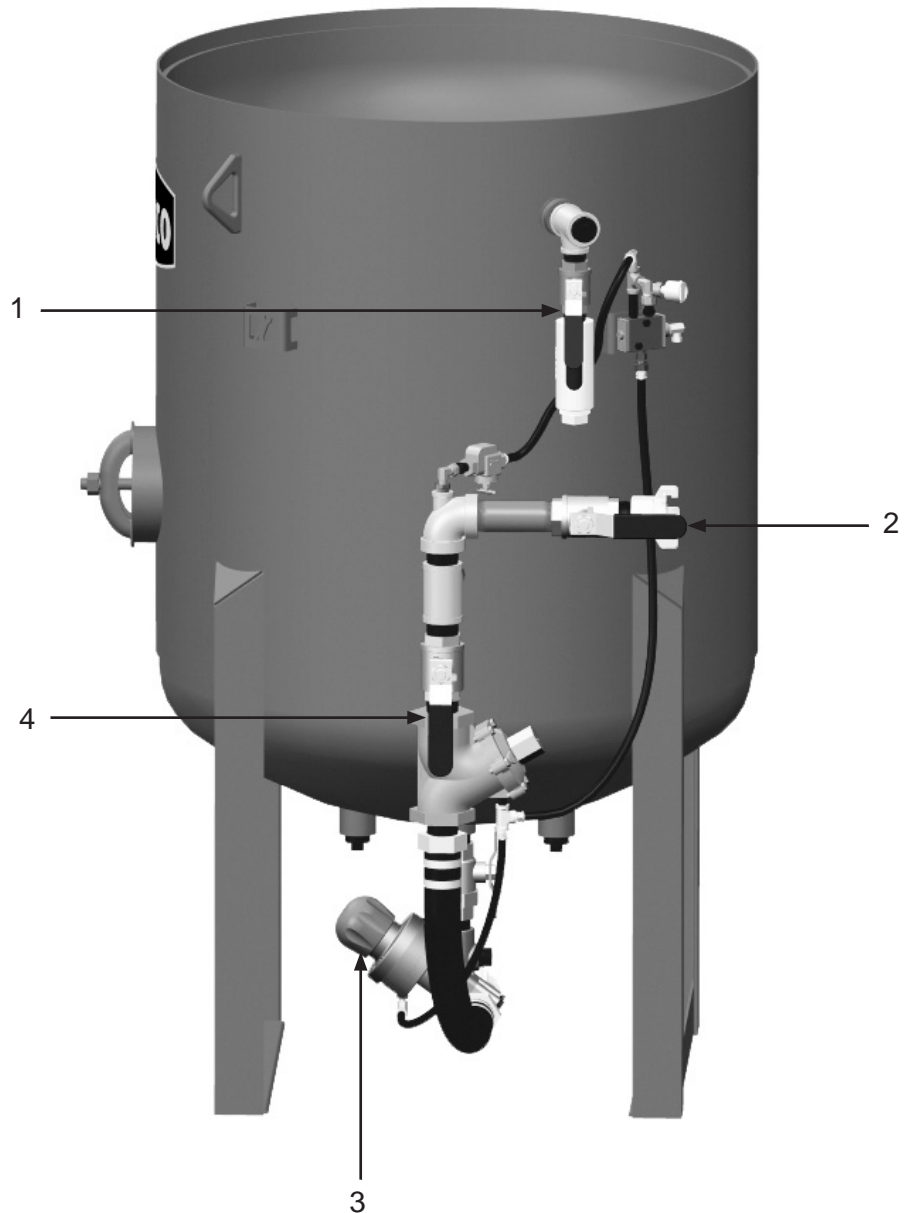
W-516

Never weld, grind or drill on the abrasive blasting pot (or any pressure vessel). Doing so will void ASME certification and manufacturer's warranty. Welding, grinding or drilling on the abrasive blasting pot (or any pressure vessel) could weaken the vessel causing it to burst. Failure to comply with the above warning could result in death or serious injury. (ASME Pressure Vessel Code, Section VIII, Division 1)

## **CAUTION**

C-501

High decibel noise levels are generated during the abrasive blasting process which may cause loss of hearing. Ensure appropriate Personal Protective Equipment and hearing protection is in use. Failure to comply with the above caution may result in minor or moderate injury.



# OPERATING INSTRUCTIONS

## Blast Hoses and Connections

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **CAUTION**

C-515

Worn blast hose assemblies can fail while blasting. Check the full length of blast hose assembly for soft spots caused by wear. Replace blast hoses that show signs of excessive wear. Failure to comply with the above caution may result in minor or moderate injury.

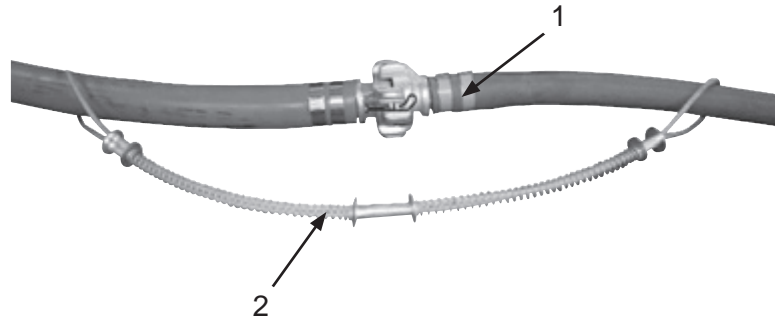
### **CAUTION**

C-516

Leaks around couplings and nozzle holders indicate worn or loose fitting parts. They could disconnect while under pressure. Inspect all couplings and nozzles daily for worn or loose fitting parts. Inspect nozzle threads for wear. Failure to comply with the above caution may result in minor or moderate injury.

Blast hoses are a high wear component of the abrasive blast system. Sharp bends in the blast hose create high wear points resulting in soft spots that can fail 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.

All air hose, blast hose, and threaded couplings have pin holes that align when connected. To protect against accidental hose disconnections, four Safety Pins (1) must be installed through these holes. As a secondary safety measure each hose connection should also include a Hose Whip Check (2) that will hold the hose if there is an accidental disconnection. Connect one loop to each side of connection and stretch out as shown below.

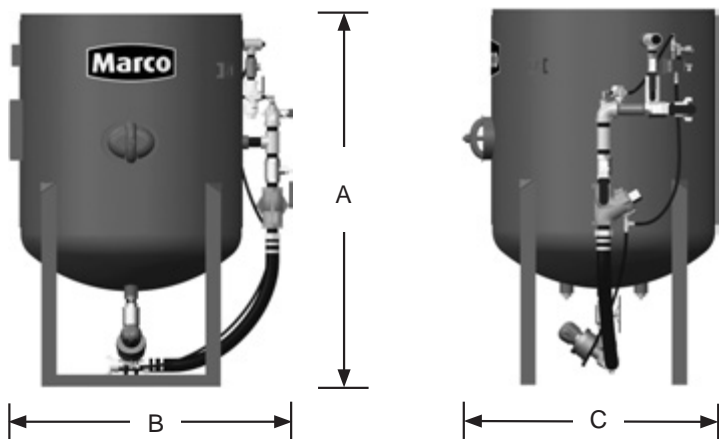


All air hose, blast hose, and threaded couplings have gaskets that seal the connection. To reduce loss of air pressure and/or premature abrasive wear replace these gaskets when leaks are found. Replace gaskets when visible wear or leaks are found.

Leaks around couplings and nozzle holders could indicate worn or loose fitting parts. They could disconnect while under pressure. Inspect all couplings and nozzles daily for worn or loose fitting parts. Check nozzle threads for wear.



# SPECIFICATIONS



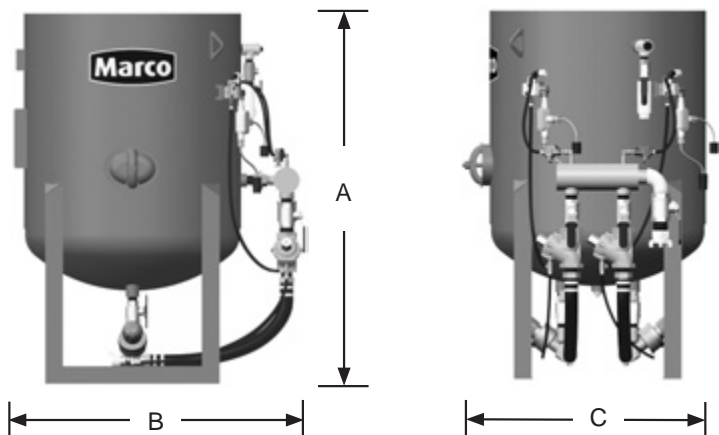
**Empty Weight:** 840 lbs

**Overall Dimensions:**

**A:** 62"

**B:** 46"

**C:** 41"



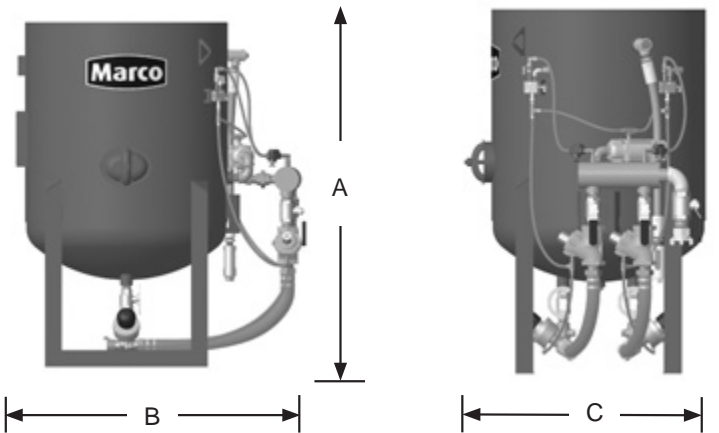
**Empty Weight:** 850 lbs

**Overall Dimensions:**

**A:** 62"

**B:** 49"

**C:** 41"



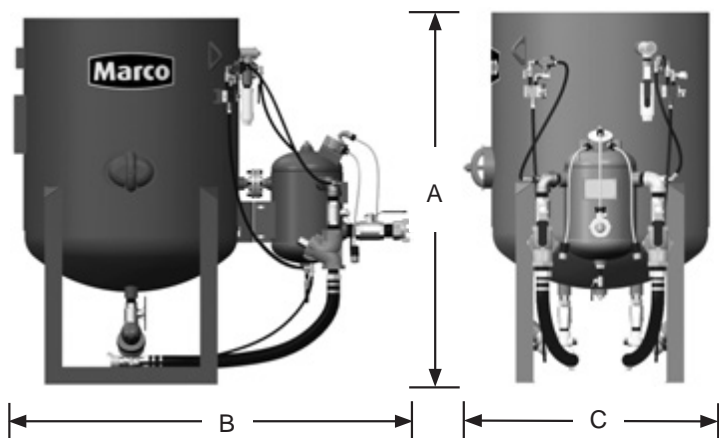
**Empty Weight:** 860 lbs

**Overall Dimensions:**

**A:** 62"

**B:** 52"

**C:** 41"



**Empty Weight:** 875 lbs

**Overall Dimensions:**

**A:** 62"

**B:** 67"

**C:** 41"

# MAINTENANCE

## Remove & Install Inspection Door Assembly

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-605

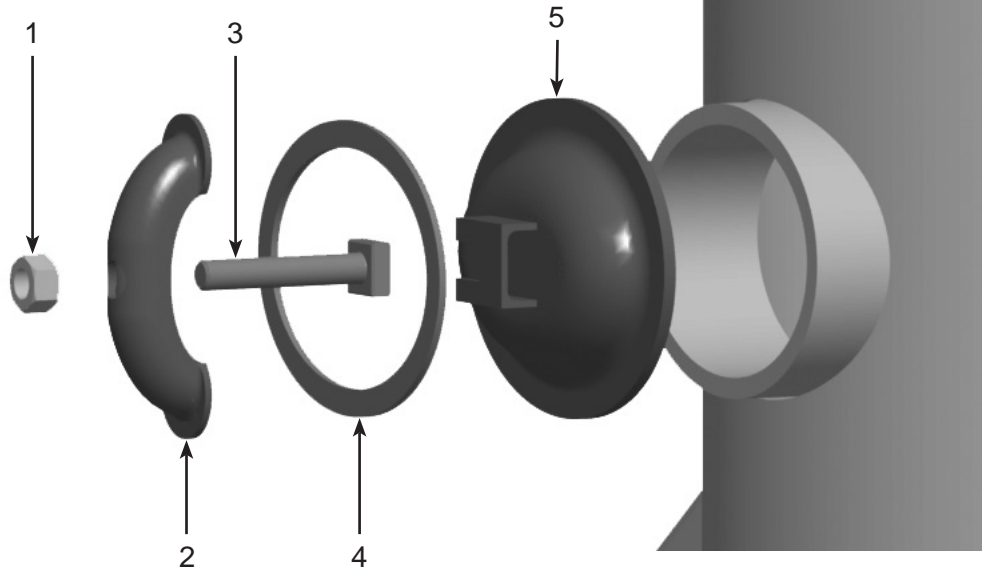
For proper operation, maintenance should be performed with the assistance of a qualified technician. Failure to comply with the above

### **CAUTION**

C-504

Release of high speed abrasive and compressed air occurs during depressurization of the abrasive blasting pot. Ensure appropriate Personal Protective Equipment is in use. Failure to comply with the above caution may result in minor or moderate injury.

- 1) Depressurize the system.
- 2) Remove Nut (1) from Bolt (3).
- 3) Remove Yoke (2) from Bolt (3).
- 4) With Bolt (3) captured in slot in Door (5), grasp Bolt (3) and push on Door (5) towards the interior of Blast Pot to free the Door (5) and Gasket (4).
- 5) Remove Door (5) and Gasket (4) from Blast Pot interior.
- 6) Install parts in reverse order using the following special instructions:
  - Ensure that Yoke (2) is tight and an air-tight seal is produced.



# MAINTENANCE

## Remove & Install Pop-up Valve

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-563

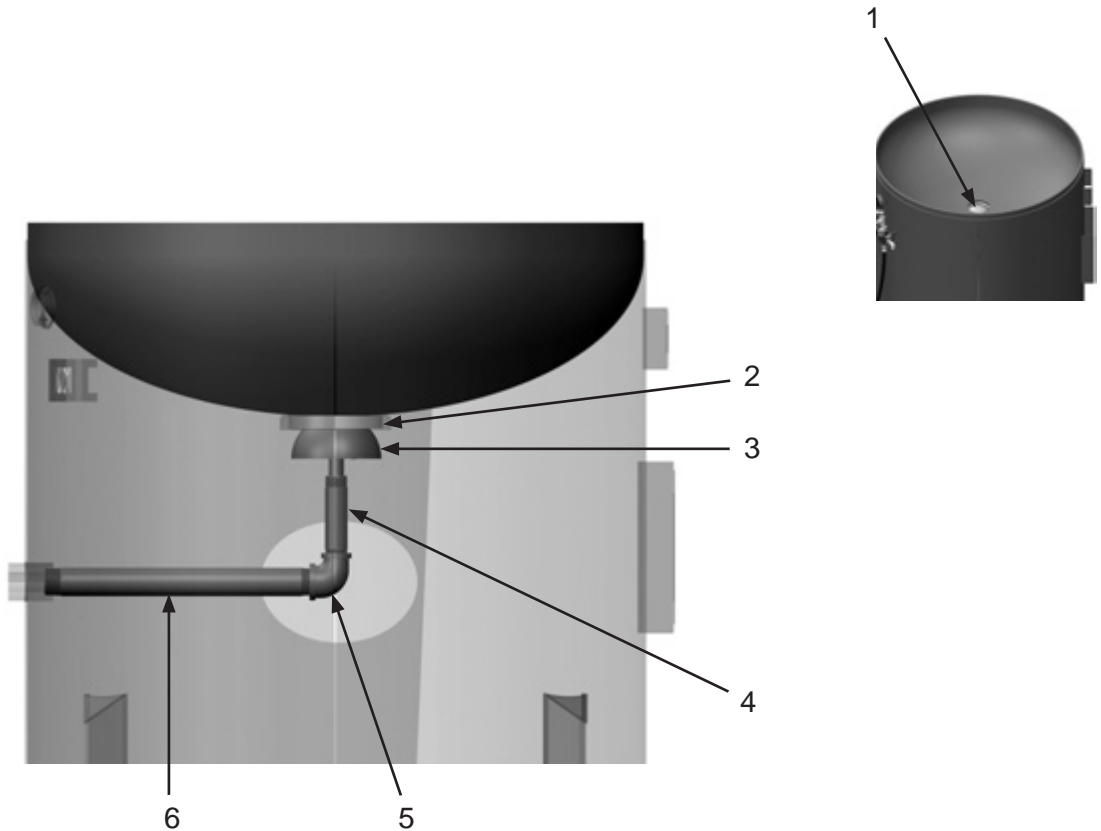
Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **CAUTION**

C-504

Release of high speed abrasive and compressed air occurs during depressurization of the abrasive blasting pot. Ensure appropriate Personal Protective Equipment is in use. Failure to comply with the above caution may result in minor or moderate injury.

- 1) Depressurize the system.
- 2) Remove Inspection Door Assembly. See Remove & Install Inspection Door Assembly.
- 3) Loosen Vertical Pipe Nipple (4) from Pipe Elbow (5). Remove Vertical Pipe Nipple and Pop-Up Valve (3) from the Blast Pot through inspection door opening.
- 4) Remove Pop-Up Valve (3) from Vertical Pipe Nipple (4).
- 5) From inside Blast Pot, with Pop-Up Valve (3) removed, pry Pop-Up Valve Seat (2) from recess in top of Blast Pot and remove through Fill Hole (1).
- 6) Remove Pipe Elbow (5) and Pipe Nipple (6). Inspect all components and replace if needed.
- 7) Install parts in reverse order using the following special instructions:
  - Tighten Vertical Pipe Nipple (4) 1/4 turn beyond hand tight.



# MAINTENANCE

## Remove & Install GateKeeper Air Valve

### **WARNING**

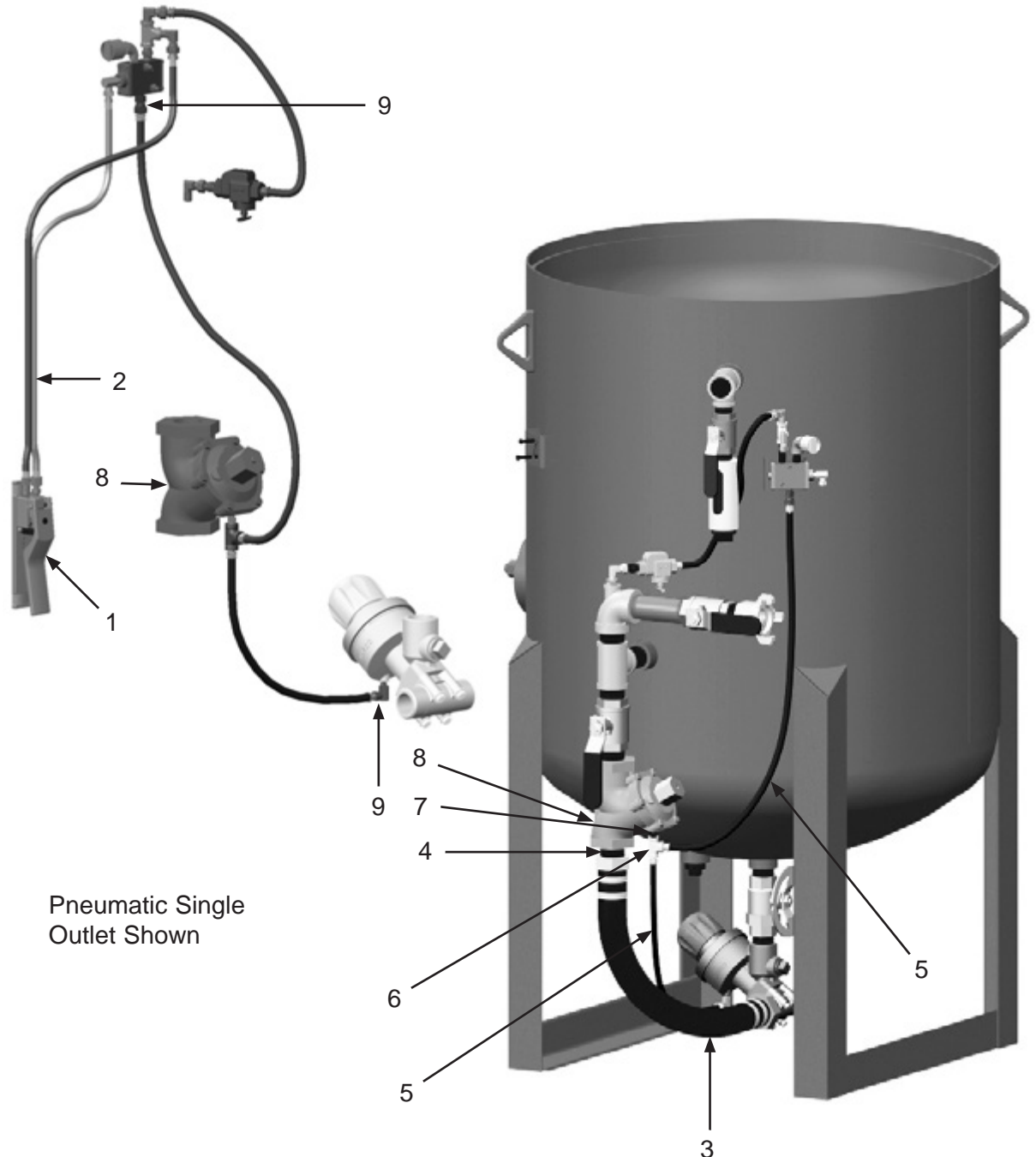
Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **NOTICE**

Apply pipe thread sealant to all pipe threads to ensure an airtight seal.

- 1) Depressurize the system.
- 2) Remove Control Switch (1) and Control Line (2).
- 3) Disconnect Pusher Assembly (3) from GateKeeper Air Valve (8) and remove Nipple (4).
- 4) Remove Control Lines (5), Tee (6), Nipple (7) and Fittings (9).
- 5) Remove GateKeeper Air Valve (8).
- 6) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*



# MAINTENANCE

## Remove & Install Blastmaster® Maxum III Abrasive Metering Valve

### **WARNING**

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

W-562

- 1) Depressurize the system.
- 2) Close Ball Valve (8).
- 3) Disconnect Pusher Assembly (3) from Metering Valve (1).
- 4) Disconnect Control Line (7) and Fitting (4).
- 5) Remove Tank Coupling (5).
- 6) Remove Metering Valve (1) and Nipple (2).
- 7) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

*Note: A Minimum Distance (6) of 10.5" from exit port of abrasive blasting pot to the ground is required for proper installation of the Blastmaster® Maxum III Abrasive Metering Valve.*

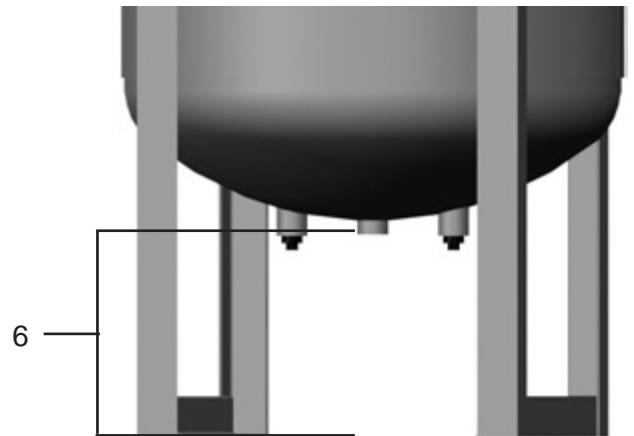
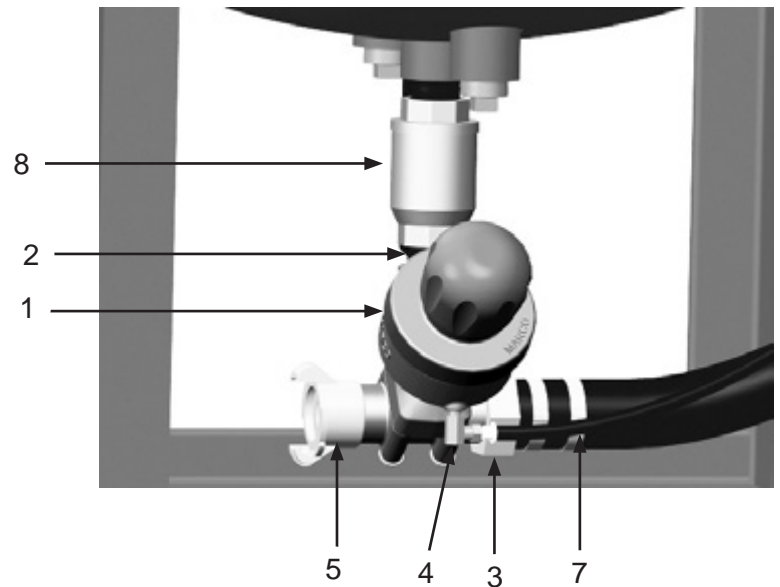
### **NOTICE**

Apply pipe thread sealant to all pipe threads to ensure an airtight seal.

N-519



Pneumatic Single Outlet Shown



# MAINTENANCE

## Remove & Install Blastmaster® 130P Remote Control System

### **WARNING**

W-562  
Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-572  
The Blastmaster® 130 Remote Control System is to be used in conjunction with a normally-closed, air-actuated abrasive metering valve. Failure to comply with the above warning could result in release of high speed abrasive and compressed air resulting in death or serious injury.

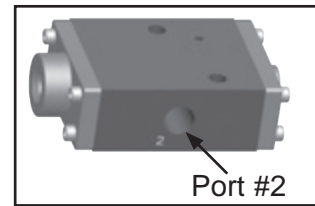
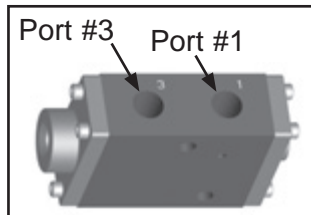
### **WARNING**

W-506  
OSHA requires blast cleaning nozzles be equipped with an operating valve, which shall be designed to be held open only by continuous hand pressure and shall close immediately upon release of hand pressure (i.e., a "deadman" control). The valve shall not be modified in any manner that would allow it to remain open without the application of continuous hand pressure by the operator. Failure to comply with the above warning could result in release of high speed abrasive and compressed air resulting in death or serious injury. OSHA 29CFR 1910.244(b)

- 1) Depressurize the system.
- 2) Remove GateKeeper Air Valve (1) (see Remove and Install GateKeeper Air Valve).
- 3) Remove Fitting (2), Nipple (3), Watts Strainer (4) and Control line (5).
- 4) Remove two Bolts and Nuts (6), and Solenoid (7).
- 5) Remove Fittings (8), Tee (9), Nipple (13), Dust Eliminator (11), Elbow (12) and Nipple (10).
- 6) Install parts in reverse order.

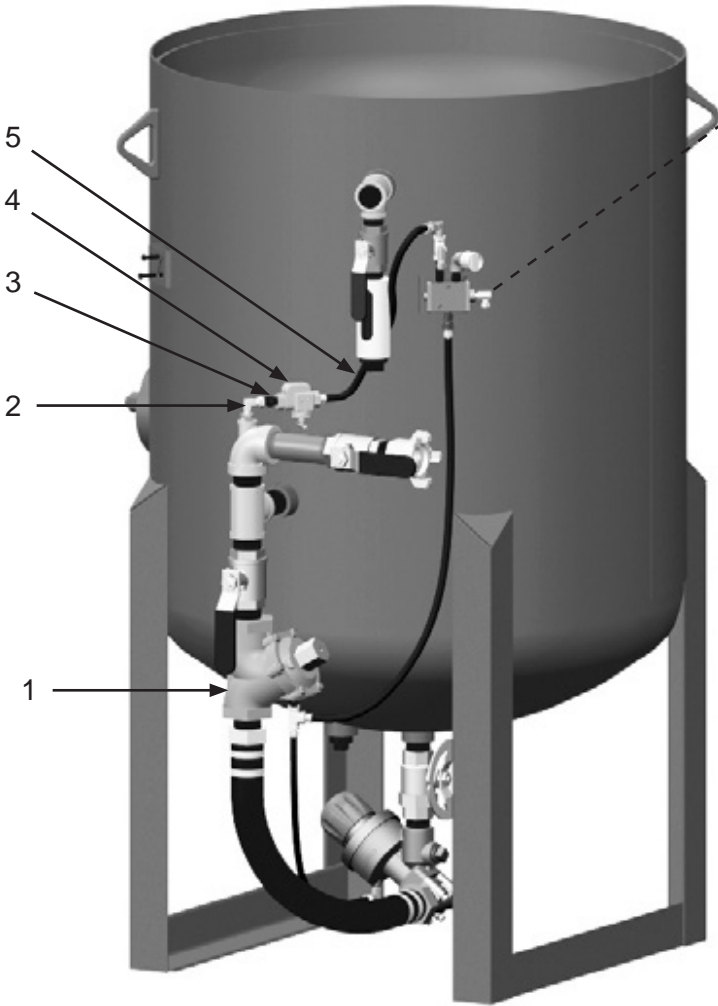
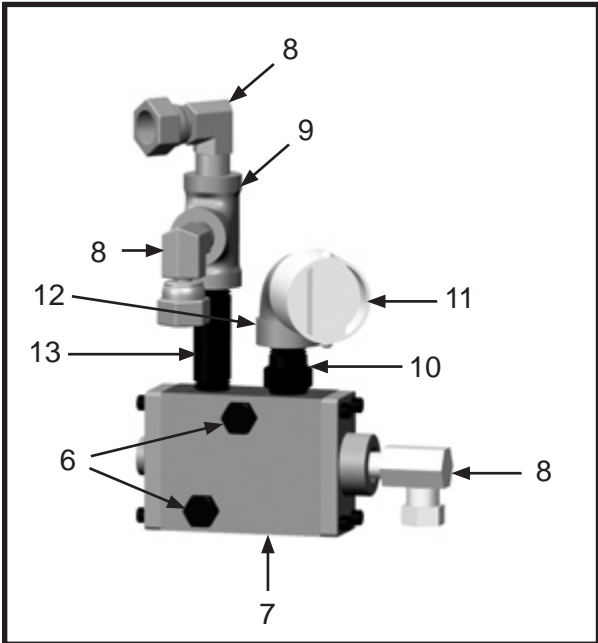
*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

*Note: When installing the Pneumatic Solenoid, ensure the control line from the air source is connected in Port #1 of the Pneumatic Solenoid, and the actuating control line is connected in Port #2 of the Pneumatic Solenoid and the Port #3 of the Pneumatic Solenoid is used as an exhaust to release air pressure from the GateKeeper Air Valve.*



# MAINTENANCE

## Remove & Install Blastmaster® 130P Remote Control System (cont.)



# MAINTENANCE

## Remove & Install Blastmaster® 130E Remote Control System

### WARNING

W-562  
Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### WARNING

W-572  
The Blastmaster® 130 Remote Control System is to be used in conjunction with a normally-closed, air-actuated abrasive metering valve. Failure to comply with the above warning could result in release of high speed abrasive and compressed air resulting in death or serious injury.

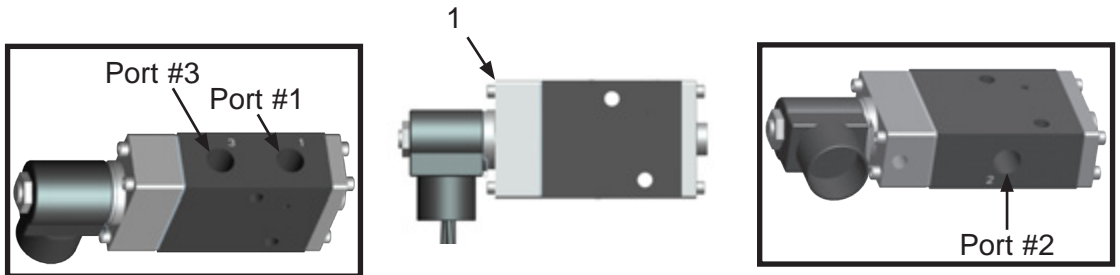
### WARNING

W-506  
OSHA requires blast cleaning nozzles be equipped with an operating valve, which shall be designed to be held open only by continuous hand pressure and shall close immediately upon release of hand pressure (i.e., a "deadman" control). The valve shall not be modified in any manner that would allow it to remain open without the application of continuous hand pressure by the operator. Failure to comply with the above warning could result in release of high speed abrasive and compressed air resulting in death or serious injury. OSHA 29CFR 1910.244(b)

- 1) Depressurize the system.
- 2) Remove GateKeeper Air Valve (1) (see Remove and Install GateKeeper Air Valve).
- 3) Remove Fitting (2), Nipple (3), Watts Strainer (4) and Control line (5).
- 4) Remove two Bolts and Nuts (6), and Solenoid (7).
- 5) Remove Fitting (8), Nipple (9), Dust Eliminator (10) and Elbow (11).
- 6) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

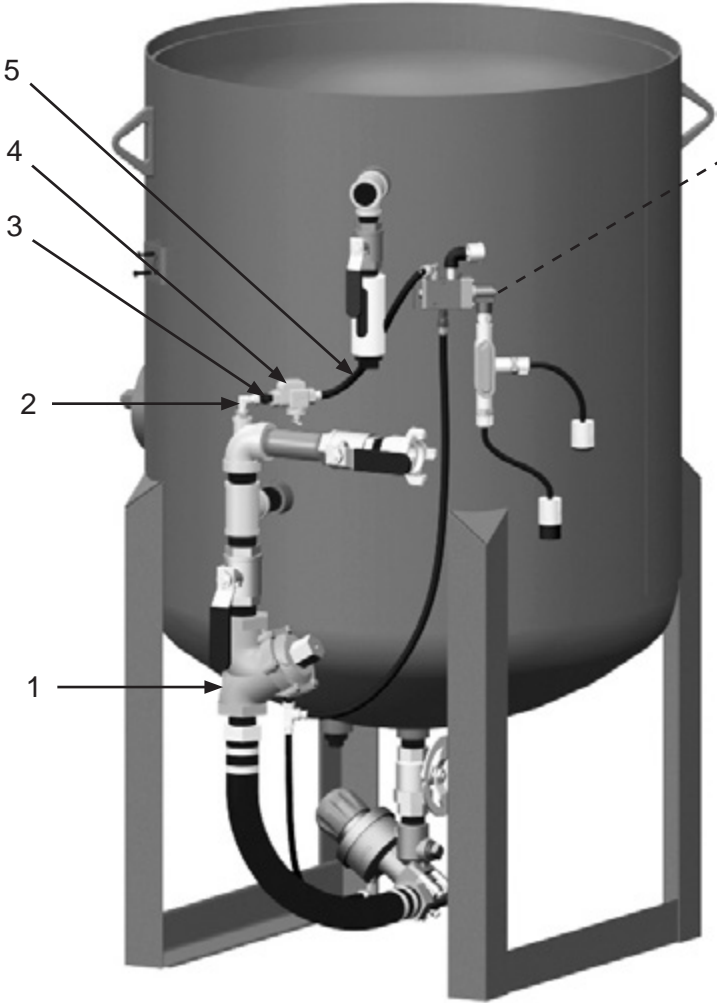
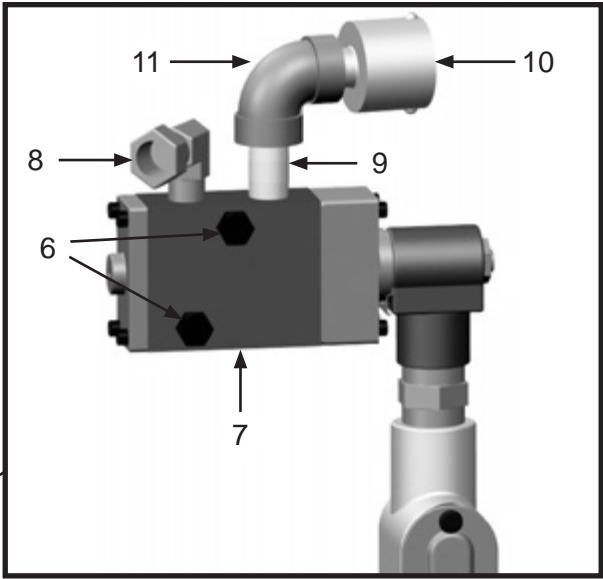
*Note: When installing the Electric Solenoid (1), ensure the air source is connected in Port #1 of the Electric Solenoid (1), and the actuating pneumatic control line is connected in Port #2 of the Electric Solenoid (1) and is connected to the GateKeeper Air Valve. Port #3 of the Electric Solenoid (1) is used as an exhaust to release air pressure from the GateKeeper Air Valve.*





# MAINTENANCE

## Remove & Install Blastmaster® 130E Remote Control System (cont.)



# MAINTENANCE

## Remove & Install Blastmaster® 123P Remote Control System

### **WARNING**

W-562  
Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

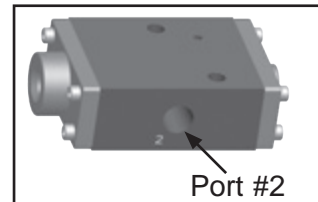
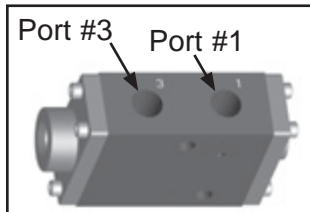
### **WARNING**

W-506  
OSHA requires blast cleaning nozzles be equipped with an operating valve, which shall be designed to be held open only by continuous hand pressure and shall close immediately upon release of hand pressure (i.e., a “deadman” control). The valve shall not be modified in any manner that would allow it to remain open without the application of continuous hand pressure by the operator. Failure to comply with the above warning could result in release of high speed abrasive and compressed air resulting in death or serious injury. OSHA 29CFR 1910.244(b)

- 1) Depressurize the system.
- 2) Remove Air Hoses (5, 11).
- 3) Remove GateKeeper Air Valve (1) (see Remove and Install GateKeeper Air Valve).
- 4) Remove Nipples (2), Ball Valves (3), Nipples (4), Fittings (6, 7), Watts Strainer (8), and Fitting (9).
- 5) Remove Bushings (13, 14), Nipple (15), and Elbow (16).
- 6) Remove Tee Fitting (21), Fittings (22, 23), Dust Eliminator (30), Elbow (31), Fitting (25), Elbow (29), Tee Fitting (28), Elbow (27), and Nipple (26).
- 7) Remove two Nuts and Bolts (24).
- 8) Repeat on second outlet.
- 9) Remove Tee Fitting (12) and Fitting (10).
- 10) Remove Tandem Valve (20), Elbow (19), Elbow (17), and Nipple (18).
- 11) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

*Note: When installing the Pneumatic Solenoid, ensure the control line from the air source is connected in Port #1 of the Pneumatic Solenoid, and the actuating control line is connected in Port #2 of the Pneumatic Solenoid and the Port #3 of the Pneumatic Solenoid is used as an exhaust to release air pressure from the GateKeeper Air Valve.*

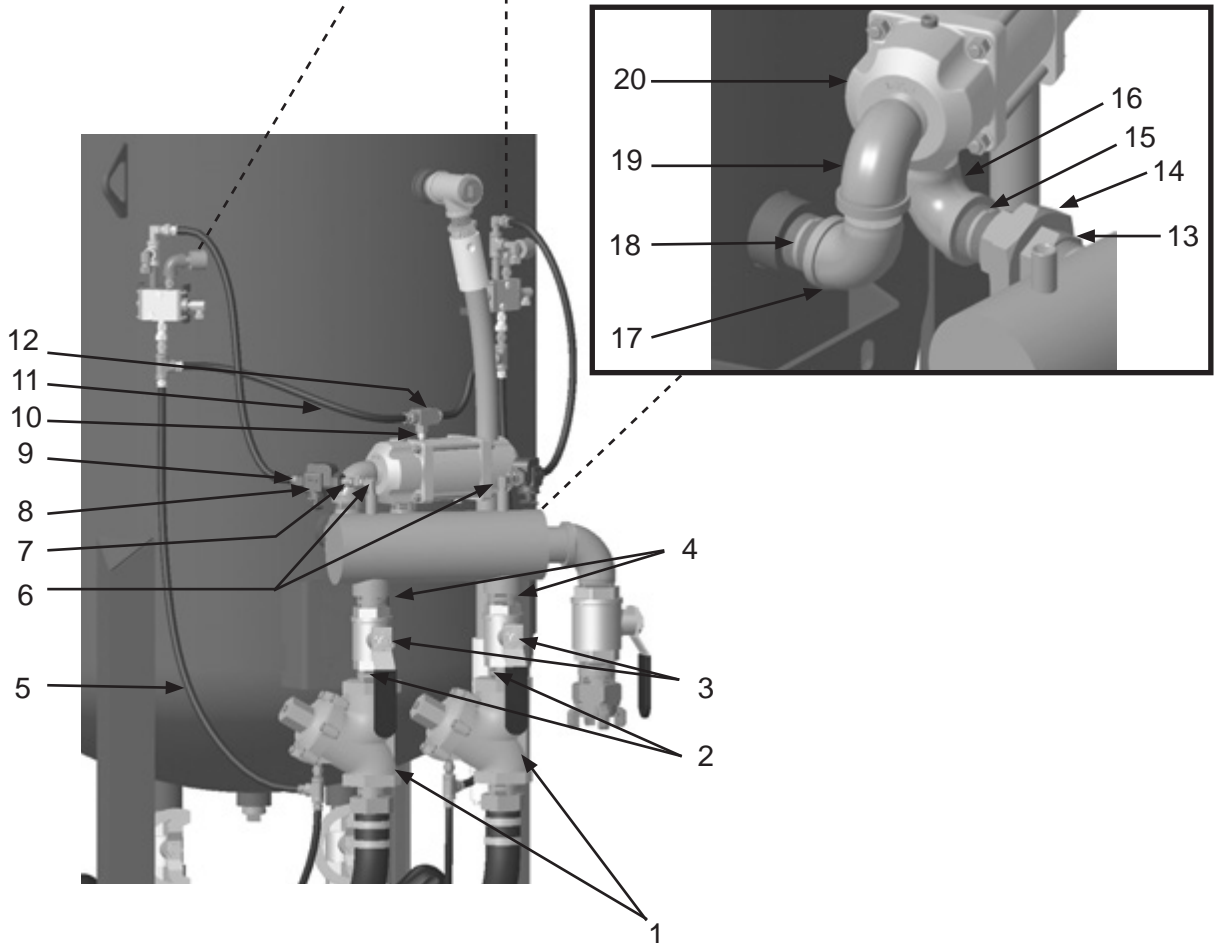
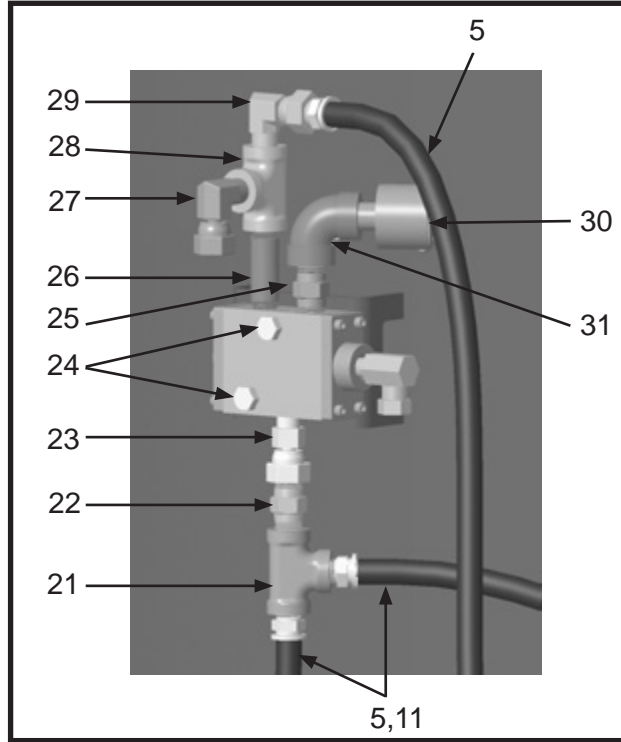


# MAINTENANCE

## Remove & Install Blastmaster® 123P Remote Control System (cont.)

### **WARNING**

Only use non-bleeder <sup>W-621</sup> Marco remote control switches with Blastmaster® 123 Remote Control Systems. Using a bleeder-style remote control switch could result in inadvertent activation of the valve, causing the blast pot to pressurize. Failure to comply with the above warning could result in death or serious injury. Call Marco at 1-800-BLAST-IT if you do not understand this warning.



# MAINTENANCE

## Remove & Install Blastmaster® 123E Remote Control System

### **WARNING**

W-562  
Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

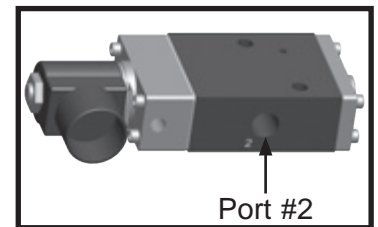
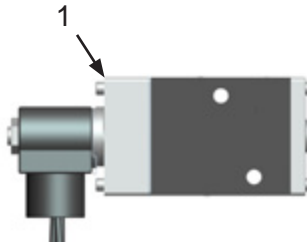
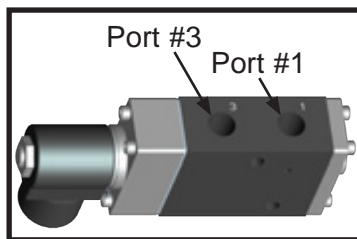
### **WARNING**

W-506  
OSHA requires blast cleaning nozzles be equipped with an operating valve, which shall be designed to be held open only by continuous hand pressure and shall close immediately upon release of hand pressure (i.e., a “deadman” control). The valve shall not be modified in any manner that would allow it to remain open without the application of continuous hand pressure by the operator. Failure to comply with the above warning could result in release of high speed abrasive and compressed air resulting in death or serious injury. OSHA 29CFR 1910.244(b)

- 1) Depressurize the system.
- 2) Remove Air Hoses (5, 11).
- 3) Remove GateKeeper Air Valve (1) (see Remove and Install GateKeeper Air Valve).
- 4) Remove Nipples (2), Ball Valves (3), Nipples (4), Fittings (6, 7), Watts Strainer (8), and Fitting (9).
- 5) Remove Bushings (13 and 14), Nipple (15), and Elbow (16).
- 6) Remove Tee Fitting (21), Fittings (22 and 23), Dust Eliminator (27), Elbow (26),
- 7) Remove two Nuts and Bolts (24).
- 8) Repeat on second outlet.
- 9) Remove Tee Fitting (12) and Fitting (10).
- 10) Remove Tandem Valve (20), Elbow (19), Elbow (17), and Nipple (18).
- 11) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

*Note: When installing the Electric Solenoid (1), ensure the air source is connected in Port #1 of the Electric Solenoid (1), and the actuating pneumatic control line is connected in Port #2 of the Electric Solenoid (1) and is connected to the GateKeeper Air Valve. Port #3 of the Electric Solenoid (1) is used as an exhaust to release air pressure from the GateKeeper Air Valve.*

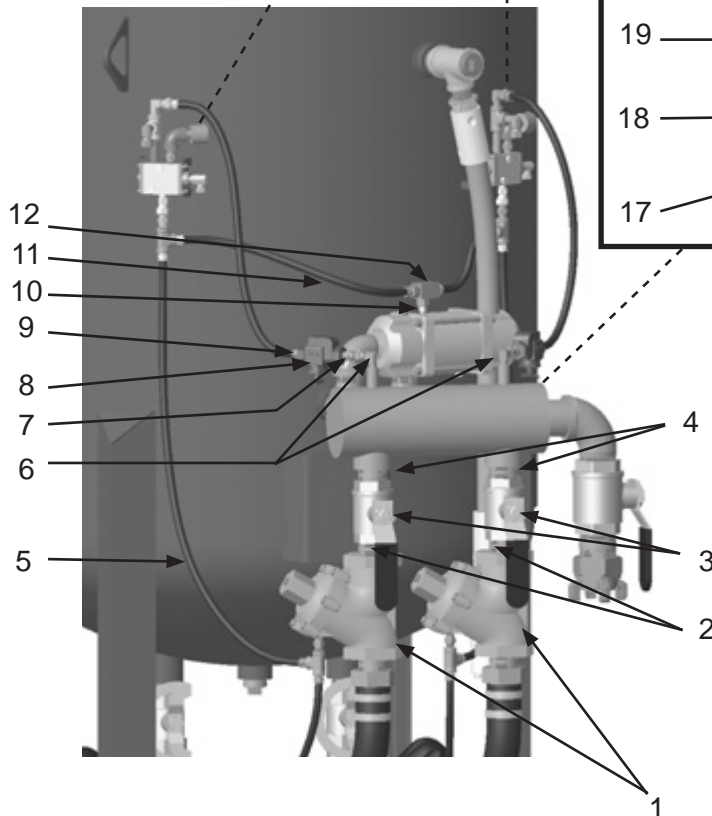
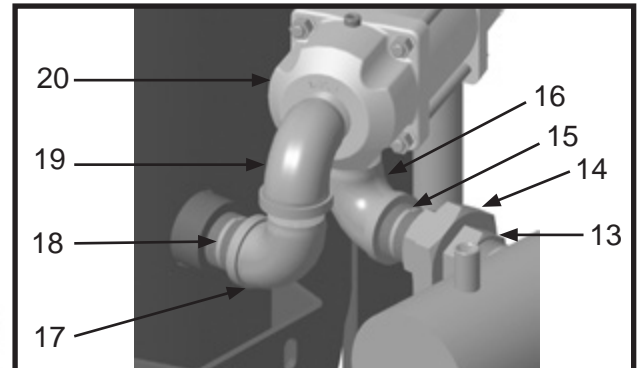
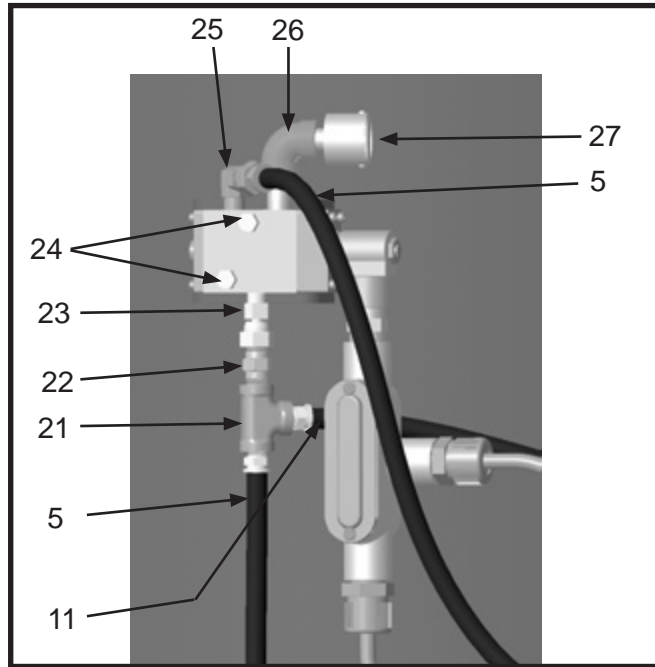


# MAINTENANCE

## Remove & Install Blastmaster® 123E Remote Control System (cont.)

### **WARNING**

Only use non-bleeder <sup>W-621</sup> Marco remote control switches with Blastmaster® 123 Remote Control Systems. Using a bleeder-style remote control switch could result in inadvertent activation of the valve, causing the blast pot to pressurize. Failure to comply with the above warning could result in death or serious injury. Call Marco at 1-800-BLAST-IT if you do not understand this warning.



# MAINTENANCE

## Remove & Install Pipe Strings - Single Outlet

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **NOTICE**

N-519

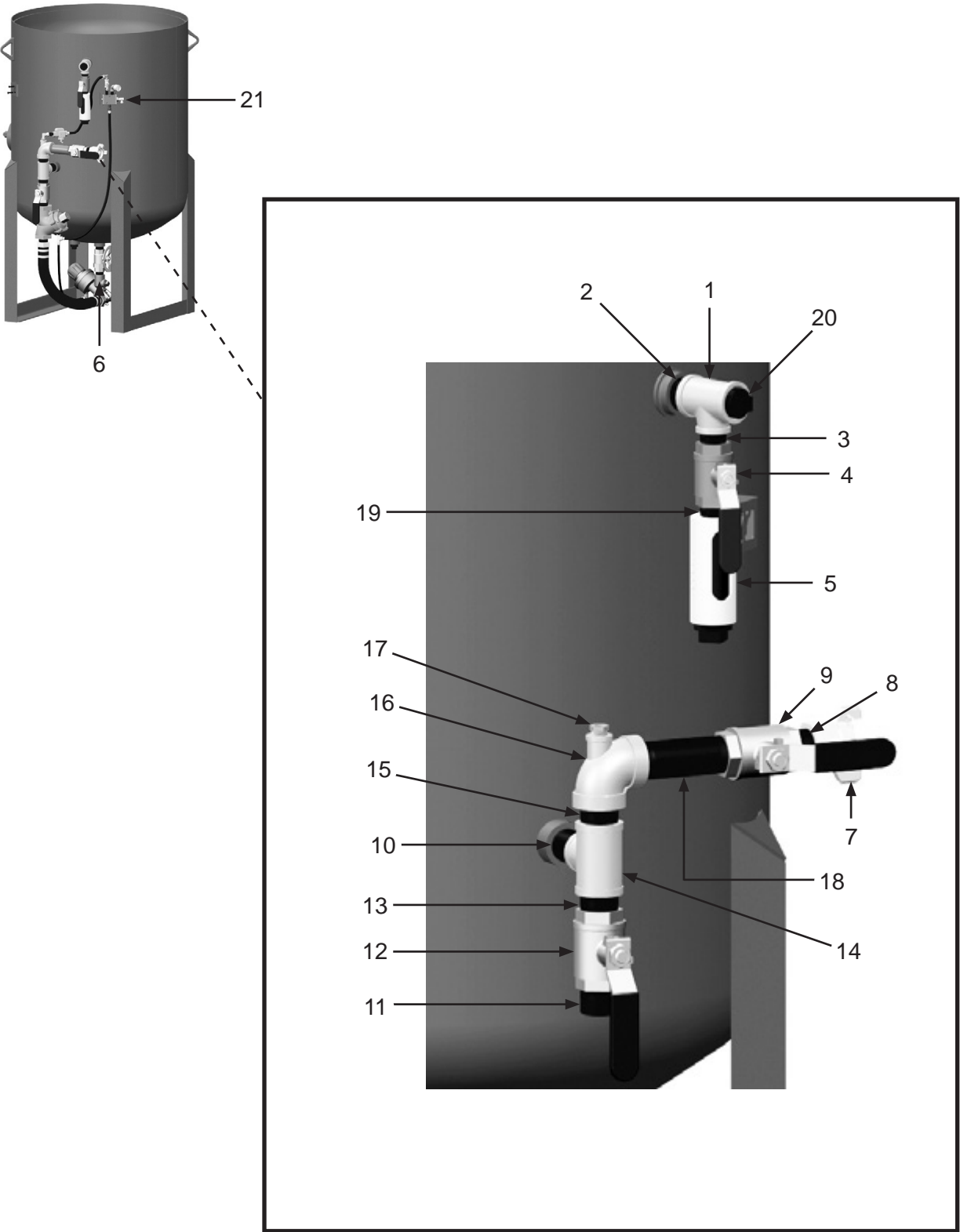
Apply pipe thread sealant to all pipe threads to ensure an airtight seal.

- 1) Depressurize the system.
- 2) Remove Remote Control System (21) (see Remove & Install Blastmaster® 130P Remote Control System or Remove & Install Blastmaster® 130E Remote Control System).
- 3) Remove Blastmaster® Maxum III Abrasive Metering Valve (6) (see Remove & Install Blastmaster® Maxum III Abrasive Metering Valve).
- 4) Remove Nipple (11), Ball Valve (12), and Nipple (13).
- 5) Remove 4-Lug Air Hose Fitting (7), Nipple (8), Ball Valve (9) and Pipe Nipple (18).
- 6) Remove Bushing (17), Elbow (16), Nipple (15), Tee (14), and Nipple (10).
- 7) Remove Muffler Assembly (5) with Nipple (19).
- 8) Remove Ball Valve (4) and Nipple (3).
- 9) Remove Tee (1), Pipe Plug (20) and Nipple (2).
- 10) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

# MAINTENANCE

## Remove & Install Pipe Strings - Single Outlet (cont.)



# MAINTENANCE

## Remove & Install Pipe Strings - Dual Outlet

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

- 1) Depressurize the system.
- 2) Remove Remote Control System (19) (see Remove & Install Blastmaster® 130P Remote Control System or Remove & Install Blastmaster® 130E Remote Control System).
- 3) Remove Blastmaster® Maxum III Abrasive Metering Valve (6) (see Remove & Install Blastmaster® Maxum III Abrasive Metering Valve).
- 4) Remove Nipples (11), Ball Valves (12), and Nipples (13).
- 5) Remove 4-Lug Air Hose Fitting (7), Nipple (8), Ball Valve (9) and Elbow (14).
- 6) Remove Manifold (15), Pipe Union (16) and Nipple (10).
- 7) Remove Muffler Assembly (5) with Nipple (17).
- 8) Remove Ball Valve (4) and Nipple (3).
- 9) Remove Tee (1), Pipe Plug (18) and Nipple (2).
- 10) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

### **NOTICE**

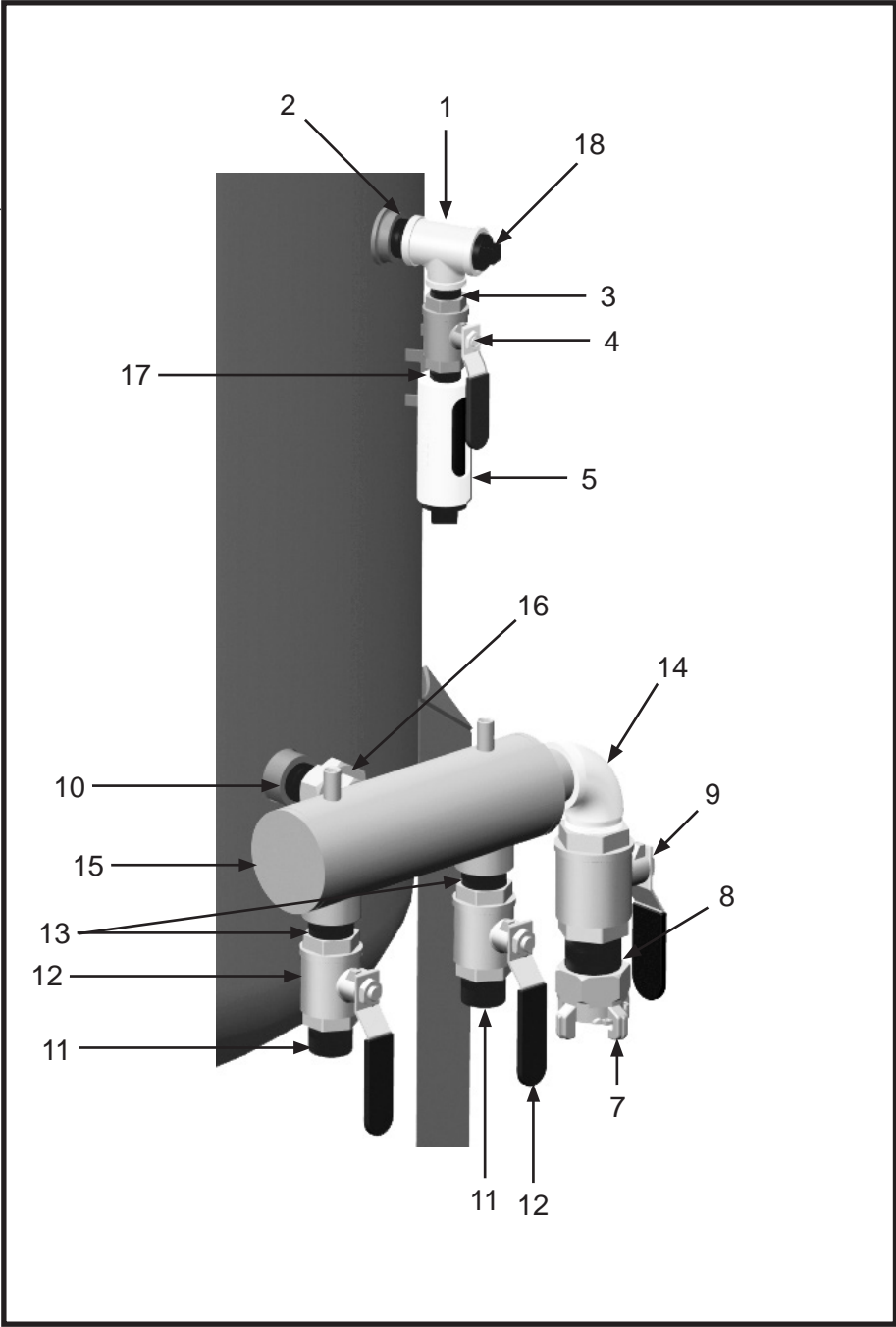
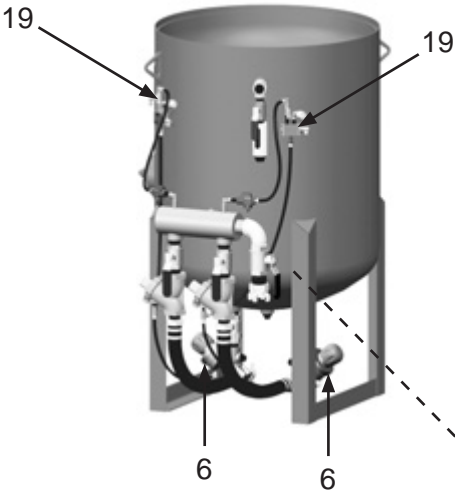
N-519

Apply pipe thread sealant to all pipe threads to ensure an airtight seal.



# MAINTENANCE

## Remove & Install Pipe Strings - Dual Outlet (cont.)



# MAINTENANCE

## Remove & Install Pipe Strings - 800 CFM Moisture Separator

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **NOTICE**

N-519

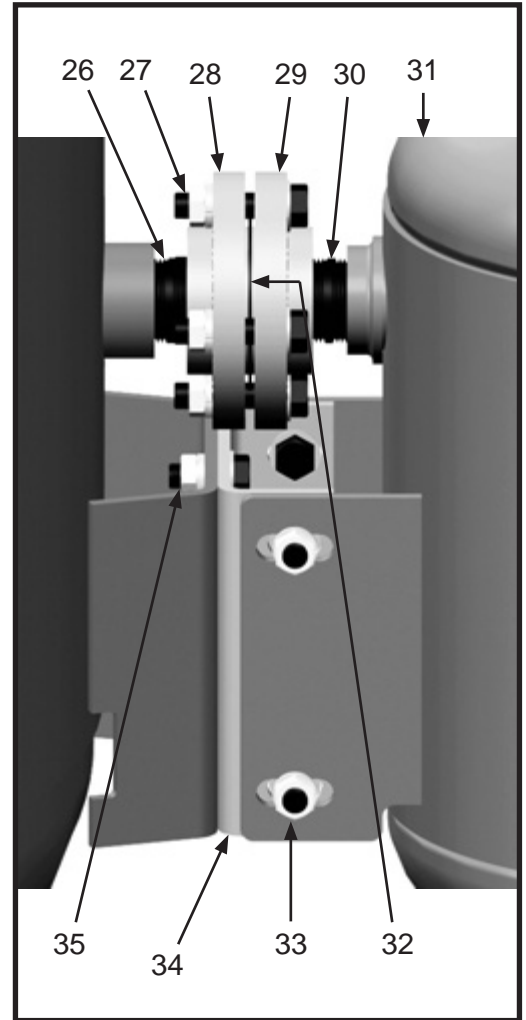
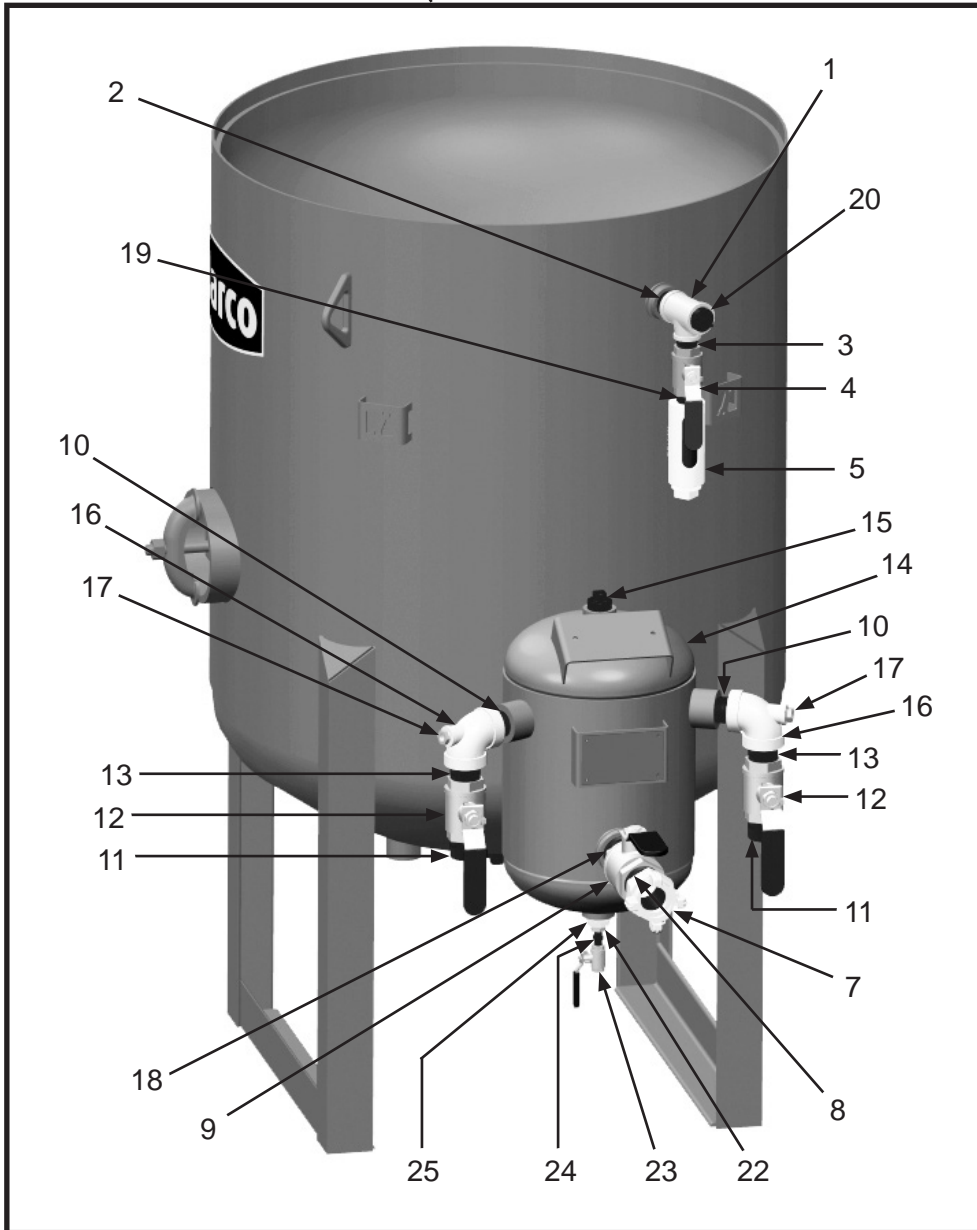
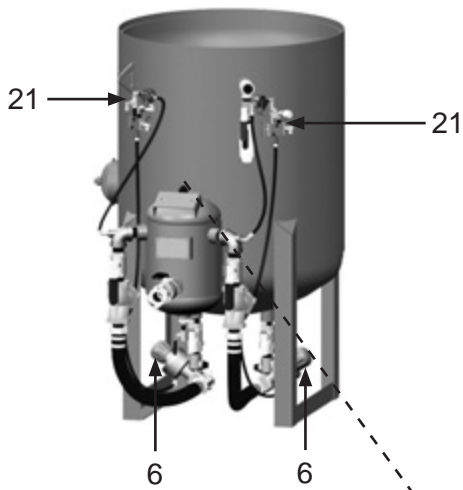
Apply pipe thread sealant to all pipe threads to ensure an airtight seal.

- 1) Depressurize the system.
- 2) Remove Remote Control System (21) (see Remove & Install Blastmaster® 130P Remote Control System or Remove & Install Blastmaster® 130E Remote Control System).
- 3) Remove Blastmaster® Maxum III Abrasive Metering Valve (6) (see Remove & Install Blastmaster® Maxum III Abrasive Metering Valve).
- 4) Remove Nipples (11), Ball Valves (12), and Nipples (13).
- 5) Remove 4-Lug Air Hose Fitting (7), Nipple (8), Ball Valve (9), and Nipple (18).
- 6) Remove Bushings (17), Elbows (16), and Nipples (10).
- 7) Remove Muffler Assembly (5) with Nipple (19).
- 8) Remove Ball Valve (4) and Nipple (3).
- 9) Remove Tee (1), Pipe Plug (20), and Nipple (2).
- 10) Remove Ball Valve (23), Nipple (24), and Bushings (22,25).
- 11) Remove four Bolts, Nuts, Washers and Lock Washers (27).
- 12) Remove four Bolts, Nuts, Washers and Lock Washers (33).
- 13) Remove 800 CFM Moisture Separator (31), Nipple (30), Flange (29), and Gasket (32).
- 14) Remove Flange (28) and Nipple (26).
- 15) Remove four Bolts, Nuts, Washers, and Lock Washers (35).
- 16) Remove Bracket (34).
- 17) Install parts in reverse order.

*Note: Apply pipe thread sealant to all pipe threads to ensure an airtight seal.*

# MAINTENANCE

## Remove & Install Pipe Strings - 800 CFM Moisture Separator (cont.)



# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve

Maintenance of the Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve is limited to daily cleaning and immediate replacement of damaged or worn parts.

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-563

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **WARNING**

W-529

Never use compressed air to separate or remove internal components during maintenance. Components could be ejected at high speeds. Failure to comply with the above warning could result in death or serious injury.

### **Disassemble:**

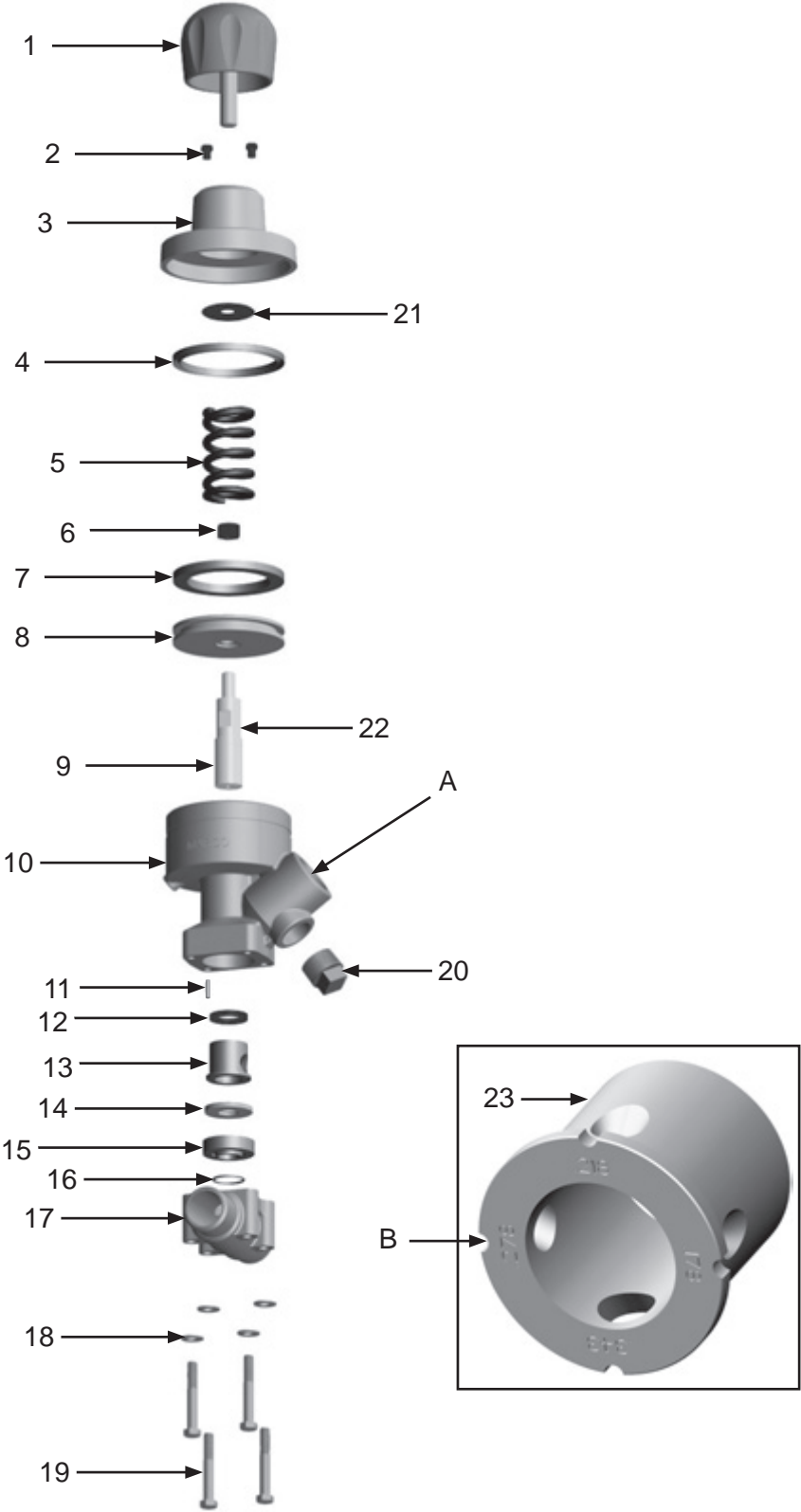
- 1) Remove Knob (1) from Cap (3) by turning counter-clockwise.
- 2) Remove two 1/8" Breather Mufflers (2) from Cap (3)
- 3) Remove Bolts (19), Washers (18) and Base (17) from Body (10).
- 4) Remove O-ring (16), Seat (15), Insert (14), and Metering Sleeve (13) from Body (10). If using Multi-port Sleeve, record the size of orifice positioned toward opening A to aid in assembly.
- 5) Using a strap wrench, remove Cap (3) by turning counter-clockwise. There will be tension on the Cap from Spring (5).
- 6) Remove Spring (5), Bump Ring (4) and Vibration Disc (21) from Body (10).
- 7) To remove Piston (8), push Plunger (9) through Body (10).
- 8) Remove Pipe Plug (20) from Body (10).
- 9) Remove Plunger Seal (12).
- 10) Remove Groove Pin (11) from Body (10).
- 11) Remove Piston (8) from Plunger (9) by placing wrench on rectangular Grooves (22) on Plunger and remove Nut (6).
- 12) Remove Piston Seal (7) from Piston (8).

### **Assemble:**

- 1) Install Piston Seal (7) in groove in Piston (8). Ensure open side of Piston Seal is facing flat side of Piston.
- 2) Place threaded end of Plunger (9) in center hole through bottom of Piston (8). Thread Nut (6) on Plunger. Place a wrench on rectangular Grooves (22) on Plunger and tighten Nut to 70 foot/pounds.
- 3) Lightly lubricate Piston Seal (7) and Body (10) walls with white lithium grease. With Nut (6) facing up, place Piston Assembly in Body.
- 4) Install Groove Pin (11) in recess. With inner O-ring of Plunger Seal (12) facing up, slide Plunger Seal over Plunger and seat in recess of Body (10).
- 5) Align notch in Tungsten Carbide Sleeve (13) with Groove Pin (11). Place Tungsten Carbide Sleeve on Plunger (9). If Multi-port Sleeve (23) is used, align selected orifice with opening (A). Groove (B) opposite of selected orifice will seat on Groove Pin (11).
- 6) Place Seat (14) in top of Insert (15) with beveled side up. Place O-ring (16) in recess on the bottom of Insert. Place assembly on Body (10), aligning with Tungsten Carbide Sleeve (13).
- 7) Install Base (17) on Body (10) using Washer (18) and Bolt (19). Tighten to hand tight. Repeat for each bolt.
- 8) Install Vibration Disc (21) into Cap (3).
- 9) Apply light film of white lithium grease on all sides of Bump Ring (4) and place on Piston (8).
- 10) Place Spring (5) in Cap (3) and thread onto Body (10). Using a strap wrench, install Cap onto Body, there will be tension from Spring.
- 11) Tighten Bolts (19) to 30 foot/pounds.
- 12) Install two 1/8" Breather Mufflers (2) into Cap (3).
- 13) Install Pipe Plug (20).
- 14) Thread Knob (1) into Cap (3).

# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve (cont.)



# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Urethane Sleeve

Maintenance of the Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve is limited to daily cleaning and immediate replacement of damaged or worn parts.

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-563

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **WARNING**

W-529

Never use compressed air to separate or remove internal components during maintenance. Components could be ejected at high speeds. Failure to comply with the above warning could result in death or serious injury.

#### **Disassemble:**

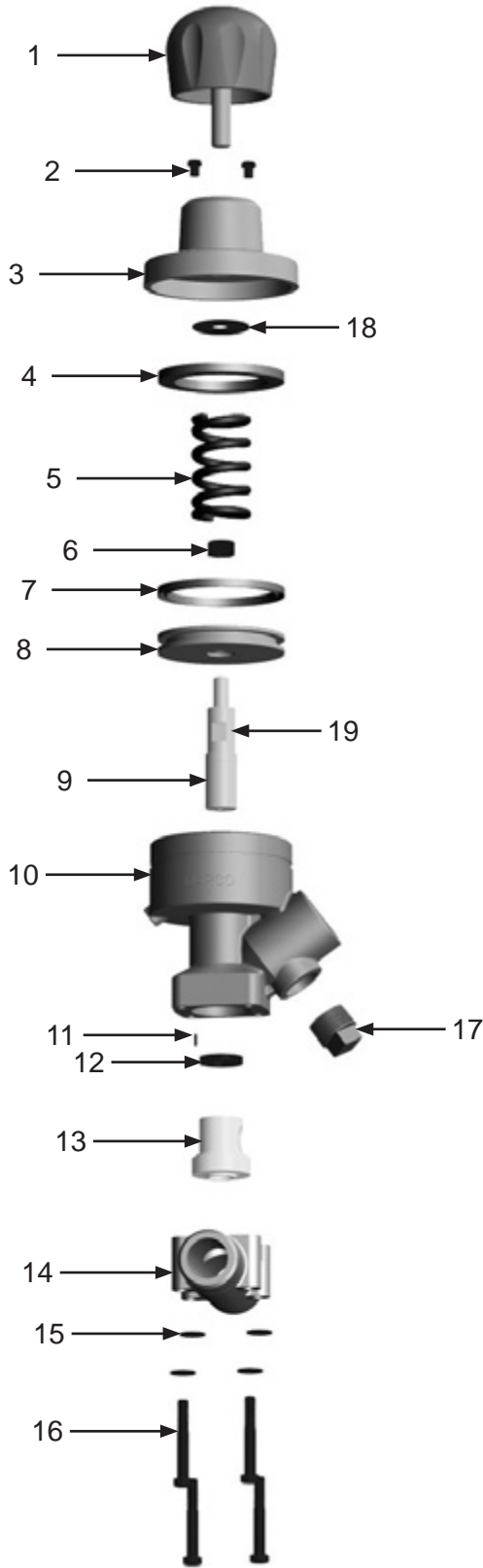
- 1) Remove Knob (1) from Cap (3) by turning counter-clockwise.
- 2) Remove two 1/8" Breather Mufflers (2) from Cap (3).
- 3) Remove Bolts (16), Washers (15) and Base (14) from Body (10).
- 4) Remove Urethane Sleeve (13) from Body (10).
- 5) Using a strap wrench, remove Cap (3) by turning counter-clockwise. There will be tension on the Cap from Spring (5).
- 6) Remove Spring (5), Bump Ring (4) and Vibration Disc (18) from Body (10).
- 7) To remove Piston (8), push Plunger (9) through Body (10).
- 8) Remove Plunger Seal (12).
- 9) If damaged, remove Groove Pin (11) from Body (10).
- 10) Remove Pipe Plug (17) from Body (10).
- 11) Remove Piston (8) from Plunger (9) by placing a wrench on the rectangular grooves on Plunger and remove Nut (6).
- 12) Remove Piston Seal (7) from Piston (8).

#### **Assemble:**

- 1) Install Piston Seal (7) in groove in Piston (8). Ensure open side of Piston Seal is facing flat side of Piston.
- 2) Place threaded end of Plunger (9) in center hole through bottom of Piston (8). Thread Nut (6) on Plunger. Place a wrench on rectangular grooves on Plunger and tighten Nut to 70 foot/pounds.
- 3) Lightly lubricate Piston Seal (7) and Body (10) walls with white lithium grease. With Nut (6) facing up, place Piston (8) and Plunger (9) Assembly in Body.
- 4) Install Groove Pin (11) in recess. With inner O-ring of Plunger Seal (12) facing up, slide Plunger Seal over Plunger and seat in recess of Body (10).
- 5) Align notch in Urethane Sleeve (13) with Groove Pin (11). Place Urethane Sleeve on Plunger (9).
- 6) Install Base (14) on Body (10) using Washer (15) and Bolt (16). Tighten to hand tight. Repeat for each bolt.
- 7) Install Vibration Disc (18) into Cap (3).
- 8) Apply light film of white lithium grease on all sides of Bump Ring (4) and place on Piston (8).
- 9) Place Spring (5) in Cap (3) and thread Cap onto Body (10). Using a strap wrench, tighten Cap onto Body, there will be tension from Spring.
- 10) Tighten Bolts (16) to 30 foot/pounds.
- 11) Install two 1/8" Breather Mufflers (2) into Cap (3).
- 12) Install Pipe Plug (17).
- 13) Thread Knob (1) into Cap (3).

# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Urethane Sleeve (cont.)



# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve — 2”

Maintenance of the Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve is limited to daily cleaning and immediate replacement of damaged or worn parts.

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-563

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **WARNING**

W-529

Never use compressed air to separate or remove internal components during maintenance. Components could be ejected at high speeds. Failure to comply with the above warning could result in death or serious injury.

#### **Disassemble:**

- 1) Remove Knob (1) from Cap (3) by turning counter-clockwise.
- 2) Remove two 1/8" Breather Mufflers (2) from Cap (3)
- 3) Remove Bolts (24), Washers (23), Lock Washers (18), Nuts (19) and Base (22).
- 4) Remove Cap Screws (21) and Adapter Plate (20).
- 5) Remove O-ring (17), Seat (16), Insert (15), and Tungsten Carbide Sleeve (14) from Body (11).
- 6) Using a strap wrench, remove Cap (3) by turning counter-clockwise. There will be tension on the Cap from Spring (6).
- 7) Remove Spring (6), Bump Ring (5) and Vibration Disc (4) from Body (11).
- 8) To remove Piston (9), push Plunger (10) through Body (11).
- 9) Remove Pipe Plug (25) from Body (11).
- 10) Remove Plunger Seal (13).
- 11) Remove Groove Pin (12) from Body (11).
- 12) Remove Piston (9) from Plunger (10) by placing wrench on rectangular Grooves (26) on Plunger and remove Nut (7).
- 13) Remove Piston Seal (8) from Piston (9).

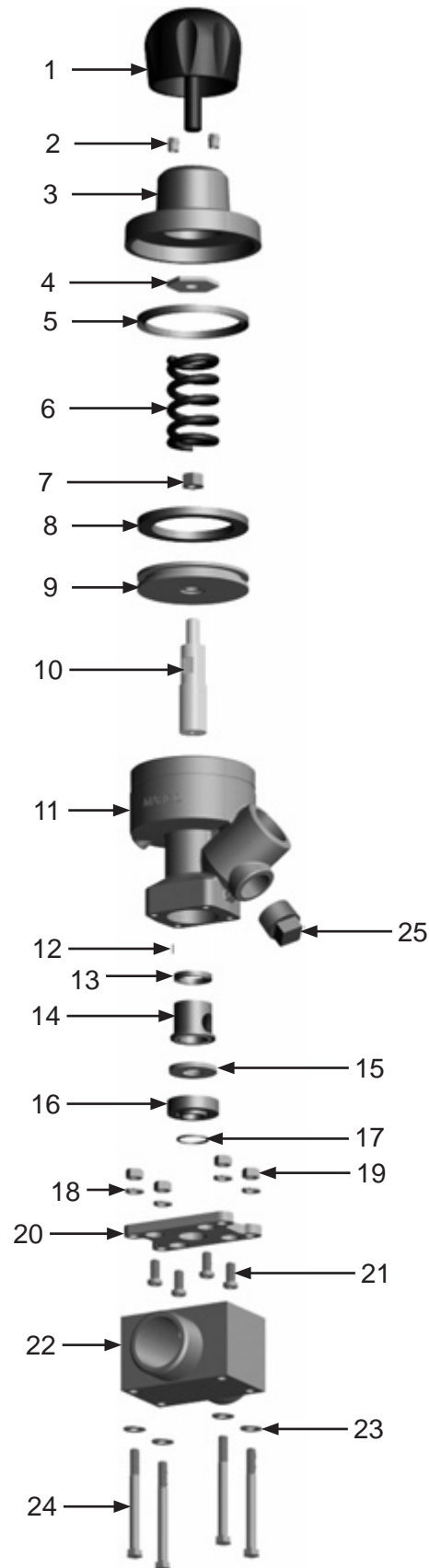
#### **Assemble:**

- 1) Install Piston Seal (8) in groove in Piston (9). Ensure open side of Piston Seal is facing flat side of Piston.
- 2) Place threaded end of Plunger (10) in center hole through bottom of Piston (9). Thread Nut (7) on Plunger. Place a wrench on rectangular Grooves (26) on Plunger and tighten Nut to 70 foot/pounds.
- 3) Lightly lubricate Piston Seal (8) and Body (11) walls with white lithium grease. With Nut (7) facing up, place Piston (9) and Plunger (10) in Body.
- 4) Install Groove Pin (12) in recess. With inner O-ring of Plunger Seal (13) facing up, slide Plunger Seal over Plunger and seat in recess of Body (11).
- 5) Align notch in Tungsten Carbide Sleeve (14) with Groove Pin (12). Place Tungsten Carbide Sleeve on Plunger (10).
- 6) Place Seat (15) in top of Insert (16) with beveled side up. Place O-ring (17) in recess on bottom of Insert. Place assembly on Body (11), aligning with Tungsten Carbide Sleeve (14).
- 7) Install Cap Screws (21) and Adapter Plate (20) to Body (11).
- 8) Install Base (22) on Adapter Plate (20) using Bolts (24), Lock Washers (18), Washers (23), and Nuts (19).
- 9) Install Vibration Disc (4) into Cap (3).
- 10) Apply light film of white lithium grease on all sides of Bump Ring (5) and place on Piston (9).
- 11) Place Spring (6) in Cap (3) and thread onto Body (11). Using a strap wrench, install Cap onto Body, there will be tension from Spring.
- 12) Tighten Bolts (24) to 30 foot/pounds.
- 13) Install two 1/8" Breather Mufflers (2) into Cap (3).
- 14) Install Pipe Plug (25).
- 15) Thread Knob (1) into Cap (3).



# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve — 2" (cont.)



# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Urethane Sleeve — 2”

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-563

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **WARNING**

W-529

Never use compressed air to separate or remove internal components during maintenance. Components could be ejected at high speeds. Failure to comply with the above warning could result in death or serious injury.

Maintenance of the Blastmaster® Maxum III Abrasive Metering Valve – Tungsten Carbide Sleeve is limited to daily cleaning and immediate replacement of damaged or worn parts.

#### **Disassemble:**

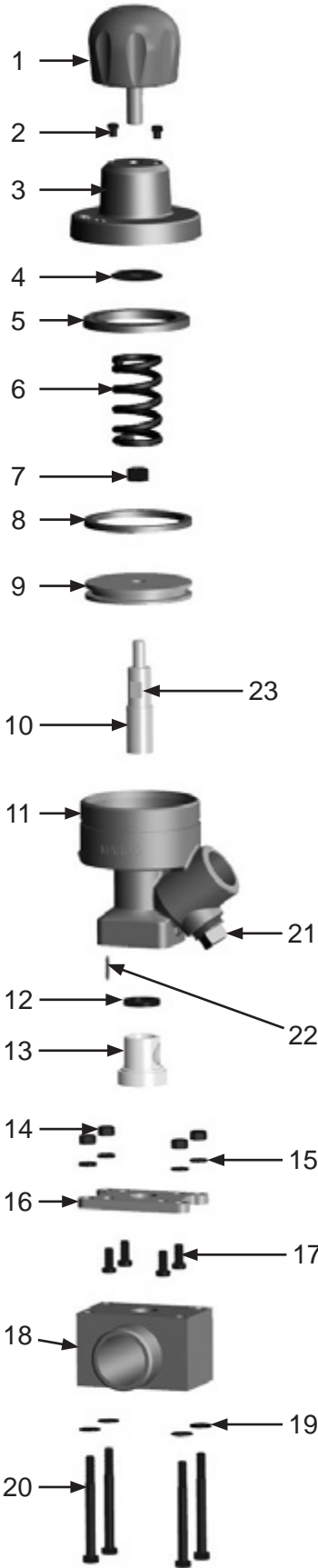
- 1) Remove Knob (1) from Cap (3) by turning counter-clockwise.
- 2) Remove two 1/8" Breather Mufflers (2) from Cap (3)
- 3) Remove Bolts (20), Washers (19), Lock Washers (15), Nuts (14) and Base (18).
- 4) Remove Cap Screws (17) and Adapter Plate (16).
- 5) Remove Urethane Sleeve (13) from Body (10).
- 6) Using a strap wrench, remove Cap (3) by turning counter-clockwise. There will be tension on the Cap from Spring (6).
- 7) Remove Spring (6), Bump Ring (5) and Vibration Disc (4) from Body (11).
- 8) To remove Piston (9), push Plunger (10) through Body (11).
- 9) Remove Pipe Plug (21) from Body (11).
- 10) Remove Plunger Seal (12).
- 11) Remove Groove Pin (22) from Body (11).
- 12) Remove Piston (9) from Plunger (10) by placing wrench on rectangular Grooves (23) on Plunger and remove Nut (7).
- 13) Remove Piston Seal (8) from Piston (9).

#### **Assemble:**

- 1) Install Piston Seal (8) in groove in Piston (9). Ensure open side of Piston Seal is facing flat side of Piston.
- 2) Place threaded end of Plunger (10) in center hole through bottom of Piston (9). Thread Nut (7) on Plunger. Place a wrench on rectangular grooves on Plunger and tighten Nut to 70 foot/pounds.
- 3) Lightly lubricate Piston Seal (8) and Body (11) walls with white lithium grease. With Nut (7) facing up, place Piston (9) and Plunger (10) in Body.
- 4) Install Groove Pin (22) in recess. With inner O-ring of Plunger Seal (13) facing up, slide Plunger Seal over Plunger and seat in recess of Body (11).
- 5) Align notch in Urethane Sleeve (13) with Groove Pin (22). Place Urethane Sleeve on Plunger (10).
- 6) Install Cap Screws (17) and Adapter Plate (16) to Body (11).
- 7) Install Bolts (20), Washers (19), Lock Washers (15), Nuts (14) and Base (18) to Adapter Plate (16).
- 8) Apply light film of white lithium grease on all sides of Bump Ring (5) and place on Piston (9).
- 9) Place Spring (6) in Cap (3) and thread onto Body (11). Using a strap wrench, install Cap onto Body, there will be tension from Spring.
- 10) Tighten Bolts (20) to 30 foot/pounds.
- 11) Install two 1/8" Breather Mufflers (2) into Cap (3).
- 12) Install Pipe Plug (21).
- 13) Thread Knob (1) into Cap (3).

# MAINTENANCE

## Disassemble and Assemble Blastmaster® Maxum III Abrasive Metering Valve – Urethane Sleeve – 2” (cont.)



# MAINTENANCE

## Disassemble and Assemble GateKeeper Air Valve

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-563

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **WARNING**

W-529

Never use compressed air to separate or remove internal components during maintenance. Components could be ejected at high speeds. Failure to comply with the above warning could result in death or serious injury.

### **NOTICE**

N-522

Air flow through the Gatekeeper Air Valve is opposite of the directional arrow located on the Gatekeeper Body. Ensure the Gatekeeper Air Valve is installed with the port labeled AIR INLET closest to the air source.

Maintenance of the GateKeeper Air Valve is limited to the daily cleaning and the immediate replacement of damaged or worn parts.

#### **Disassemble:**

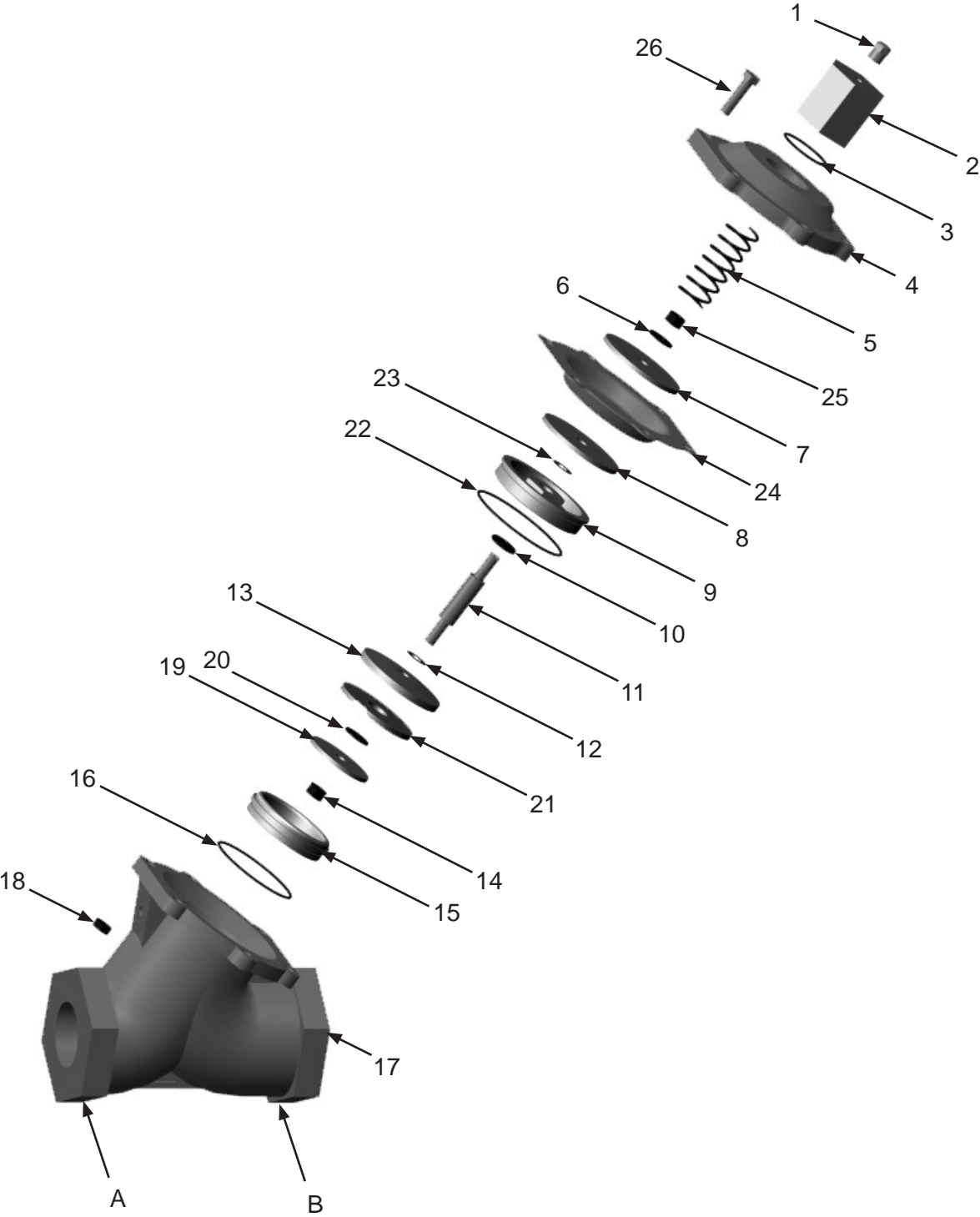
- 1) Remove 1/8" Breather Muffler (1) from Spring Retainer (2).
- 2) Remove Spring Retainer (2) by turning counter-clockwise. There will be tension on the Spring Retainer from Spring (5) as it is removed. Remove Spring Retainer O-ring (3) and Spring.
- 3) Remove four Bolts (26) and Nuts (18).
- 4) Remove Cap (4) from Body (17).
- 5) Grasp Nut (5) and pull up to expose Lock Nut (14) in the inlet chamber of the Body (17). Hold Lock Nut (14) and loosen Nut (5).
- 6) Remove upper Diaphragm Plate (7), Washer (6), Diaphragm (24) lower Diaphragm Plate (8) and Washer (220) from Shaft (11).
- 7) Remove Retainer Bushing (9) using retainer bushing tool (purchased separately). Remove Shaft (11) and Bushing Retainer from Body (17). Remove Shaft from Bushing Retainer (9).
- 8) Remove O-ring (22) from Body (17). Remove Retainer Bushing O-ring (10) from Retainer Bushing (9).
- 9) Remove Lock Nut (14) from Shaft (11). Slide Disc Plate (19) from Shaft. Remove Disc (21), Disc Retainer (13), and Washer (12) from Shaft.
- 10) Using seat tool (purchased separately), remove Seat (15) from Body (17).
- 11) Remove Seat O-ring (16) from Seat (15).

#### **Assemble:**

- 1) Place Seat O-ring (16) in Body (17). Install Seat (15) into Body and tighten using seat tool (purchased separately).
- 2) Place Washer (12), upper Disc Retainer (13), Disc (21), and lower Disc Retainer (19) on Shaft (11). Install Lock Nut (14) on Shaft and tighten.
- 3) Insert Retainer Bushing O-ring (10) in Retainer Bushing (9).
- 4) Lubricate Shaft (11) with white lithium grease. Slide Shaft into Retainer Bushing (9).
- 5) Insert O-ring (22) into Body (17).
- 6) Insert assembled Shaft (11) and Retainer Bushing (9) into Body (17). Using retainer bushing tool (purchased separately), tighten Retainer Bushing.
- 7) Install Washer (23) on Shaft (11), place lower Diaphragm Plate (8) on Shaft. Place Diaphragm (24) on Shaft.
- 8) Place upper Diaphragm Plate (7) on Shaft (11). Install Nut (25) on Shaft and tighten.
- 9) Align holes at corners of Diaphragm (24) with holes in Body (17).
- 10) Place Cap (4) on Body (17). Insert Bolts (26) in corner holes of Cap. Install Nut (16) on Bolt. Tighten Nuts in a star pattern.
- 11) Place Spring (5) into hole in Cap (4).
- 12) Place Spring Retainer O-ring (3) over threads of Spring Retainer (2). Install Spring Retainer (2) into Cap (4) and tighten.
- 13) Install 1/8" Breather Muffler (1) into of Spring Retainer (2).
- 14) Place the assembled valve with the arrow located on the body facing to the right. Adhere Air Outlet Sticker on Valve Body (17) at location (A).
- 15) Place the assembled valve with the arrow located on the body facing to the right. Adhere Air Inlet Sticker on Valve Body (17) at location (B).

# MAINTENANCE

## Disassemble and Assemble GateKeeper Air Valve (cont.)



# MAINTENANCE

## Disassemble and Assemble Pneumatic Solenoid

Maintenance of the Pneumatic Solenoid is limited to the daily cleaning and the immediate replacement of damaged or worn parts.

### WARNING

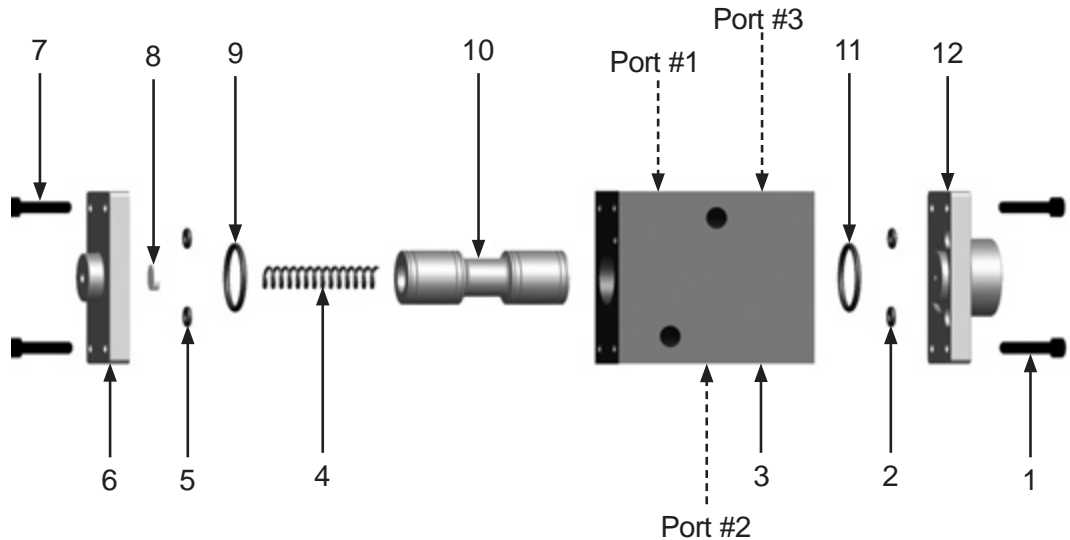
W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### WARNING

W-522

Verify your remote control system is designed to function as normally-closed. Use of this assembly with a normally-open remote control system could cause unintended activation of the remote control system resulting in the release of high speed abrasive and compressed air. Failure to comply with the above warning could result in death or serious injury.



### Disassemble:

- 1) Remove four Screws (7) from End Cap (6). Remove Spring (4) from Valve Body (3).
- 2) Remove large O-ring (9) and two small O-rings (5) from End Cap (6).
- 3) Remove Felt (8) from End Cap (6).
- 4) Remove four Screws (1) from Air Pilot (12).
- 5) Remove large O-ring (11) and two small O-rings (2) from Air Pilot (12).
- 6) Ease Plunger (10) from Valve Body (3) by pushing Plunger (10) from Air Pilot (12) end.

### Assemble:

- 1) Orient the Valve Body (3) so Port #1 and Port #3 are facing to the left. Insert Plunger (10) in Valve Body (3) from the left.
- 2) Place large O-ring (11) and two small O-rings (2) in Air Pilot (12).
- 3) Install four Screws (1) to secure Air Pilot (12) to Valve Body (3). Do not over-tighten.
- 4) Place two small O-rings (5) and large O-ring (9) in End Cap (6).
- 5) Insert Felt (8) in center recess of End Cap (6).
- 6) Insert Spring (4) in Valve Body (3). Place End Cap (6) on Spring (4) and compress spring until End Cap (6) meets Valve Body (3).
- 7) Install four Screws (7) in End Cap (6) and tighten. Do not over-tighten.

### WARNING

W-505

Inspect all equipment for wear or damage before and after each use. Failure to use Original Equipment Manufacturer repair parts and failure to immediately replace worn or damaged components could void warranties and cause malfunctions. Failure to comply with the above warning could result in death or serious injury.

# MAINTENANCE

## Disassemble and Assemble Electric Solenoid

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

### **WARNING**

W-522

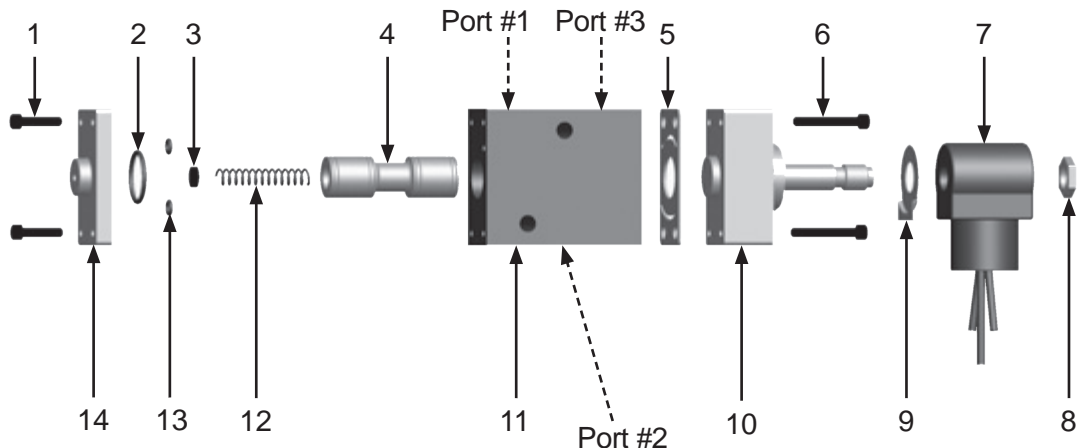
Verify your remote control system is designed to function as normally-closed. Use of this assembly with a normally-open remote control system could cause unintended activation of the remote control system resulting in the release of high speed abrasive and compressed air. Failure to comply with the above warning could result in death or serious injury.

### **WARNING**

W-505

Inspect all equipment for wear or damage before and after each use. Failure to use Original Equipment Manufacturer repair parts and failure to immediately replace worn or damaged components could void warranties and cause malfunctions. Failure to comply with the above warning could result in death or serious injury.

Maintenance of the Electric Solenoid is limited to the daily cleaning and the immediate replacement of damaged or worn parts.



### **Disassemble:**

- 1) Remove four Screws (1) from End Cap (14). Remove Spring (12) from Valve Body (11).
- 2) Remove large O-ring (2) and two small O-rings (13) from End Cap (14).
- 3) Remove Felt (3) from End Cap (14).
- 4) Remove Nut (8) Slide Coil and Coil Housing (7) from Pilot (10). Remove Coil Washer (9).
- 5) Remove four Screws (6) from Pilot (10). Remove Gasket (5).
- 6) Ease Plunger (4) from Valve Body (11) by pushing Plunger (12) from Pilot (10) end.

### **Assemble:**

- 1) Orient the Valve Body (11) so Port #1 and Port #3 are facing away. Insert Plunger (4) in Valve Body (11) from the left.
- 2) Place Gasket (5) on Valve Body (11) on the right. Place Pilot (10) on Gasket (5).
- 3) Ensure port in side of Pilot (10) is on the same side as Port #2 of Valve Body (11).
- 4) Install four Screws (6) to secure Pilot (10) to Valve Body (11). Do not overtighten.
- 5) Place Coil Washer (9) over stem of Pilot (10). Slide Coil and Coil Housing (7) onto stem of Pilot (10). Install Nut (8) on stem of Pilot (10). Do not overtighten.
- 6) Place two small O-rings (13), large O-ring (2), and Felt (3) in End Cap (14).
- 7) Insert Spring (12) in Valve Body (11). Place End Cap (14) on Spring (12) and compress Spring (12) until End Cap (14) meets Valve Body (11).
- 8) Install four Screws (1) in End Cap (14). Do not overtighten.

# MAINTENANCE

## Disassemble and Assemble 120-Volt AC to 12-Volt AC Power Converter

Maintenance of the Marco 120-Volt AC to 12-Volt AC Power Converter is limited to the daily cleaning and the immediate replacement of damaged or worn parts.

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

#### ***Disassemble:***

- 1) Disconnect power source from power converter.
- 2) Loosen four screws on cover of power converter enclosure and remove cover.
- 3) Remove two nuts securing transformer to enclosure, and remove transformer.
- 4) Disconnect and retain wires from transformer.

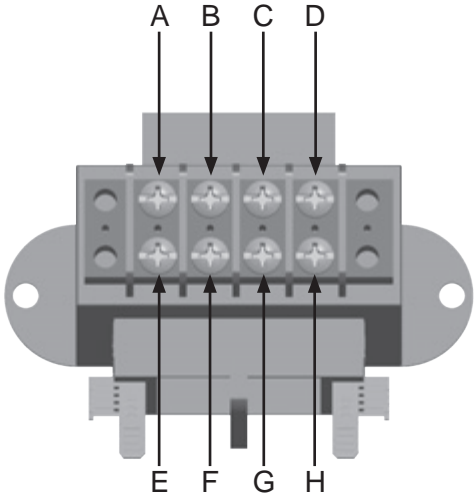
#### ***Assemble:***

- 1) Connect retained wires to transformer using the Wiring Connection Guide.
- 2) Install transformer in enclosure, and secure it using two nuts.
- 3) Install cover on power converter enclosure and tighten four screws.

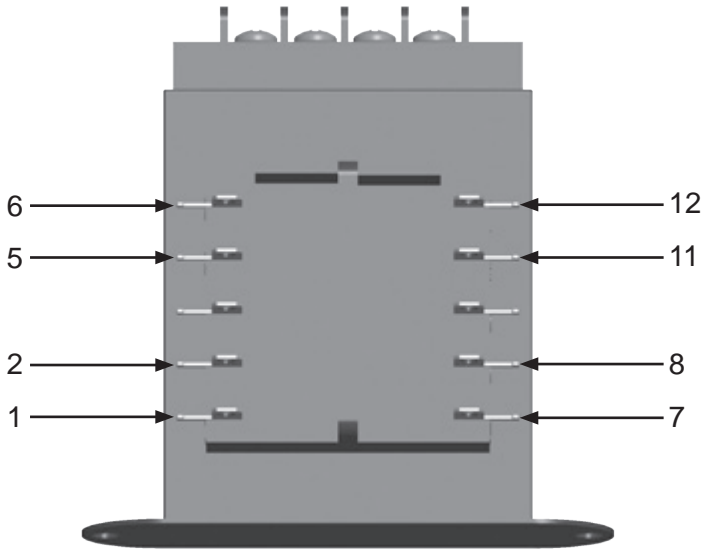


# MAINTENANCE

## Disassemble and Assemble 120-Volt AC to 12-Volt AC Power Converter (cont.)



Wiring Connection Guide		
A	connects to	Black Wire In
B	connects to	White Wire In
C	connects to	Black Wire Out
D	connects to	White Wire Out
E	connects to	5
E	connects to	1
F	connects to	6
F	connects to	2
G	connects to	7
H	connects to	12
11	connects to	8



# MAINTENANCE

## Disassemble and Assemble Blastmaster® 190 Electric Remote Control Assembly

### **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

Maintenance of the Blastmaster® 190 Electric Remote Control Assembly is limited to the daily cleaning and the immediate replacement of damaged or worn parts.

### **Disassemble:**

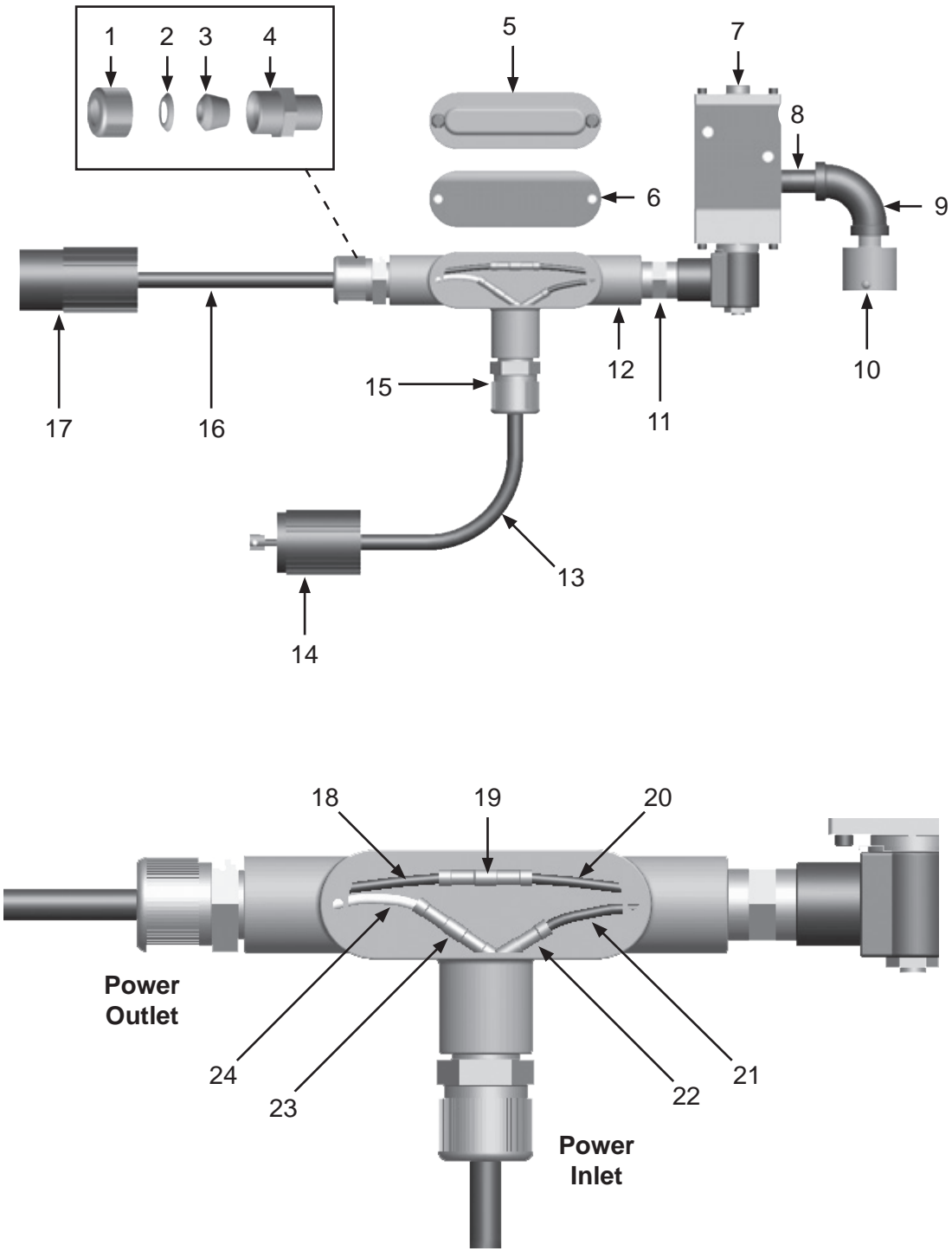
- 1) Remove Female Twist-Lock Plug (17), and Male Twist-Lock Plug (14).
- 2) Remove Dust Eliminator (10), Pipe Elbow (9), and Pipe Nipple (8) from Electric Solenoid (7).
- 3) Remove Cover (5) and Gasket (6).
- 4) Cut Black Wire (18) and Wire (20) and remove Butt Splicer (19).
- 5) Cut White Wire (24), Wire (21), and remove two Butt Splicers (22, 23) from Power Inlet Power Cord (13).
- 6) Remove Threaded Cap (1), Washer (2), Grommet (3), and 1/2" Hex Nipple (4), then remove Power Cord (16) from Conduit Box (12). Repeat for Cord Grip (15) and Power Cord (13).
- 7) Remove Electric Solenoid (7) from 1/2" Hex Nipple (11).
- 8) Remove 1/2" Hex Nipple (11) from Conduit Box (12).

### **Assemble:**

- 1) Cut the green ground wire, of the Electric Solenoid (7), at the base of the Coil Housing and install a Butt Splicer on the wire.
- 2) Insert wires of Pilot Valve Assembly (7), into 1/2" Hex Nipple (11), and tighten Electric Solenoid (7) onto 1/2" Hex Nipple (12).
- 3) Insert two wires through end of Conduit Box (12). Install Conduit Box (12) on 1/2" Hex Nipple (11) and tighten.
- 4) Install Cord Grip Hex Nipple (4) in Conduit Box (12) opposite Electric Solenoid (7).
- 5) Install Grommet (3), Washer (2), and Threaded Cap (1) on Power Cord (16).
- 6) Remove three inches of cover from Power Cord (16) to expose wires. Insert exposed wires through Cord Grip Hex Nipple (4). Repeat for Cord Grip (15) and Power Cord (13).
- 7) Install Butt Splicer (19) on Black Power Outlet Wire (18). Install Pilot Valve Wire (20) in Butt Splicer (19), and crimp wires in place.
- 8) Install Butt Splicer (23) on White Power Outlet Wire (24). Install White Power Inlet Wire in Butt Splicer (23) and crimp wires in place.
- 9) Install Butt Splicer (22) on Pilot Valve Wire (21). Install Black Power Inlet Wire in Butt Splicer (22), and crimp wires in place.
- 10) Install Male Twist-Lock Plug (14) on Power Cord (13).
- 11) Install Female Twist-Lock Plug (17) on Power Cord (16).
- 12) Install Gasket (6), and Cover (5) on Conduit Box (12). Do not overtighten screws.
- 13) Install Pipe Nipple (8), Pipe Elbow (9), and Dust Eliminator (10) on Electric Solenoid (7). Do not overtighten.

# MAINTENANCE

## Disassemble and Assemble Blastmaster® 190 Electric Remote Control Assembly (cont.)



# MAINTENANCE

## Maintenance Schedules Quick Reference Charts

### BLAST POT MAINTENANCE SCHEDULE

Perform inspections at the intervals specified. Repair or replace damaged parts as needed.

Item	Maintenance Required	Daily	Weekly	Monthly
Blast Pot Exterior	Visually inspect exterior of blast pot for any damage (corrosion, dents, bulges, cracks etc.). Remove from service and contact Marco.	x		
Blast Pot External Piping & Pipe Fittings	Visually inspect external pipe & pipe fittings for damage (wear, cracks, air leaks etc.). Replace as needed.	x		
Pop-up Valve and Pop-up Valve Seat	Visually inspect sealing surfaces, alignment and gap between Pop-up valve seat and Pop-up valve. Repair or replace as needed.	x		
Exhaust Muffler	Visually inspect muffler components for wear and abrasive. Empty any abrasive. Repair or replace as needed.	x		
Inspection Door Assembly	Visually inspect condition of gasket and sealing surfaces. Ensure all components are tight. Replace as needed.		x	
Identification Tags and Decals	Visually inspect for presence and condition of all identification tags and decals. Replace as needed.		x	
Blast Pot Interior	Visually inspect interior surfaces of the blast pot for wear, corrosion, pitting, cracks, or other damage. Remove from service and contact Marco. Check internal piping for wear or damage. Replace as needed.			x
Blast Pot	Hydrostatic Test	Every 5 years unless otherwise directed by local, state, or jurisdictional requirements.		

# TROUBLESHOOTING

If the Blastmaster® 20 Cu. Ft. Abrasive Blasting Pot does not function properly, check the following:

## WARNING

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

## WARNING

W-511

For equipment manufactured by entities other than Marco, you must consult the Original Equipment Manufacturer operator's manuals, information, training, instructions and warnings, for the proper and intended use of all equipment. Failure to comply with the above warning could result in death or serious injury.

## WARNING

W-563

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **SYMPTOM (Cause)**

### **ACTION**

#### **Abrasive Blasting Pot will not pressurize**

*(Damaged components, Improper Air Supply, Remote Control System)*

Insufficient air supply. Ensure a minimum of 50 psi is supplied to Blast Pot and sufficient air volume to support blast nozzle.

Ensure internal piping is aligned with fill hole.

Ensure pop-up valve and pop-up valve seat are seating without air leaks. Replace damaged components.

#### **Blast Pot will not depressurize or depressurizes slowly**

*(Damaged components)*

Inspect Blast Pot Exhaust Muffler for debris. Clean or replace Element.

#### **No Air or Abrasive exits the Blast Nozzle**

*(Blockages, Wet Abrasive, Abrasive Metering Valve)*

Depressurize Blast Pot. Inspect blast nozzle and abrasive blasting hose for blockage. Remove blockage or remove components from use.

Pressurize Blast Pot using the remote control system and open and close choke valve rapidly. If problem persists refer to abrasive metering valve Operator's Manual.

#### **Intermittent abrasive flow**

*(Wet Abrasive, Abrasive Metering Valve, Blast Nozzle)*

Damp or wet abrasive. Remove abrasive from Blast Pot by cleaning out the vessel. Ensure dry abrasive is used.

Install a moisture separator at the inlet of the Blast Pot. Increase the inner diameter of air supply hose.

Blast nozzle is worn or too large for compressor size. Replace blast nozzle.

#### **Only abrasive exits Abrasive Blasting Nozzle**

*(Damaged , Pneumatic Control Lines, Choke Valve)*

Inspect control lines for restrictions, leaks, and correct routing. Repair or replace damaged components.

Inspect GateKeeper Air Valve for damage. Replace damaged components.

Ensure choke valve is in the OPEN position. See blast pot Operator's Manual.

# TROUBLESHOOTING

## **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

## **WARNING**

W-511

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## **WARNING**

W-563

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## **SYMPTOM (Cause)**

### **Air and abrasive does not exit the Abrasive Blasting Nozzle**

*(Air Supply, Blockages, Pneumatic Control Lines, Pilot Valve, Remote Control Switch)*

## **ACTION**

Insufficient air supply. Ensure minimum of 50 PSI is supplied to abrasive blasting pot and sufficient air volume to support abrasive blasting nozzle.

Inspect control lines for restrictions, leaks, and correct routing. Repair or replace damaged components.

Inspect pilot valve for damage. Repair or replace as necessary.

Inspect solenoid for damage. Repair or replace as necessary.

See remote control switch Operator's Manual.

### **Only air exits Abrasive Blasting Nozzle**

*(Abrasive Metering Valve, Pneumatic Control Lines)*

Inspect control lines for restrictions, leaks, and correct routing. Repair or replace damaged components.

Insufficient air supply. Ensure minimum of 50 psi is supplied to Blastmaster® Maxum III Abrasive Metering Valve.

Ensure Blastmaster® Maxum III Abrasive Metering Valve abrasive inlet port is clear of obstructions. Clean area and ensure abrasive is free of debris, properly screened and free of moisture.

Set metering knob.

Ensure air is not escaping from Breather Mufflers in Blastmaster® Maxum III Abrasive Metering Valve. Inspect Blastmaster® Maxum III Abrasive Metering Valve for damaged components and ensure nut securing piston to plunger is tightened to 70 foot/pounds.

Inspect Abrasive Metering Valve for damage. Replace damaged components.

# TROUBLESHOOTING

## **WARNING**

W-562

Always depressurize the entire system, disconnect all power sources and lockout/tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

## **WARNING**

W-511

For equipment manufactured by entities other than Marco, you must consult the Original Equipment Manufacturer operator's manuals, information, training, instructions and warnings, for the proper and intended use of all equipment. Failure to comply with the above warning could result in death or serious injury.

## **WARNING**

W-563

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

### **SYMPTOM (Cause)**

#### **Air and abrasive exit Abrasive Blasting Nozzle when Remote Control Switch is in OFF position**

*(Remote Control Switch, Pneumatic Control Lines, Pilot Valve)*

### **ACTION**

Ensure a "non-bleeder" style pneumatic remote control switch is installed. Install a "non-bleeder" style pneumatic remote control switch.

Inspect pneumatic pilot valve for damage. Repair or replace pneumatic pilot valve.

Inspect electric solenoid for damage. Repair or replace electric solenoid.

See remote control switch Operator's Manual.

#### **Air exits Abrasive Blasting Nozzle when Remote Control Switch is in OFF position**

*(Pneumatic Control Lines, Damaged GateKeeper Air Valve components)*

Inspect control lines for restrictions, leaks and correct routing. Repair or replace damaged components.

Ensure the GateKeeper Air Valve is installed with the port labeled AIR INLET closest to the air source.

Inspect GateKeeper Air Valve for damaged components. Repair or replace damaged components.

See remote control switch Operator's Manual.

#### **Abrasive exits Abrasive Blasting Nozzle when Remote Control Switch is in the OFF position**

*(Pneumatic Control Lines, Damaged Abrasive Metering Valve components)*

Inspect control lines for restrictions, leaks, and correct routing. Repair or replace damaged components.

Inspect abrasive metering valve for damage.

Ensure an air-actuated abrasive metering valve is installed. Install an air-actuated abrasive metering valve.

Ensure Breather Mufflers in cap of Blastmaster® Maxum III Abrasive Metering Valve are not blocked. Replace Breather Mufflers if blocked.

Inspect Blastmaster® Maxum III Abrasive Metering Valve for damaged components. Repair or replace Blastmaster® Maxum III Abrasive Metering Valve.

See remote control switch Operator's Manual.

# MAINTENANCE NOTES

DATE	TYPE OF SERVICE	PART NUMBER







## ADDITIONAL TECHNICAL DATA

The associations listed below offer information, materials and videos pertaining to abrasive blasting and safe operating practices.

- **American Society for Testing and Materials (ASTM)**  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959  
Phone: (610) 832-9585  
FAX: (610) 832-9555  
www.astm.org
- **Occupational Safety & Health Administration (OSHA)**  
United States  
Department of Labor  
200 Constitution Avenue  
Washington, DC 20210  
Phone: (800) 321-OSHA  
(800) 321-6742  
www.osha.gov
- **The National Board of Boiler & Pressure Vessel Inspectors**  
1055 Crupper Avenue  
Columbus, Ohio 4322  
Phone: (614) 888-8320  
FAX: (614) 888-0750  
www.nationalboard.org
- **National Association of Corrosion Engineers (NACE)**  
1440 South Creek Drive  
Houston, TX 77084-4906  
Phone: (281) 228-6200  
FAX: (281) 228-6300  
www.nace.org
- **The Society for Protective Coatings (SSPC)**  
40-24th Street, 6th Floor  
Pittsburgh, PA 15222-4656  
Phone: (412) 281-2331  
FAX: (412) 281-9992  
www.sspc.org
- **American National Standards Institute (ANSI)**  
1899 L Street, NW, 11th Floor  
Washington, DC 20036  
Phone: (202) 293-8020  
FAX: (202) 293-9287  
www.ansi.org

## Limited Warranty:

Seller warrants to the original Purchaser that any MARCO manufactured product covered by this Limited Warranty will remain free from defects in workmanship or material under normal commercial use and service for a period of one year from the date of shipment to the original Purchaser. This Warranty shall not apply to defects arising, in whole or in part, from any accident, negligence, alteration, misuse or abuse of the Product, operation of the Product which is not in accordance with applicable instructions or manuals or under conditions more severe than, or otherwise exceeding, those set forth in the written specifications for the Product, nor shall this Warranty extend to repairs or alterations of the Product and/or any maintenance part by persons other than Seller or Seller's authorized representatives. This warranty does not apply to accessory items or third-party manufactured product. Further, this Warranty does not apply to damage or wear to the surface finish or appearance of the Product or normal wear and tear to the Product. This Warranty is limited to a purchaser who purchases the Product either directly from the Seller or from one of Seller's "Authorized Distributors". An Authorized Distributor is a Seller approved distributor that purchases the Product directly from the Seller for the sole purpose of re-selling the Product at retail, without any use or modifications whatsoever, to an end-purchaser. This warranty is specifically non-assignable and non-transferable. All third-party manufactured product will be covered by original manufacturer warranties.

## Disclaimer of Warranty:

This warranty is exclusive and, except as stated herein, MARCO makes no express or implied warranties as to any matter whatsoever, including, without limitation, the warranty of merchantability and fitness for a particular, which exceed the foregoing warranty. Purchaser's sole remedy and MARCO's sole obligation arising out of or in connection with defects in materials, workmanship or services, which are based on warranty, contract, negligence, strict liability or otherwise, shall be those stated in the following Section 4. The Purchaser acknowledges that any affirmation of fact or promise made by MARCO shall not be deemed to create an express warranty, that Purchaser is not relying on MARCO's skill or judgment in selecting or furnishing a system suitable for any particular purpose, and there are no warranties which extend beyond the description on the face hereof.

## Exclusive Remedy for Warranty Claims:

The sole and exclusive remedy under the foregoing limited warranty, and to the extent permitted by law, any warranty or condition implied by law, covering this product shall be, at the seller's option, the repair or replacement, free of charge, F.O.B. point of manufacture, of any defective part or parts of the product that were manufactured by seller, and which are returned to seller at seller's principal place of business, postage prepaid by the Purchaser. This sole and exclusive remedy is conditioned upon Purchaser's prompt written notice to seller at seller's place of business that a defect has been discovered, together with a reasonably detailed description of the defect in the product, proof of purchase of the product, and the model and identification number of the product within thirty (30) days after discovery of the defect, otherwise such claims shall be deemed waived. No allowance will be granted for any repairs or alterations made by Purchaser or others without seller's prior written consent. If such notice is timely given, seller will have the option to either modify the product or component part thereof to correct the defect, replace the product or part with complying products or parts, or refund the amount paid for the defective product, any one of which will constitute the sole liability of seller and full settlement of all claims. In no event shall seller be liable for any obligation greater than the original purchase price of the product under this warranty. Purchaser shall afford seller prompt and reasonable opportunity to inspect the product for which a claim is made. The sole purpose of the foregoing stipulated exclusive remedy shall be to repair or replace defective products or components thereof or to refund purchaser the purchase price thereof. This stipulated exclusive remedy shall not be deemed to have failed of its essential purpose so long as seller is willing and able to repair or replace the defective parts or refund the purchase price in accordance with the terms hereof. Products that have been repaired or replaced under this warranty do not receive a new warranty and are only covered by the remaining portion of the original warranty.

## Limitation of Remedies:

The foregoing stipulated exclusive remedy is in lieu of all other remedies for breach of contract, warranty, and/or tort or otherwise. Seller shall not be liable, either directly or indirectly, for any consequential, incidental or special losses or damages of Purchaser, including but not limited to the Purchaser's expenses for downtime or for making up downtime, damages for which the Purchaser may be liable to other persons and/or entities, damages to property, and injury to or death of any persons and/or any claims for incidental or consequential damages, including but not limited to loss of profits, regardless of whether Seller has been informed of the possibility of such damages. Seller neither assumes, nor authorizes any person to assume for it, any other liability in connection with the sale or use of any Products covered by the foregoing Warranty and Disclaimers, and there are no oral agreements relating to remedies which are collateral to or which affect this limitation.

## CONTACT CENTER

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