OPERATING INSTRUCTIONS

U300 / U600 / U1000

UltraBlast Portable Blast Machine

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MADE IN THE USA

Operating Instructions For

UltraBlast Portable Blast Machine

Package A	Package B	Package C
		
* **UltraBlast Machine** * **Deadman** * **Twin-Line**	* **UltraBlast Machine** * **Deadman** * **Twin-Line** * **Blast Hose w/ Couplings (50')** * **Tungsten Carbide Blast Nozzle**	* **UltraBlast Machine** * **Deadman** * **Twin-Line** * **Blast Hose w/ Couplings (50')** * **Tungsten Carbide Blast Nozzle** * **Nova 2000 Respirator (Blast Helmet)** * **Radex Airline Filter** * **50' Breathing Air Supply Hose** * **Double Palm Leather Blasting Gloves**

Titan Abrasive

PO Box 750

Montgomeryville, PA 18936

215-310-5055

Important Warning

SILICA SAND IS NOT TO BE USED IN ANY TITAN BLAST EQUIPMENT.

Safety Precautions

 **WARNING** 

Failure to follow all the manufacture's instructions for operator safety equipment and blast equipment could result in serious injury or death.

Read this manual completely before installing and operating the UltraBlast Machine.

For maximum operator safety, use protective equipment. NIOSH/OSHA require the use of a respirator (air-fed blast helmet) with proper air supply, remote controls, cape, blast suit, and leather gloves.

OSHA requires that the air-fed blast helmet be equipped with a personal air line filter, grade "D" compressed air, and CO monitor or an ambient air pump. (For safety equipment see page 53)

Always use safety pins when joining blast hose to blast hose and blast hose to tank connections. (For safety pins see page 52)

Always check filters *before* blasting.

Ensure that there is an adequate air supply to both the operator's helmet and the blast system.

SAFETY NOTE

Operating instructions for operator safety equipment, such as (air-fed blast helmets), personal air line filters, and ambient air pumps, are provided separately.

Table of Contents

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1 Introduction

1.1 Contents of this Manual

This manual covers the operation and maintenance of the Titan Abrasive UltraBlast Portable Blast Machines.

- UltraBlast 300 equiped with automatic controls
- UltraBlast 600 equiped with automatic controls

Read this manual carefully and keep it handy for future reference.

1.2 Additional Information

If you have any questions regarding the operation or maintenance of your Titan Abrasive equipment, please contact Titan at (215)-310-5055.

U300 **U600**

UltraBlast Portable Machines

1.3 NOTES:

UltraBlast 300 / 600 Machine

2

2.1 Description

The UltraBlast U300 / U600 with Pressure-Release Controls is illustrated in *Figure 2-1* and the parts list is provided in *Table 2-1*. Reference numbers in *Figure 2-1* correspond to the numbered items in *Table 2-1*.

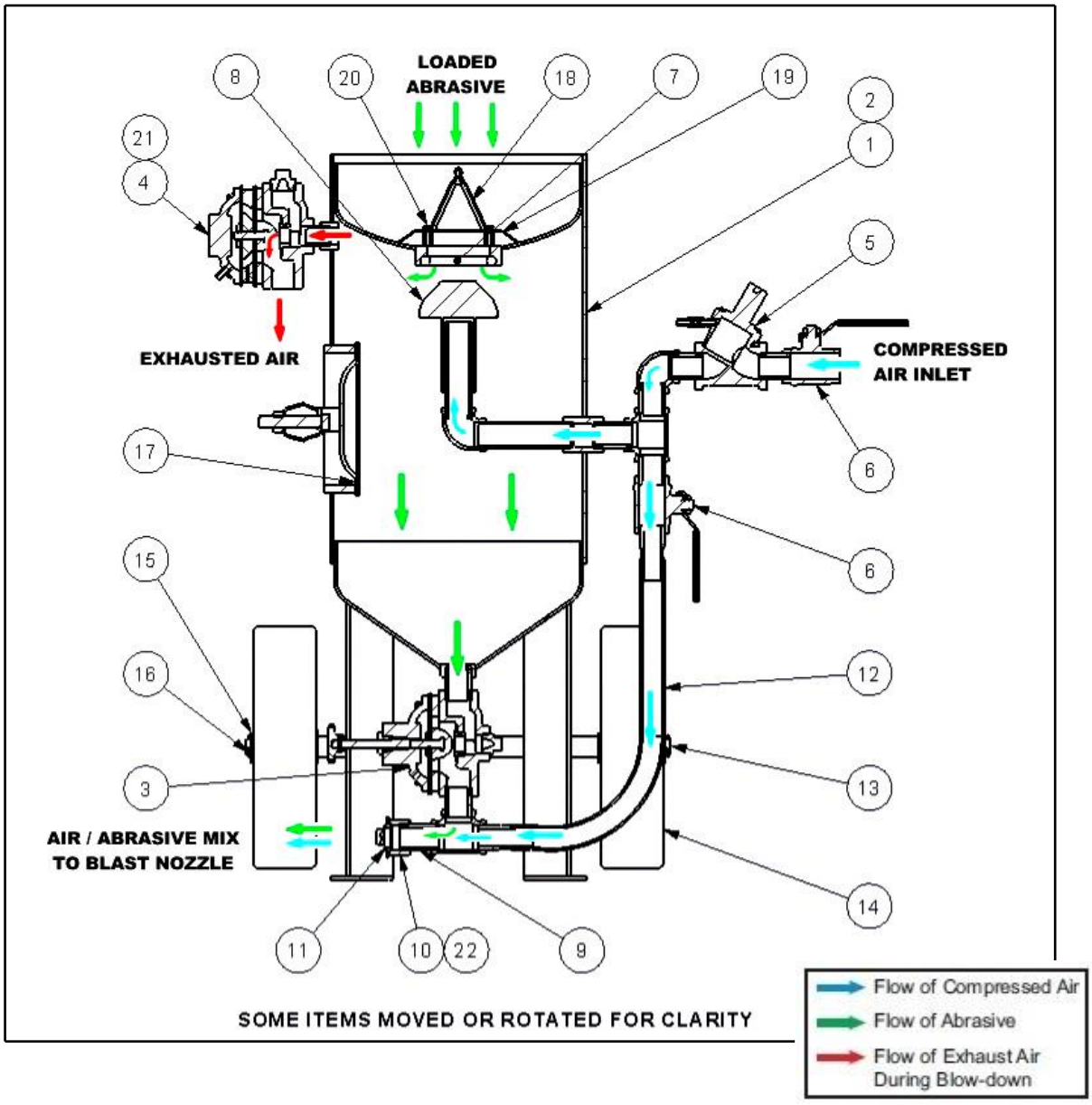


Figure 2-1 UltraBlast 300 / 600 Machine

Table 2-1 Part List for the UltraBlast 300 / 600 Machine

Ref.	Part Number	Description
1	300 PV 600 PV	3.0 Pressure Vessel 6.0 Pressure Vessel
2	HPV	Handle – Pressure Vessel
3	5800	Valve – Abrasive Regulator
4	5720	Valve – Exhaust
5	IV – 125	Valve – Inlet
6	4027	Valve – Air
7	SG – 1	O-Ring
8	SP – 1	Plunger
9	1713	Pipe Nipple 1-1/4”
10	TC – 125	Tank Coupling 1-1/4”
11	BHCG	Gasket TC 1-1/4”
12	PUSH125-3 PUSH125-6	Pusher Line 1-1/4” x 24” (U300) Pusher Line 1-1/4” x 33” (U600)
13	AXLE – 300 AXLE - 600	Axle – Wheel 300 Axle – Wheel 600
14	1609	Wheel
15	AWW	Washer – Wheel
16	APW	Pin – Wheel
17	1614	Gasket – Hand Hole
18	BBK	Bag Breaker Kit
19	SCREEN	Screen
20	UMBRELLA	Umbrella Assy
21	E MUFFLER	Muffler – Exhaust
22	SCL	Safety Pin – Blast Hose

2.2 Principles of Operation

TITAN UltraBlast blast machines start blasting when the control handle “Deadman” is depressed and stop blasting when the control handle “Deadman” is released.

Pressure-Release Remote Control (PRRC)

The UltraBlast Pressure-Release Remote Control System pressurizes the vessel and starts blasting when the control handle is depressed and de-pressurizes the vessel and stops blasting when the control handle is released.

Pressure-Hold Remote Control (PHRC)

The UltraBlast Pressure-Hold Remote Control System starts blasting when the control handle is depressed and stops blasting when the control handle is released. The vessel is manually pressurized and de-pressurized.

(Refer to Section 3 for more details)

2.3 Set-Up

GENERAL PREPARATION

1. **BLAST HOSE COUPLINGS** – If couplings are not already installed they should be attached to the hose using the sheet metal screws provided. The hose end must be cut clean and square or the service life of the hose, couplings and nozzles will be significantly reduced. Make sure the blast hose coupling gaskets are in place and in good working condition. Connect the blast hose coupling to the tank coupling at connection point “A” on (Page 23). Press the coupling faces firmly together and rotate in a clockwise motion until the locking lugs are engaged. The couplings are locked in the proper position when the 1/8” drilled holes are aligned to allow the insertion of safety wires or clips which should be used to prevent the couplings from unlocking. See the coupling Installation Diagram below for more details.

CUT HOSE SQUARE

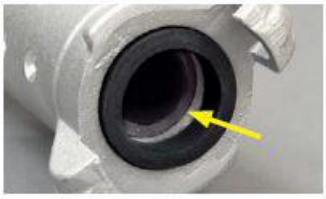
Using a hose cutter, cut the blast hose square. This is an important step to prevent future coupling failures and leaks. **Hose ends are not square from the factory.**

INSTALL COUPLING / NOZZLE HOLDER

Lightly lubricate the blast hose where the coupling / nozzle holder will be installed. Twist the coupling / nozzle holder onto the hose.

COUPLINGS: The blast hose must be inserted until it bottoms out completely.

NOZZLE HOLDERS: The blast hose must be inserted until it is flush with the bottom of the threads.



After installing the coupling / nozzle holder, check that the blast hose is flush against the coupling all the way around verifying it has been cut square and inserted completely.

INSTALL SCREWS

Using a power drill, install screws. Continue to spin screws 2-3 turns beyond the screw head meeting the coupling / nozzle holder to ensure the hose is pulled tight against the wall of the coupling. (You can check this by looking down the inside of the hose and checking for any spots bulging inward)

2.3 Set-Up

GENERAL PREPARATION

2. **BLAST NOZZLE** – Before installing in the nozzle coupling the threads should be coated with an anti-seize compound. Make sure there is a nozzle gasket between the hose and nozzle and tighten then add an extra ¼ turn. DO NOT OVER TIGHTEN!

3. **MAIN AIR SUPPLY** – Use a minimum of 1-1/4" supply air line. **(Do Not Exceed 100 ft.)** Connect the hose to the blast machine at the connection point marked compressed air inlet in Figure 2-1.

4. **GROUNDING** – In order for the blast hose to properly discharge the static electricity generated by the abrasive flow, the blast tank must be grounded. In most cases the unit will be well grounded simply by sitting on a normal surface, however, if the operator experiences discomfort from the static discharge connect a wire from a tank support leg to a known ground point.

5. **REMOTE CONTROL SYSTEM** – Attach the open ends of the TWIN-LINE to the open threaded fittings. Refer to the diagram for your system for the correct location in (Section 3). The connections are different sizes to prevent improper connections. Attach the 6100 DEADMAN CONTROL SWITCH to the blast hose at a comfortable point near the nozzle, however, for safe operations the Switch should not be more than six inches from the nozzle coupling. The TWIN-LINE should be strapped to the blast hose so the twin line is neither crushed or separated from the blast hose when turned.

2.3 Set-Up

Refer to Figure 2-1. Use the following procedure to set up the UltraBlast 300 / 600 machine.

Step	Procedure
1	Remove the inspection door and remove any debris that may have fallen into the pressure vessel cone. This will eliminate potential media blockage at initial start-up.
2	Locate the Manual media valve with tank coupling at the bottom of the tank. Connect the blast hose with coupling to the tank coupling. Ensure that each coupling has a rubber washer and a safety pin installed for safe operation.
3	Screw the nozzle into the threaded nozzle coupling until it seats and seals on the included washer. Hand tight is sufficient.
4	Prepare the remote control system for installation using either a) or b) below: a) If your UltraBlast machine is equiped with pneumatic remote controls, it is supplied with twin-line hose. Connect the twin-line hose to the remote control handle and the appropriate fittings on the vessel pipe string. The connections are different sizes to prevent improper connection. b) If your UltraBlast machine is equipped with electrial remote controls, it is supplied with two lengths of electric cord. Connect the 20-foot line cord with clips to a 12-volt D.C. electric power source. Plug the 55-foot length of cord into the operator's remote control handle and the electric box receptacle attached to the vessel handle or leg.
5	Attach deadman handle to the blast hose just behind the nozzle coupling. The brass fittings or electrical plug must be facing away from nozzle.
6	Starting 18" to 24" from the handle, tape the twin-line hose or line cord to the blast hose approximately every four feet. Friction tape, duct tape, ty-wraps or similar material can be used. Leave slack in the control line between the handle and the first point of attachment.
7	The exhaust valve is normally open. Open choke air valve "C". The valve handle should be parallel to the pipe.
8	Close main air valve and media valve "D". To close the media valve, rotate the handle full, clockwise, then open media valve 2-3 full turns counter clockwise.
9	Install an air hose coupling (not supplied) to main air valve or moisture separator. Do not use a coupling or fitting that restricts air flow.
10	Connect an air line from the compressor to the air hose coupling you installed in the previous step. Keep hose length as short as possible. Use an air line at least three times the I.D. of the nozzle orifice. A 1-1/4" I.D. or larger air hose is generally used.

<table>
<tr><td>11</td><td>Fill the pressure vessel with dry media through the opening at the top of the vessel. When full, the media level should not exceed the <u>bottom</u> of sealing plunger.

CAUTION

Over-filling may prevent the sealing plunger from closing properly and cause needless wear.

WARNING

1. The operator must be equiped with recommended protective clothing. NIOSH/OSHA require the use of a respirator (air-fed hood), remote controls, canvas jacket, pants, and leather gloves.
2. OSHA requires that the respirator be supplied with Grade “D” compressed air and equipped with a personal air filter and C.O. monitor or ambient air pump.</td></tr>
<tr><td>12</td><td>Before blasting:
a) Check the personal air filter and CO monitor or ambient air pump for proper operation.
b) Use safety pins when joining blast hose to blast hose or blast hose to tank.
c) Make sure there is adequate air supply for both the operator’s respirator and the blast system.</td></tr>
</table>

2.4 Operation

NOTE
For proper operation of your UltraBlast system, maintain it regularly according to the maintenance schedules.

Use the following procedure to operate the UltraBlast 300 / 600 machine with PRRC remote controls:

Step	Procedure
1	Close main air valve. (In the closed position, the handle is perpendicular to the pipe.) Pressurize the air line that connects the compressor to the pressure vessel.
2	After the operator is dressed in protective clothing and the respirator is installed, the operator opens the main air valve. The vessel will not pressurize. The vessel will pressurize and blasting will start when the operator depresses the remote control handle. Generally, the best air/media mixture results when the blast stream exiting the nozzle is **just visible**. **NOTES** **1. For best results, hold the nozzle 18" from the work place and at a 90 degree angle to its surface.** **2. Overlapping strokes are recommended.** **3. The optimum "dwell time" depends on the final finish required. For example, move the nozzle faster for a "brush-off" finish than for a "white metal" finish.**
3	To stop blasting, the operator releases the remote control handle. The vessel will depressurize **WARNING** **Compressed air and some media from the pressure vessel will exit through the exhaust valve.** **CAUTION** **Never turn-off the compressor before depressurizing the pressure vessel.** **WARNING** **Always release trapped compressed air from vessel and pipe string before disconnecting any hoses.**

Step	Procedure
4	To avoid overnight condensation, **empty the vessel of media at the end of each day.** The most efficient way to empty the vessel is through normal blasting. However, if you want to empty the vessel quickly, proceed as follows: a) Remove the nozzle and washer from the nozzle coupling. b) Close the choke valve. c) Completely open the media valve. d) (Operator) Position yourself to begin blasting. e) (Operator) Depress the remote control. The vessel will "pump" the media out very quickly. f) (Operator) When the vessel has been emptied, release the remote control and close the main air valve.
5	Release trapped air between the main air valve and the compressor before disconnecting the hoses(s).

2.5 Troubleshooting

Use the following procedure to troubleshoot the Ultrablast 300 / 600 machine with PRRC remote controls:

Problem	Probable Cause	Remedy
Vessel will not pressurize	• Compressed air supply not on	• Start the compressor and open the compressed air valves to the vessel.
	• Remote control	• Refer to table for Remote Control Handle.
	• Air Inlet Valve or Exhaust Valve Defective	• Repair/replace valve internal components.
Vessel continuously alternates between pressurizing and depressurizing	• Low volume of compressed air	• Verify that supply air valve(s) are fully open.
	• Supply hose to long or diameter too small for required air volume (causing excessive friction loss)	• Use minimum 1 ¼" I.D. air hose
	• Compressor too small or using too much air	• Replace worn nozzle. Use smaller nozzle or use larger compressor.

Problem	Probable Cause	Remedy
Vessel pressurizes but no air or media emerges from nozzle	• Choke and media valves closed	• Open choke valve and adjust media valve
	• Clogged nozzle	**WARNING** **Shut-off air supply and depressurize vessel.** Remove the nozzle from the coupling and clear the obstruction from the nozzle orifice.
	• Clogged blast hose	**WARNING** **Shut–off air supply and depressurize vessel.** Remove the nozzle from the nozzle coupling and disconnect the blast hose from the tank coupling under the vessel. Remove media and debris from the hose. Check the media valve for proper setting.
Air but no media flow from nozzle	• Vessel empty	• Fill the vessel with media.
	• Media valve closed or set incorrectly	• Open the media valve a adjust for desired media flow.
	• Air leak(s) at one or more of the following locations: - Sealing plunger/”O” ring - Exhaust valve - Media valve - Fittings at bottom of vessel	**WARNING** **Shut–off air supply and depressurize vessel.** Repair/replace leaking and worn parts. Tighten the fittings at the bottom of the vessel.
	• Media valve plugged	• Open the media valve completely. Close the choke valve, remove the nozzle and washer from the nozzle coupling, turn on air, and depress the deadman to start the blast. All air pressure will be through the media valve.

Problem	Probable Cause	Remedy
		 **WARNING**  **Shut – off air supply and depressurize vessel**.
	• Vessel outlet plugged	• Lay the vessel down on the handle and disassemble the media valve. Clear the obstruction. It may be necessary to empty the vessel to remove accumulated debris.
		 **WARNING**  **Shut – off air supply and depressurize vessel.**
	• Wet/damp media (due to moisture from compressed air supply)	• Remove the vessel inspection door. Remove media from the vessel, or follow media “Valve Plugged” remedy (above).
Very heavy media flow with occasional spurts of air.	• Choke valve close	• Open the choke valve completely.
	• Low blast pressure	• Check the air supply pressure and verify that all air supply valves are open completely.
	• Media valve adjustment	• Reduce media flow by turning the handle clock-wise.
Uneven media flow at nozzle	• Media flow too rich	• Adjust the media valve clockwise to reduce media flow.
Hole in mixing tee under media valve	• Choke valve partly closed when blasting	• The system must be operated with the choke valve fully open.
Premature blast hose failure	• Nozzle/hose size incorrect	• The blast hose I.D. should be at least 3 times larger than the nozzle orifice. Example ¼” nozzle—3/4” blast hose (minimum).
	• Media flow too rich	• Reduce media flow by turning the media valve Handle clockwise.

Problem	Probable Cause	Remedy
Poor production	• Part condition	• The part must be dry and free of oil and grease.
	• Media flow	• Adjust media flow. Media should be just visible as it exits the nozzle.
	• Nozzle type	• The Venturi nozzle concentrates media as it exits the nozzle.
	• Distance between nozzle and part	• Closer up – smaller, more intense blast pattern. Further back – large, less intense blast pattern.
	• Low blast pressure	• Try each of the following: 1. Change worn nozzle 2. Use a smaller nozzle 3. Use a larger compressor and/or air supply line.
	• Media size	• use coarser/larger media for thick material.

Remote Control Systems

3

3.1 Description

The remote control activation switch, commonly referred to as a 'deadman', is connected to the valves on the blast machine using twinline or electrical line cord. The deadman provides direct cut-off of abrasive to the blast hose in the event the blaster loses control of the hose. OSHA regulations require all abrasive blast machines be equipped with remote control systems.

Deadman

Twinline

TITAN ULTRABLAST MACHINES are complete with a standard REMOTE CONTROL SYSTEM. Two systems are available:

The “standard” Pressure-Release Remote Control (PRRC) which depressurizes the tank each time the operator stops blasting by releasing the deadman. The (PRRC) System consists of two pneumatic valves that control the stop/start function of a pressure blast cleaning machine from the abrasive discharge point.

Or the “optional” Pressure-Hold Remote Control (PHRC) which maintains full pressure in the tank at all times (even when not blasting), except when refilling the tank.

These valves are operated by air pressure from a Deadman Control Switch that must be held in the depressed position to continue blasting. These systems are in full compliance with existing Federal regulations (OSHA) for pressure blast cleaning equipment.

3.2 Pressure-Release Remote Control (PRRC)

PRESSURE-RELEASE REMOTE CONTROL (PRRC)

The PRRC Remote Control System releases tank pressure each time the control switch (deadman) is released and comes standard on TITAN Ultrablast machines. The system consists of a spring closed IV-125 Air Inlet Valve, which controls the incoming air source, a 5720 Exhaust Valve, which holds or relieves pressure in the tank and a 5800 Abrasive Regulator, which controls the flow of media in the air stream. The IV-125 and 5720 valves are controlled by air pressure from the 6100 Deadman Control Switch, which must be held in the closed (depressed) position for blasting to continue.

When the operator depresses the Deadman Switch, simultaneously, the Air Inlet Valve is opened, allowing air pressure to be introduced to the tank and the Exhaust Valve is closed allowing the tank to pressurize. When the operator releases the Deadman Switch, simultaneously, the Air Inlet Valve closes, stopping air flow into the tank and the Exhaust Valve opens, depressurizing the tank. This shuts off the blast machine, releases the sealing plunger (SP-1) and allows the operator to fill the unit if needed.

Blasting will start or stop within 1/2 - 3 seconds of switch activation depending upon tank volume and distance from the machine to the deadman. This system should be considered when stopping will occur infrequently or when machine filling is done using a hopper, such as with a blast room or large hopper.

Inlet Valve IV-125

Exhaust Valve 5720

Abrasive Regulator 5800

3.2 Pressure-Release Remote Control (PRRC)

INITIAL OPERATION

(refer to Figure 3-2 PRRC System Diagram)

1. **FILL MACHINE WITH ABRASIVE** - Do not overfill, this will cause accelerated wear on the sealing plunger and gasket.

2. **SET CHOKE VALVE ("C")** - Initial setting of this valve is full open (handle in line with the piping). See the FINE TUNING section for adjustment details.

3. **SET ABRASIVE REGULATOR ("D")** - Initial setting should be 2-3 turns counterclockwise from fully closed. See the FINE TUNING section for later settings.

4. **CLOSE MANUAL AIR INLET VALVE ("B")** – As a precaution. Machines with remote control systems will not start until the control switch (deadman) is depressed.

5. **TURN ON AIR FROM COMPRESSOR** - This will pressurize all lines up to the blast machine including the remote control twinline and deadman switch.

6. **HOLD BLAST HOSE AT NOZZLE END** - Direct nozzle end away from personnel and equipment.

7. **OPEN MANUAL AIR INLET VALVE / BALL VALVE ("B")** - The machine is now ready to operate.

TO START BLASTING

DEPRESS THE DEADMAN CONTROL SWITCH – Remember to press the Red Safety Flap first. The unit will start as soon as it is pressurized. DO NOT EXCEED 125 PSI.

TO STOP BLASTING

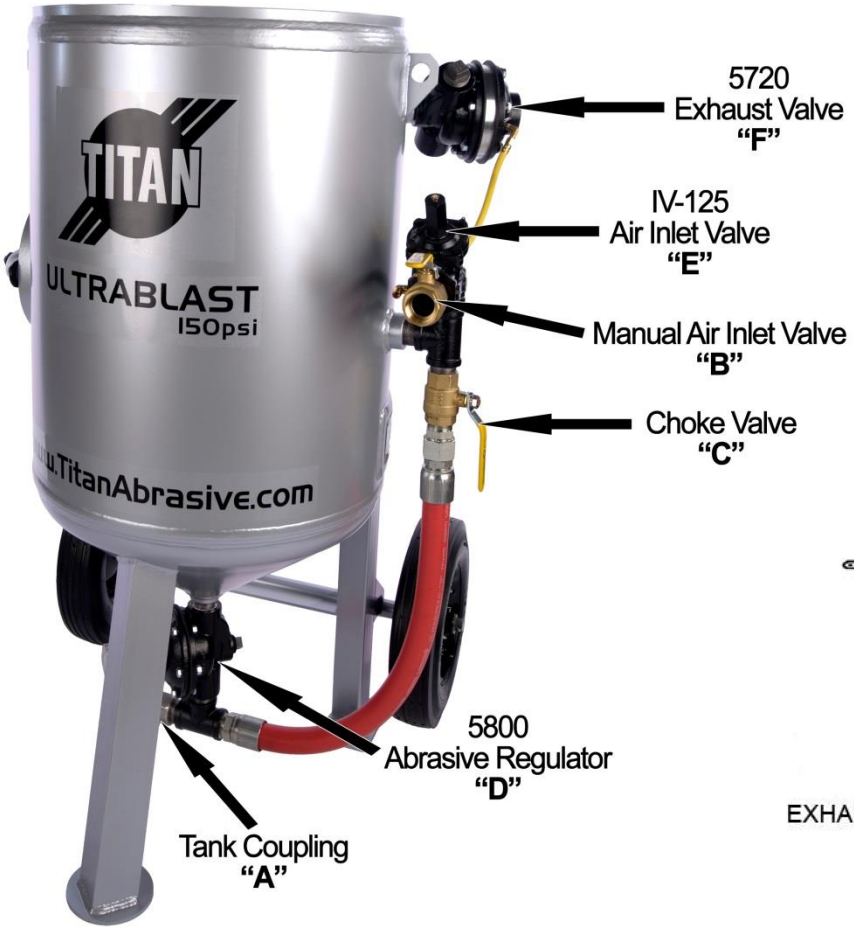
RELEASE THE DEADMAN CONTROL SWITCH – This will shut the unit off. The unit may be refilled any time it is shut down. We recommend that the Manual Air Inlet Valve / Ball Valve be closed whenever you refill or leave the unit unattended.

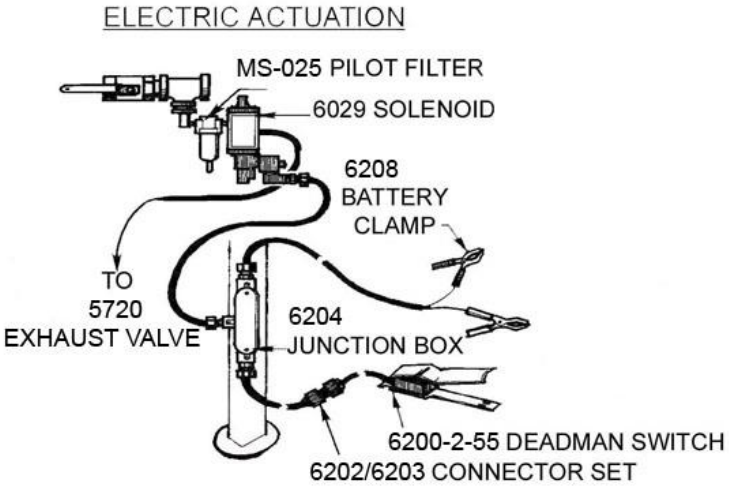
TO RE-START BLASTING

DEPRESS THE DEADMAN CONTROL SWITCH – Remember to press the Red Safety Flap first. The unit will start as soon as it is pressurized. DO NOT EXCEED 125 PSI.

3.2 Pressure-Release Remote Control (PRRC)

Pneumatic Actuation – Spring tension holds Air Inlet Valve closed until deadman switch is depressed. Tank exhausts when deadman is released.





Deadman (6100)

55' Twinline (6053)

Figure 3-2 PRRC System Diagram

3.2 Pressure-Release Remote Control (PRRC)

FINE TUNING

(refer to Figure 3-2 PRRC System Diagram)

1. **IV-125 AIR INLET VALVE "E"** – No adjustment is required.

2. **5800 ABRASIVE REGULATOR "D"** – Turn control handle clockwise to decrease the abrasive media flow, counterclockwise to increase. When properly adjusted abrasive media should be just visible in the air flow from the nozzle. The chart in the back of this manual indicates the correct abrasive media consumption for maximum performance with each nozzle size and will serve as a comparison for your settings. Once the flow is correct it is usually not necessary to readjust this valve.

3. **CHOKE VALVE "C"**– Normally this valve will be in the fully open position. Should the abrasive flow become erratic or stop completely, and the tank has abrasive in it, this valve may be slowly closed up to 30 degrees from the normal vertical position. This changes the air/abrasive ratio and usually restores the normal abrasive flow. During damp, humid weather it may be necessary to operate with the Choke Valve in a partially closed setting at all times. If partial closing does not restore the abrasive flow, close the valve completely for a few seconds, this will divert full air volume to the tank and force the obstruction through the abrasive regulator.

If the choke valve operation will not restore the abrasive media flow the unit is clogged (assuming it is not out of abrasive media). Clogging is usually from an obstruction lodged in the bottom outlet of the tank or in the 5700-17 Abrasive Regulator. See the maintenance section for information on servicing these components.

3.3 Pressure-Hold Remote Control (PHRC)

PRESSURE-HOLD REMOTE CONTROL (PHRC)

The PHRC Remote Control System maintains tank pressure even after the control switch (deadman) is released and is an option on all TITAN Ultrablast machines. The system consists of a 5720-17 Air Inlet Valve and a 5700-17 Abrasive Regulator. Both valves are normally closed by spring tension and are opened by an air pressure signal coming from a 6100 Deadman Control Switch held by the operator. The operator must hold the control switch (deadman) continuously engaged to operate the blast cleaning machine.

Releasing the control switch (deadman) releases pneumatic pressure to the diaphragm chamber in the Abrasive Regulator and spring tension forces the plunger to cut off the flow of media. Simultaneously, pneumatic pressure to the diaphragm chamber in the Air Inlet Valve is released and spring tension forces the plunger to cut off the compressed air supply, holding the tank under full working pressure and ready for immedate re-start. Because of the pressure retention, start-up is much faster and air usage is conserved. Restart requires only activation of the deadman control switch which causes the abrasive regulator valve to open simultaneously with the air inlet valve. The tank must be manually discharged through a manual exhaust valve for refilling or when leaving the machine unattended. This system is recommended for situations where frequent starts/stops will occur.

Abrasive Regulator 5700-17

Air Inlet Valve 5720-17

SPECIAL NOTE: *THE OPERATING RANGE FOR THE PHRC IS 60 - 120 P.S.I. YOU MUST STAY WITHIN THIS RANGE FOR SAFE OPERATION. OTHER RANGES ARE AVAILABLE, PLEASE CONTACT THE FACTORY FOR INFORMATION.*

Either of the above remote control systems is available as pneumatic or electric.

3.3 Pressure-Hold Remote Control (PHRC)

INITIAL OPERATION

(refer to Figure 3-3 PHRC System Diagram)

1. **FILL MACHINE WITH ABRASIVE** - Do not overfill, this will cause accelerated wear on the sealing plunger and gasket.

2. **SET CHOKE VALVE ("C")** - Initial setting of this valve is full open (handle in line with the piping). See the FINE TUNING section for adjustment details.

3. **SET ABRASIVE REGULATOR ("D")** - Initial setting should be 2-3 turns counterclockwise from fully closed. See the FINE TUNING section for later settings.

4. **CLOSE MANUAL AIR INLET VALVE / BALL VALVE ("B")** – A precaution. Machines with remote control systems will not start until the control switch (deadman) is depressed.

5. **TURN ON AIR FROM COMPRESSOR** - This will pressurize all lines up to the blast machine including the remote control twinline and deadman switch.

6. **HOLD BLAST HOSE AT NOZZLE END** - Direct nozzle end away from personnel and equipment.

7. **OPEN MANUAL AIR INLET VALVE / BALL VALVE ("B")** - The machine is now ready to operate. CAUTION: THE NEXT STEP WILL PRESSURIZE THE UNIT AND HIGH PRESSURE AIR WILL BE DISCHARGED FROM THE BLAST NOZZLE.

TO START BLASTING

DEPRESS THE DEADMAN CONTROL SWITCH – Remember to press the Red Safety Flap first. The unit will start as soon as it is pressurized. DO NOT EXCEED 125 PSI.

TO STOP BLASTING

RELEASE DEADMAN CONTROL SWITCH – Blasting will stop. The blast tank remains pressurized until refilling is necessary or the machine will be left unattended.

3.3 Pressure-Hold Remote Control (PHRC)

TO RESTART – WHEN TANK IS PRESSURIZED

DEPRESS DEADMAN CONTROL SWITCH – Blasting will start much faster with the tank already pressurized.

TO STOP – WHEN REFILLING IS NECESSARY

1. **RELEASE DEADMAN CONTROL SWITCH** – Blasting will stop.

2. **CLOSE MANUAL AIR INLET VALVE / BALL VALVE ("B")** – A precaution should someone accidentally depress the deadman switch while the tank is being filled.

3. **SLOWLY – OPEN MANUAL EXHAUST VALVE "F" - TO DEPRESSURIZE THE TANK -** CAUTION: HIGH PRESSURE AIR, WHICH MAY CONTAIN PARTICLES OF ABRASIVE MEDIA, WILL EXIT THE TANK THROUGH THIS VALVE.

TO RESTART – AFTER REFILLING

PROCEDURE IS THE SAME AS THE INITIAL START

LEAVING THE UNIT UNATTENDED

PROCEDURE IS THE SAME AS FOR REFILLING

3.3 Pressure-Hold Remote Control (PHRC)

Pneumatic Actuation – Spring tension holds Abrasive Regulator and Inlet Valve closed until deadman is depressed. Tank remains pressurized when deadman is released.

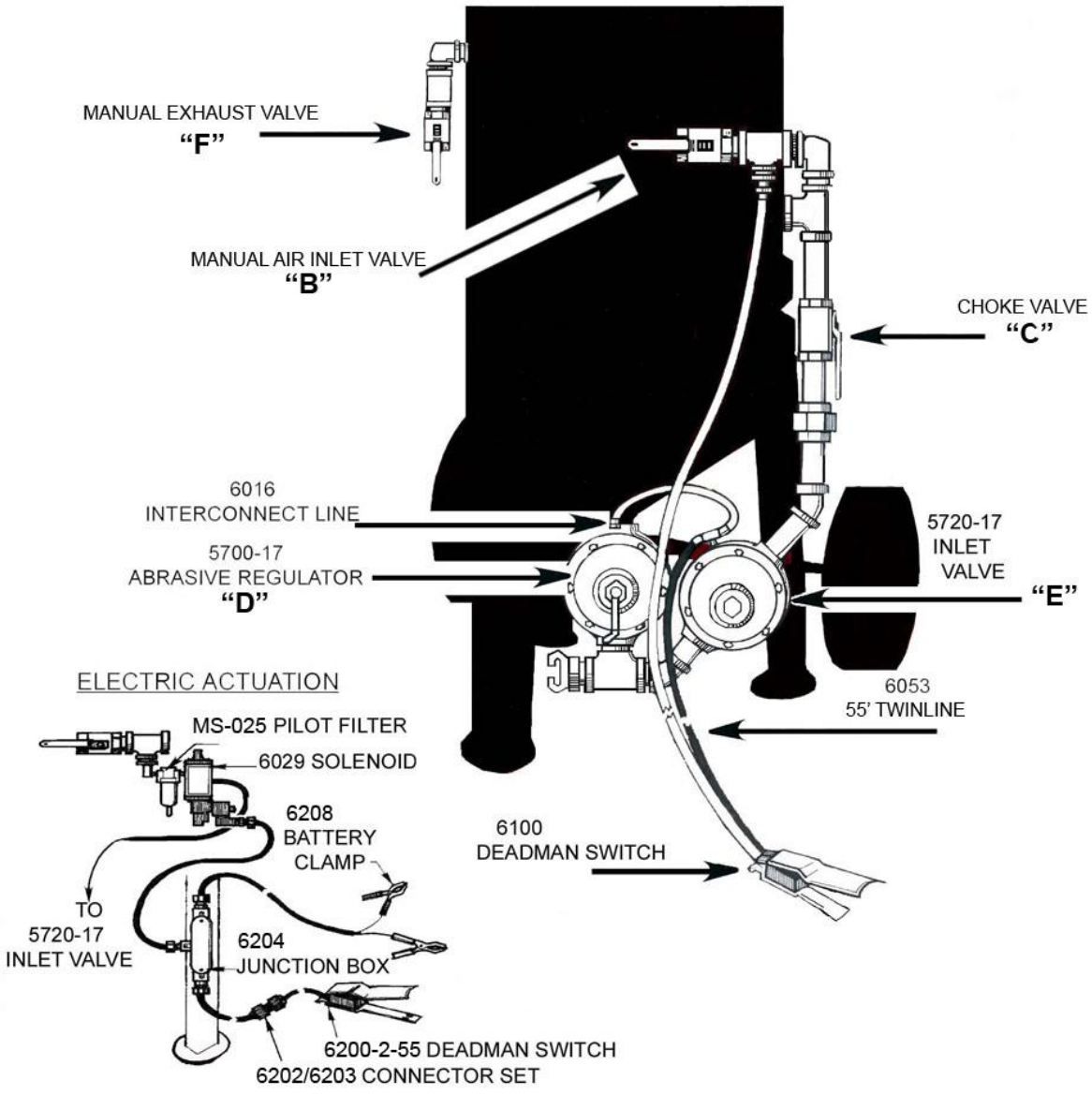


Figure 3-3 PHRC System Diagram

3.3 Pressure-Hold Remote Control (PHRC)

FINE TUNING

(refer to Figure 3-3 PHRC System Diagram)

1. **5720-17 AIR INLET VALVE "E"** – No adjustment is possible except for the preload on the spring.

2. **5700-17 ABRASIVE REGULATOR "D"** – Turn control handle clockwise to decrease the abrasive media flow, counterclockwise to increase. When properly adjusted abrasive media should be just visible in the air flow from the nozzle. The chart in the back of this manual indicates the correct abrasive media consumption for maximum performance with each nozzle size and will serve as a comparison for your settings. Once the flow is correct it is usually not necessary to readjust this valve.

3. **CHOKE VALVE "C"**– Normally this valve will be in the fully open position. Should the abrasive flow become erratic or stop completely, and the tank has abrasive in it, this valve may be slowly closed up to 30 degrees from the normal vertical position. This changes the air/abrasive ratio and usually restores the normal abrasive flow. During damp, humid weather it may be necessary to operate with the Choke Valve in a partially closed setting at all times. If partial closing does not restore the abrasive flow, close the valve completely for a few seconds, this will divert full air volume to the tank and force the obstruction through the abrasive regulator.

If the choke valve operation will not restore the abrasive media flow the unit is clogged (assuming it is not out of abrasive media). Clogging is usually from an obstruction lodged in the bottom outlet of the tank or in the 5700-17 Abrasive Regulator. See the maintenance section for information on servicing these components.

3.4 Troubleshooting

SYSTEM MALFUNCTION PRRC

1. **DEADMAN SWITCH DEPRESSED, 5720 EXHAUST VALVE OPENS AND BLASTING STOPS** – Indicates loss of pilot line air pressure. Check the condition of the 6100 Deadman Switch Handle or the 6053 Twin Line Control Hose for kinking or significant leaks.

2. **DEADMAN SWITCH DEPRESSED BLASTING STOPS, EXHAUST VALVE REMAINS CLOSED**– Indicates ruptured Diaphragm in the IV–125 Air Inlet Valve. Close Manual Air Inlet Valve, exhaust air from tank and disassemble the IV-125 Air Inlet Valve in accordance with instructions.

3. **MACHINE LEAKS AIR AT 5720 EXHAUST VALVE** – 5711 Valve Ball and Stem may be worn. Close Manual Air Inlet Valve, exhaust air from tank, remove Valve Cover and inspect. Could also indicate a ruptured 5712 Diaphragm and these should also be examined carefully.

4. **MACHINE WILL NOT START**. Same as No. 1 & 2 above. Check to see if Exhaust Valve is closing when Deadman is depressed, if it is, use the repair procedure in No. 2.

5. **AIR LEAKS PAST THE IV-125 WHEN THE SYSTEM IS SHUT DOWN.** Indicates a weakening of the spring. Rebuild Inlet Valve using repair kit (Part No. IV-125R).

3.4 Troubleshooting

SYSTEM MALFUNCTION PHRC

1. **BLASTING STOPS, DEADMAN SWITCH IS DEPRESSED** – Indicates loss of pilot line air pressure. Check the condition of the 6100 Deadman Control Switch.

2. **ABRASIVE FLOW STOPS BUT AIR CONTINUES TO FLOW FROM THE NOZZLE AT FULL PRESSURE, DEADMAN SWITCH IS DEPRESSED** – Indicates possible ruptured outer Diaphragm in the 5700-17 Abrasive Regulator. Could also be an obstruction in the tank or in the Abrasive Regulator.

3. **EXCESSIVE ABRASIVE FLOW WITH LITTLE CLEANING EFFECT, DEADMAN SWITCH IS DEPRESSED** – A ruptured outer Diaphragm in the 5720-17 Air Inlet Valve would close the Valve and have the same choking effect on the blast machine as closing the manual choke valve.

4. **MACHINE WILL NOT START, DEADMAN IS DEPRESSED** – See No. 1 above.

5. **MACHINE STARTS BUT NO ABRASIVE WILL FLOW** – See No. 2 above.

6. **MACHINE STARTS BUT FLOWS ABRASIVE ONLY** – See No. 3 above.

7. **AIR OR ABRASIVE FLOW WILL NOT SHUT OFF** – Defective spring in either valve, air pressure in excess of 120 P.S.I. or abrasive flow is the problem and obstruction in the abrasive regulator. Also check spring preload adjustment if the valve has recently been disassembled.

NOTES:

4

UltraBlast Machine Maintenance

WARNING: THE TANK MUST BE DEPRESSURIZED AND THE AIR SUPPLY LINE DISCONNECTED AT THE MAIN AIR INLET BEFORE ANY MAINTENANCE SERVICE IS PERFORMED ON THE REST OF THE EQUIPMENT

4.1 HOURLY OR AS NEEDED

MOISTURE SEPARATORS (If Applicable) – Check automatic drain separators on the main air supply lines.

4.1.1 DAILY

Check condition of all air pilot lines and fittings. Check operation of safety button on 6100 Deadman Switch.

BLAST HOSE – Inspect daily for wear. To avoid blowouts replace the hose when the I.D. approaches the outer edge of the central tube. If blowouts do occur replace the hose immediately.

BLAST NOZZLE – Carbide Nozzles should be removed from the Holder every few days and checked for wear at the entrance. If the wear is uneven check the hose end for a square cut and the gasket for wear. Coat the threads with anti-seize compound before reinstalling.

BLAST TANK INTERNAL COMPONENTS -SEALING O-RING PART NO. SG-1 – Should be replaced when complete sealing no longer occurs. The Sealing O-Ring is easily removed and replaced by hand using a rolling motion, however, if tools are used be careful not to damage the steel retaining ring. Do not use adhesive on the o-ring or the retaining ring.

BLAST TANK INTERNAL COMPONENTS –INSPECTION DOOR – Inspect the Gasket on the Inspection Door and replace if damaged. Install door in the original position, aligning the gasket evenly around the sealing area. Tighten nut to one full turn past hand tight. Pressurize unit and inspect for leaks.

4.1.2 WEEKLY

COUPLINGS – Hose End and Tank Couplings should be checked for gasket wear at least weekly.

BLAST TANK INTERNAL COMPONENTS - SEALING PLUNGER PART NO. SP-1 – Under normal operating conditions the Sealing Plunger does not require service and will last a long time. However, erosion grooves may develop on the plunger face if the unit is overfilled frequently. These grooves will destroy the sealing o-ring very quickly if the plunger is not replaced.

The **Plunger** is serviced through the inspection door opening on the side of the tank. Remove the door by loosening the nut on the yoke, turn the yoke, then allow the door to drop into the tank as one unit, do not remove nut. The door can be removed but some require very exact positioning for removal.

Reach into the inspection door opening and locate the plunger support pipe. Unscrew the support pipe and remove plunger and pipe as one unit. Inspect the support pipe for wear and replace if necessary. Before installing the new SP-1 Plunger and support pipe and tighten **BY HAND, DO NOT USE A WRENCH**. Always install a new Sealing O-Ring with a new Plunger.

4.1.3 MONTHLY

Remove cover from all Titan Valves. Check condition of the following part Numbers: 5711 Valve Ball & Stem, 5712 Diaphragms and 5715 Seat. Valve should be thoroughly cleaned before reassembly.

4.1.4 SEMI-ANNUALLY

PRRC ONLY – Inspect IV-125 Air Inlet Valve, 5720 Exhaust Valve, and 5800 Abrasive Regulator.

PHRC ONLY - Inspect the 5720-17 Air Inlet Valve and the 5700-17 Abrasive Regulator following the procedure for disassembly listed on the following page. We recommend replacement of the 5712 Diaphragm and the 5780 Valve Spring Assembly at this inspection period.

4.2 TITAN VALVE REPAIR PROCEDURES

5700–17 AND 5720-17 DISASSEMBLY INSTRUCTIONS

1. (ABRASIVE REGULATOR ONLY) – If the machine contains abrasive the tank should be placed on its side to prevent the abrasive from flowing out during service. If the machine must remain in a vertical position, remove the Cleanout Plug (18) and insert a short length of ¾" O.D. pipe or tubing through the Valve Body into the Ball Seat (15) to block abrasive flow.

2. Remove the air pilot line from the Valve Cover.

3. Release tension from spring by removing Tensioner (4 or 25)

4. Remove the 6 nuts from 3/8" Hex Head Bolts (9) that hold the valve in place.

5. Using a small hammer LIGHTLY tap around the Outer Spacer Ring (14). This will free up the entire outer assembly for removal. DO NOT use a screwdriver or similar tool to pry off spacer ring and cover. The Valve Cover (6), Ball and Stem (20). Ball Stem Nut (19), Diaphragms (11) and the Spacer Ring (14) should be removed as one unit. Remove the Hex Head Bolts and separate the Valve Cover from the remaining parts.

6. Inspect Diaphragms (11) for tearing and replace if necessary. * To replace Spring Diaphragm the following instructions must be followed to insure proper operation and safety precautions.

7. A drill press or manual press must be used to compress the Valve Spring. To compress the spring install assembly with diaphragm toward drill chuck. Open drill chuck to allow spring bolt to enter inside during assembly. Insert socket head wrench through hole in base of press, spring retainer, and into spring bolt. Compress spring using handle of press. Remove threaded washer (13) and relieve pressure slowly from handle.

8. The Ball and Stem (20) should be replaced if any sign of wear is present.

9. The Ball Seat (15) should be replaced when any wear is visible or the Ball and Stem will wear prematurely. A 1–3/4" socket is required to remove the Seat. When installing a new seat coat the threads with pipe joint compound and tighten to 30 ft. lbs. of torque, <u>DO NOT OVER TIGHTEN.</u>

(For Diagram Reference See Section #6)

5700–17 AND 5720-17 DISASSEMBLY INSTRUCTIONS

10. Holding the Valve Cover (8), check the operation of the Control Handle (1). It should turn freely without binding. Inspect the Control Stem for worn or damaged threads, replace if necessary.

RE-ASSEMBLY

1. Spring Assembly – Check condition of threads on Spring Bolt (9), replace if necessary. Spring Washer (10) should be flat and the center hole should be round. Replace if wear is evident. To reassemble spring install assembly in press as described in removal instructions. Compress spring with handle of press and attach Spring Bolt to threaded washer. The entire assembly should be tightened until the diaphragm does not move on the assembly.

2. Valve Assembly – Prior to installation of components remove the Spacer Piston (15) and inspect for wear. Replace O-Ring and/ or Piston if wear is evident. Apply small amount of grease on O-Ring prior to installation. Locate bleed holes on Valve Cover (6) and Center Spacer (14). Both bleed holes should face the ground when installed on machine.

3. Insert the 6-3/8" Hex Head Bolts (9) through the Valve Cover and install the spacer/diaphragm assembly on the main body. Install the nuts on the Hex Head Bolts and torque to 35 ft. lbs. In two stages using a cross pattern, remove the tool from the cleanout port, install cleanout plug and torque to 60 ft. lbs.

4. Apply tension to spring by turning tensioner in until it is tight against valve cover. **DO NOT OPERATE WITH TENSIONERS PARTIALLY APPLIED.**

5. Install air pilot line on the Valve cover.

THE FOLLOWING COMPONENTS DO NOT HAVE A MAINTENANCE SCHEDULE SERVICE AS REQUIRED

REMOTE CONTROL SYSTEM – PILOT VALVE PART NO. 6029 (ELECTRIC MODELS ONLY) – Perform an internal inspection of this valve under the following circumstances: (a) The operation of the remote control system changes in any way, particularly with respect to starting and stopping time, or (b) during service on the NO. 5700 Abrasive Regulator ruptured inner and outer diaphragms that allow abrasive grit to enter the pilot system. The Pilot Valve can be serviced without removing the Valve Body (6) from the blast machine.

1. Remove the Operator (1) leaving the air hose attached. The Operator Plunger (2) and Retainer should remain in the operator. Remove the Spool (4) and the Spring (5) from the Valve Body (6). Check the O-Ring on the Spool, if damaged, the Spool Chamber may be scored and the entire valve will have to be replaced. If the Spool Chamber is not scored, a repair kit, Part No. 6042, is available and contains a new Spool with O-Ring installed. The O-Rings are not serviced separately.

5720 DISASSEMBLY INSTRUCTIONS

1. Remove the air pilot from the Valve Cover.
2. Remove the 6 nuts from 3/8” Hex Head Bolts that hold the valve cover in place.
3. Using the small hammer LIGHTLY tap around the Outer Spacer Ring. This will free up the entire outer assembly for removal. **DO NOT** use a screwdriver or similar tool to pry off spacer ring and cover. The Valve Cover, Ball and Stem, Ball Stem Nut, Diaphragms, and the Outer and Inner Spacer Ring should be removed as one unit. Remove the Hex Head Bolts and separate the Valve Cover from the remaining parts.
4. Inspect Diaphragm for tearing and replace if necessary. It is a good idea to replace the inner diaphragm each time this service is performed.
5. The Ball and Stem should be replaced if any sign of wear is present.
6. The Ball Seat should be replaced when any wear is visible or the Ball and Stem will wear prematurely. A 1-3/4” socket is required to remove the Seat. When installing a new seat coat the threads with pipe joint compound and tighten to 30 ft.,lbs. of torque, **DO NOT OVER TIGHTEN.**

REASSEMBLY

1. Assemble the Inner Spacer ring, Outer Spacer Ring, Diaphragms, Ball and Stem and the Ball Stem Nut into a single unit. Tighten the Ball Stem Nut hand tight after replacing. Make certain that the spacer rings are installed with the taper in the correct direction, this is crucial to the operation of the valve. Locate the 1/8” hole in the Outer Spacer Ring. When the assembly is installed in the Valve Body this hole must be located facing the ground when the blast machine is in operation.
2. Insert the 6-3/8” Hex Head Bolts through the Valve Cover and install the spacer/diaphragm assembly on the main body. Install the nuts on the Hex Head Bolts and torque to 35 ft. lbs. in Two stages using a cross pattern.
3. Install air pilot line on the Valve Cover.

5800 DISASSEMBLY INSTRUCTIONS

1. Remove the air pilot from the Valve Cover.
2. Remove the 6 nuts from 3/8” Hex Head Bolts that hold the valve cover in place.
3. Using the small hammer LIGHTLY tap around the Outer Spacer Ring. This will free up the entire outer assembly for removal. **DO NOT** use a screwdriver or similar tool to pry off spacer ring and cover. The Valve Cover, Ball and Stem, Ball Stem Nut, Diaphragms, and the Outer and Inner Spacer Ring should be removed as one unit. Remove the Hex Head Bolts and separate the Valve Cover from the remaining parts.
4. Inspect Diaphragm for tearing and replace if necessary. It is a good idea to replace the inner diaphragm each time this service is performed.
5. The Ball and Stem should be replaced if any sign of wear is present.
6. The Ball Seat should be replaced when any wear is visible or the Ball and Stem will wear prematurely. A 1-3/4” socket is required to remove the Seat. When installing a new seat coat the threads with pipe joint compound and tighten to 30 ft.,lbs. of torque, **DO NOT OVER TIGHTEN.**

CARBON MONOXIDE CONTAMINATION

BREATHING AIR HAVING CARBON MONOXIDE LEVELS EXCEEDING 20 PPM IS IN VIOLATION OF FEDERAL SAFETY STANDARDS FOR SUPPLIED AIR RESPIRATORY EQUIPMENT. IF THE AIR QUALITY IS NOT KNOWN, A CARBON MONOXIDE MONITOR OR FREE AIR PUMP BREATHING SYSTEM SHOULD BE CONSIDERED. APART FROM MAKING THE PROPER RESPIRATORY EQUIPMENT AVAILABLE WE ASSUME NO RESPONSIBILITY FOR SUPPLYING BREATHABLE AIR TO THE END USER.

RECOMMENDED SPARE PARTS FOR TITAN ULTRABLAST MACHINES

5

Pressure-Release Remote Control System (PRRC)

Quantity	***Part Number***	***Description***
2	1614	Inspection Door Gasket
2	SG-1	Sealing Gasket
1	6016-1	1’ Interconnect Hose
1	6053	55’ Twinline
4	5711	Ball & Stem (1-3/8”)
8	5712	Diaphragm
2	5715	Ball Seat
1	6199	Deadman Repair Kit
1	IV-125R	Inlet Valve Repair Kit

Pressure-Hold Remote Control System (PHRC)

Quantity	***Part Number***	***Description***
2	1614	Inspection Door Gasket
2	SG-1	Sealing Gasket
1	6016-1	1’ Interconnect Hose
1	6053	55’ Twinline
4	5791	Ball & Stem (3/8”)
4	5712	Diaphragm
2	5715	Ball Seat
2	5788	Guide O-Ring
2	5789	Piston O-Ring
1	6199	Deadman Repair Kit

TITAN Abrasive

NOTES:

Individual Components Parts

6

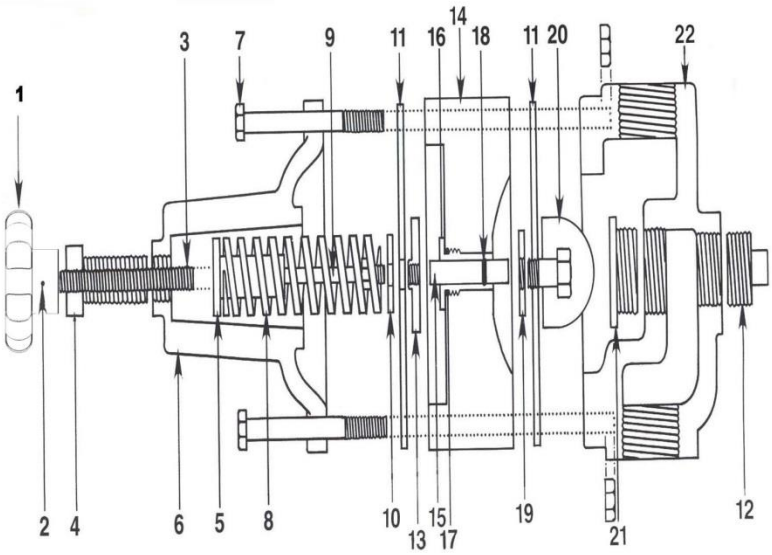
Title **Page**

TITAN Abrasive

NOTES:

INDIVIDUAL COMPONENTS PARTS

6.1 Abrasive Regulator Parts



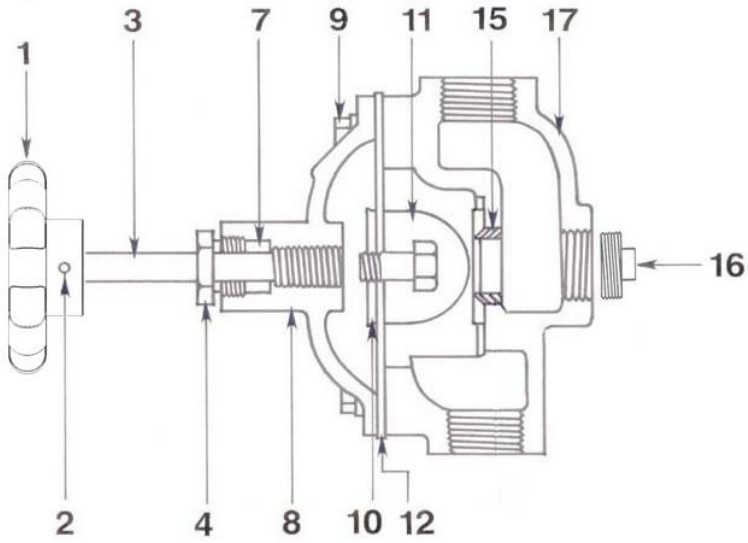
6.1.1 5700-17 ABRASIVE REGULATOR – PILOT AIR TO OPEN

Item	Part Number	Description
0	5700-17	COMPLETE VALVE
1	5771	Control Handle
2	5772	Retaining Pin
3	5773	Control Stem
4	5774	Spring Tensioner
5	5777	Spring Retainer
6	5778	Valve Cover
7	5779	Hex Head Bolt
7	5706	Hex Nut
8	5780	Valve Spring
9	5781	Spring Bolt with Nut
10	5782	Spring Washer
11	5712	Diaphragm
12	5718	Clean Out Plug
13	5784	Threaded Washer
14	5785	Center Spacer
15	5786	Spacer Piston
16	5787	Piston Guide
17	5788	Guide O-Ring
18	5789	Piston O-Ring
19	5710	Ball and Stem Nut
20	5791	Ball and Stem
21	5715	Valve Seat
22	5717	Valve Body
23	5790	Spring Assembly includes (4,5,8,9,10,11,13)

WARNING

NEVER ATTEMPT TO DISASSEMBLE THE SPRING ASSEMBLY. THE SPRING IS UNDER HIGH COMPRESSION AND CAN CAUSE INJURY WHEN RELEASED.

INDIVIDUAL COMPONENTS **PARTS**

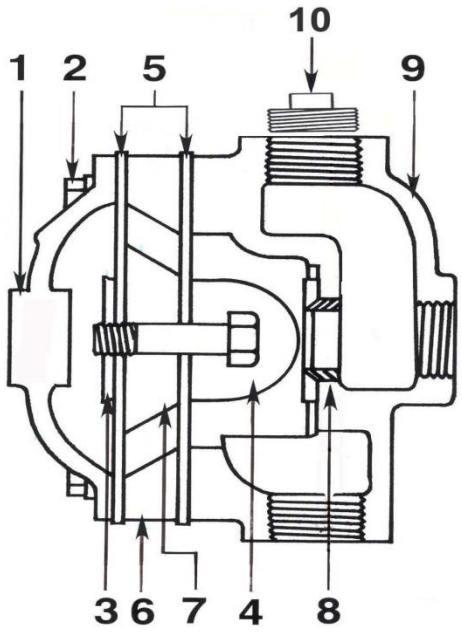


6.1.2 5800 ABRASIVE REGULATOR – MANUAL

Item	Part Number	Description
0	5800	COMPLETE VALVE
1	5701	Control Handle
2	5772	Retaining Pin
3	5703	Control Stem
4	5704	Packing Nut
5	5705	Packing
7	5707	Packing Retainer
8	5708	Valve cover
9	5809	Hex Head Bolt
9	5706	Hex Nut
10	5710	Ball and Stem Nut
11	5791	Ball and Stem
12	5712	Diaphragm
15	5715	Valve Seat
16	5718	Clean Out Plug
17	5717	Valve body

INDIVIDUAL COMPONENTS PARTS

6.2 EXHAUST VALVE PARTS



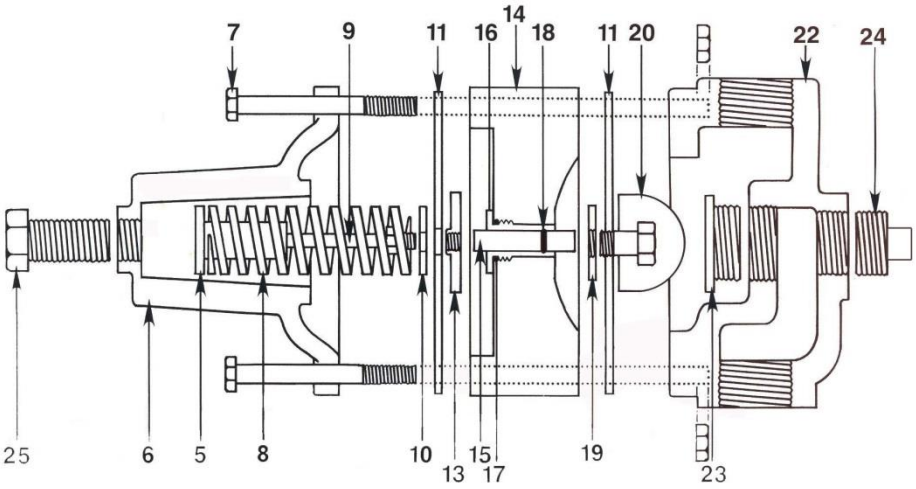
6.2.1 5720 AIR EXHAUST VALVE

Item	Part Number	Description
0	5720	COMPLETE VALVE
1	5721	Valve Cover
2	5709	Hex Head Bolt
2	5706	Hex Nut
3	5710	Ball and Stem Nut
4	5711	Ball and Stem
5	5712	Diaphragm
6	5713	Outer Spacer
7	5714	Inner Spacer
8	5715	Valve Seat
9	5717	Valve Body
10	5719	Square Head Plug

WARNING

Stay clear of exhaust valve when pot blows down. Exhausted particles can cause eye injury. NOTE: Blow Down is operator controlled and can occur without warning. Wear Protective Clothing.

6.3 AIR INLET VALVE PARTS

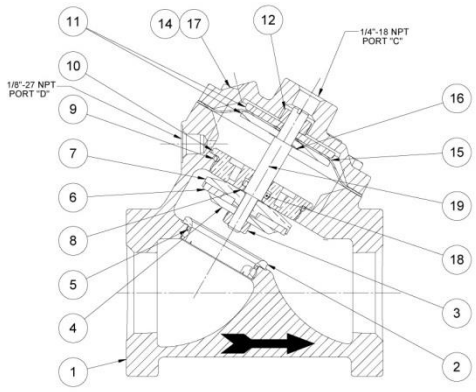


6.3.1 5720-17 AIR INLET VALVE

Item	Part Number	Description
0	5720-17	COMPLETE VALVE
5	5777	Spring Retainer
6	5778	Valve cover
7	5779	Hex Head Bolt
7	5706	Hex Nut
8	5780	Valve Spring
9	5781	Spring Bolt with Nut
10	5782	Spring Washer
11	5712	Diaphragm
13	5784	Threaded Washer
14	5785	Center Spacer
15	5786	Spacer Piston
16	5787	Piston Guide
17	5788	Guide O-Ring
18	5789	Piston O-Ring
19	5710	Ball and Stem Nut
20	5791	Ball and Stem
21	5715	Valve Seat
22	5717	Valve Body
24	5718	1” Clean Out Plug
25	5775	Spring Tensioner
23	5790-B	Spring Assembly includes (5,8,9,10,11,13,25)

INDIVIDUAL COMPONENTS	PARTS

Inlet Valve (IV – 125)

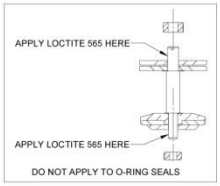


** Note: arrow should point opposite the flow of air*

REPAIR PARTS KIT
(part no. IV-125R)

Diaphragm & Seals
3, 5, 6, 8, 9, 12, 15, 16, 18

Internal Parts
4, 7, 10, 11(2), 19



6.3.2 IV – 125 AIR INLET VALVE

Part Number	Description
IV - 125	Complete Valve
IV – 125R	Repair Parts Kit

6.4 PRESSURE VESSEL (TANK)




Part Number	Description
SG – 1	Sealing Gasket
1612	Inspection Door Assembly 6” x 8”
1614	Inspection Door Gasket 6” x 8”
SP – 1	Sealing Plunger (large)
MS – 100	1” Moisture Seperator
MS – 125	1 – ¼” Moisture Seperator
MS – 125A	1 – ¼” Moisture Seperator W / Auto Drain
PR – 100	1” Pressure Regulator W / Gauge
PR – 125	1 – ¼” Pressure Regulator W / Gauge
MS – FE	Replacement Filter Element for Moisture Separator
MS – SK	Service Kit For Moisture Separator
PGA	Gauge Assembly
1600	Gauge
E Muffler	Muffler (Exhaust)

6.5 PNEUMATIC REMOTE CONTROL HANDLE



Part Number	Description
6100	Deadman Switch
6199	Deadman Repair Kit
6108	Safety Flap For Deadman

6.6 ELECTRIC REMOTE CONTROL HANDLE

Part Number	Description
6200	ELECTRIC DEADMAN

6.7 REMOTE CONTROL TWINLINE

Part Number	Description
6058	105' TWINLINE
6053	55' TWINLINE
6056	30' TWINLINE
6055	25' TWINLINE EXTENSION
6054	50' TWINLINE EXTENSION
6057	100’ TWINLINE EXTENSION

6.8 BAG BREAKER , SCREEN and LID

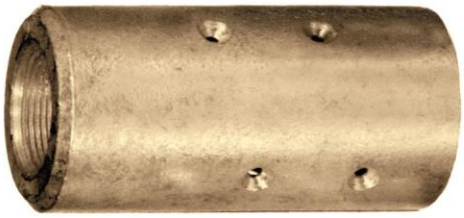
Part Number	Description
BBK	Bag Breaker Kit
SCREEN	Screen For Blast Machine
COVER – 16	16” Cover For 3 CU FT Blast Machine
COVER – 24	24” Cover For 6 CU FT Blast Machine
UMBRELLA	Umbrella Assembly

6.9 NOZZLES




Part Number	Description
	Angle Nozzles
ATCN-4	¼” Tungsten Carbide Angle Nozzle – Single Outlet
ATCN-5	5/16” Tungsten Carbide Angle Nozzle – Triple Outlet
	Boron Carbide Nozzles
BCNV-4	¼” boron Carbide Long Venturi Aluminum Jacket
BCNV-5	5/16” Boron Carbide Long Venturi Aluminum Jacket
BCNV-6	3/8” Boron Carbide Long Venturi Aluminum Jacket
BCNV-8	½” Boron Carbide Long Venturi aluminum Jacket
	Tungsten Carbide Nozzles (Long)
TCNV-3	3/16” Tungsten Carbide Long Venturi Nozzle
TCNV-4	¼” Tungsten Carbide Long Venturi Nozzle
TCNV-5	5/16” Tungsten Carbide Long Venturi Nozzle
TCNV-6	3/8” Tungsten Carbide Long Venturi Nozzle
TCNV-7	7/16” Tungsten Carbide Long Venturi Nozzle
TCNV-8	½” Tungsten Carbide Long Venturi Nozzle
	Tungsten Carbide Nozzles (Medium Length)
TCNVM-4	¼” Medium Length Tungsten Carbide Venturi Nozzle (3/4” Threads)
TCNVM-6	3/8” Medium Length Tungsten Carbide Venturi Nozzle (3/4” Threads)
	Tungsten Carbide Nozzles (Short)
TCNVS-3	3/16” Tungsten Carbide Medium Venturi Nozzle
TCNVS-4	¼” Tungsten Carbide Medium Venturi Nozzle
TCNVS-5	5/16” Tungsten Carbide Medium Venturi Nozzle
TCNVS-6	3/8” Tungsten Carbide Medium Venturi Nozzle
	Tungsten Carbide Nozzle (Double Venturi)
UDV-4	¼” Tungsten Carbide Double Venturi Nozzle
UDV-5	5/16” Tungsten Carbide Double Venturi Nozzle
UDV-6	3/8” Tungsten Carbide Double Venturi Nozzle
UDV-7	7/16” Tungsten Carbide Double Venturi Nozzle
UDV-8	1/2” Tungsten Carbide Double Venturi Nozzle

6.10 NOZZLE HOLDERS



Part Number	Description
NH-050	1/2" NOZZLE HOLDER
NH-075	3/4" NOZZLE HOLDER
NH-075B	3/4" NOZZLE HOLDER - BRASS
NH-100	1" NOZZLE HOLDER
NH-100B	1" NOZZLE HOLDER - BRASS
NH-125	1-1/4" NOZZLE HOLDER
NH-125B	1-1/4" NOZZLE HOLDER - BRASS
NH-150	1-1/2" NOZZLE HOLDER

6.11 AIR HOSE and COUPLINGS

Part Number	Description
AH-100	1" AIR HOSE - PER FOOT
AH-125	1-1/4" AIR HOSE - PER FOOT
AH-200	2" AIR HOSE - PER FOOT
AHCFE-075	3/4" AIR HOSE COUPLING - FEMALE END
AHCFE-100	1" AIR HOSE COUPLING - FEMALE END
AHCFE-125	1-1/4" AIR HOSE COUPLING - FEMALE END
AHCFE-200	2" AIR HOSE COUPLING - FEMALE END
AHCG-075	1/2" to 1" AIR HOSE COUPLING GASKET
AHCG-100	1-1/4" to 2" AIR HOSE COUPLING GASKET
AHCHE-100	1" AIR HOSE COUPLING - HOSE END
AHCHE-125	1-1/4" AIR HOSE COUPLING - HOSE END
AHCHE-150	1-1/2" AIR HOSE COUPLING - HOSE END

6.12 BLAST HOSE and COUPLINGS




Part Number	Description
BH-050-25	1/2" BLAST HOSE - 25' section
BH-050-50	1/2" BLAST HOSE - 50' section
BH-075-25	3/4" BLAST HOSE - 25' section
BH-075-50	3/4" BLAST HOSE - 50' section
BH-100	1" BLAST HOSE - 50' section
BH-125	1-1/4" BLAST HOSE - 50' section
BH-150	1-1/2" BLAST HOSE - 50' section
BHC-050	1/2" BLAST HOSE COUPLING
BHC-075	3/4" BLAST HOSE COUPLING
BHC-075B	3/4" BLAST HOSE COUPLING - BRASS
BHC-100	1" BLAST HOSE COUPLING
BHC-100B	1" BLAST HOSE COUPLING - BRASS
BHC-125	1-1/4" BLAST HOSE COUPLING
BHC-125B	1-1/4" BLAST HOSE COUPLING - BRASS
BHC-150	1-1/2" BLAST HOSE COUPLING
BHCG	BLAST HOSE COUPLING GASKET
BHW-125	1-1/4" BLAST HOSE WHIP - 50' Section
HN-100	1" HOSE NIPPLE
HN-125	1-1/4" HOSE NIPPLE
SCL	SAFETY CLIP

6.13 SAFETY EQUIPMENT



Part Number	Description
NV2000	Nova 2000
NV2017	Nova 2000 Tear Off Lens (pkg. 50)
NV2018	Nova 2000 Inner Lens (pkg. 10)
NV2031	Nova 2000 Outer Lens (pkg. 50)
NV2002	28” Nylon Cape – Nova 2000
NV2002XL	38” Nylon Cape – Nova 2000
NV3 – 702 – 50	Nova 3 Helmet
NV3 – 722	Nova 3 Inner Lens (pkg. 10)
NV3 – 724	Nova 3 Outer Lens (pkg. 50)
NV3 – 725	Nova 3 Tear Off Lens (pkg. 50)
4000 – 01	Cool Tube
4000 – 20	Hot Tube
BS – L	Blast Suit (large)
BS – M	Blast Suit (medium)
BS – XL	Blast Suit (extra-large)
LG – 1	Double Palm Leather Blasting Gloves
NV2029	50’ Breathing Air Supply Hose
RPB900	Radex Breathing Air Filter
41RF	Breathing Air Filter Cartridge
RPB – CO	Carbon Monoxide Monitor
NV2000PKG	Nova 2000 Helmet, 50’ Breathing Hose, Breathing Air Filter

Warranty 7

LIMITED WARRANTY

Titan Abrasive Systems, LLC ("Titan") warrants all parts and equipment against defect in material and workmanship to the original purchaser for a period of **three (3)** years after shipment. Upon prompt notification by the buyer, to Titan, components that are determined by Titan to be defective will be repaired or replaced at no additional charge.

LIMITATIONS:

1. This warranty does not apply to normal wear items such as nozzles, blast hose, and re-claimers or to other components that are exposed to direct contact with blast media.
2. The buyer must follow all recommended maintenance schedules; see Operating Instructions & Maintenance Manual.
3. Does not apply to misapplication of product.
4. Unauthorized service, repair, improper installation, improper operation, improper maintenance, alterations, misuse, neglect, accident or excessive ambient conditions will void the warranty.
5. **If genuine Titan replacement parts are not used the warranty is void.**
6. Returned Materials Authorization (RMA) form must be completed and accompany all returned materials. Returns will not be recognized without prior authorization and RMA number.
7. Associated installation costs are excluded.
8. Freight cost for materials returned to Titan are to be assumed by the buyer unless the parts are determined defective by Titan.
9. Parts not supplied by Titan are not covered. Commercial components are warranted under terms of the original manufacturer.

Customer Acceptance:

Signature: _____Date: _____

Print Name: _____ Company Name: _____

Blast Media Characteristics Comparison

Material	Mesh Size	Shape	Density lbs/ft3	Mohs	Friability	Initial Cost	No. of Cycles	Per use Cost	Source	Typical Applications
Silica Sand•	6-270	★	100	5.0-6.0	high	low	1	med.	nat.	Outdoor blast cleaning
Slag	8-80	★	85-112	7.0-7.5	high	med.	1-2	med.	b-p	Outdoor blast cleaning
Garnet	8-300	★	130-145	7.0	med.	med.	2-2.5	med.	nat.	Cleaning, finishing, deburring, etching
Steel Grit	10-325	★	230	8.0	low	high	200+	med.	mfd.	Removing heavy scale
Steel Shot	8-200	●	280	8.0		high	200+	low	mfd.	Cleaning, peening
Aluminum Oxide	12-325	★	125	9.0	med.	high	6-8	med.	mfd.	Cleaning, finishing, deburring, etching
Silicon Carbide	12-325	★	110	9.5	med.	high	5-6	med.	mfd.	Surface preparation on extremely hard substrates
Glass Bead	10-400	●	85-90	5.5-6.0	med.	med.	8-10	low	mfd.	Cleaning, finishing
Plastic	12-80	★	45-60	3.0-4.0	low/med.	high	8-10	med.	mfd.	Paint stripping, deflashing, cleaning
Sodium Bicarbonate	60-170	★	60	2.5	high	high	1	high	mfd.	Cleaning, paint removal
Wheat Starch	12-80	★	45	2.0	med.	med.	12-15	high	mfd.	Paint, adhesive removal; composites
XL Corn Hybrid Polymer	16-60	★	45	3.0	low	high	14-17	med.	mfd.	Composite paint removal, adhesive deflash
Corn Cob	8-40	★	35-45	2.0-4.5	med.	low	4-5	low	b-p	Removing paint from delicate surfaces

★=Angular ●= Spherical nat. = Natural b-p = By-product mfd. = Manufactured

•Consult OSHA regulations before using silica sand as a blast abrasive.

Typical ID to OD Relationship in Common Blast Hose

Standard Hose (4-Ply)		Whip Hose (Lightweight 2-Ply)	
ID	**OD**	**ID**	**OD**
1/2"	1-5/32"	1/2"	1-1/16"
3/4"	1-1/2"		
1"	1-7/8"		
1-1/4"	2-5/32"	1-1/4"	1-7/8"
1-1/2"	2-3/8"		

Component Compatibility Guide

No.	Nozzle Orifice	Recommended cfm Range	Minimum Blast Machine Capacity	Minimum Piping ID	Blast Hose ID	Minimum Air Hose ID
3	3/16"	45 - 81	3 cu ft	1"	3/4"	1"
4	1/4"	81 - 137	3 cu ft	1"	1" - 1-1/4"	1-1/4"
5	5/16"	137 - 196	3 cu ft	1"	1" - 1-1/4"	1-1/4"
6	3/8"	196 - 254	6 cu ft	1-1/4"	1-1/4"	1-1/2"
7	7/16"	254 - 338	6 cu ft	1-1/4"	1-1/4" - 1-1/2"	2"
8	1/2"	338 - 548	6 cu ft	1-1/4"	1-1/2"	2"

Compressed Air and Abrasive Consumption

Nozzle Orifice	Pressure at the Nozzle (psi) 50	60	70	80	90	100	125	150	
No. 2 (1/8")	11	13	15	17	18.5	20	25	30	Air (cfm)
	.67	.77	.88	1.01	1.12	1.23	1.52	1.82	Abrasive (cu.ft./hr
	67	77	88	101	112	123	152	182	& Lbs/hr)
	2.5	3	3.5	4	4.5	5	5.5	6.6	Compressor hp
No. 3 (3/16")	26	30	33	38	41	45	55	66	Air (cfm)
	1.50	1.71	1.96	2.16	2.38	2.64	3.19	3.83	Abrasive (cu.ft./hr
	150	171	196	216	238	264	319	383	& Lbs/hr)
	6	7	8	9	10	10	12	14	Compressor hp
No. 4 (1/4")	47	54	61	68	74	81	98	118	Air (cfm)
	2.68	3.12	3.54	4.08	4.48	4.94	6.08	7.30	Abrasive (cu.ft./hr
	268	312	354	408	448	494	608	730	& Lbs/hr)
	11	12	14	16	17	18	22	26	Compressor hp
No. 5 (5/16")	77	89	101	113	126	137	168	202	Air (cfm)
	4.68	5.34	6.04	6.72	7.40	8.12	9.82	1.178	Abrasive (cu.ft./hr
	468	534	604	672	740	812	982	1,178	& Lbs/hr)
	18	20	23	26	28	31	37	44	Compressor hp
No. 6 (3/8")	108	126	143	161	173	196	237	284	Air (cfm)
	6.68	7.64	8.64	9.60	10.52	11.52	13.93	1.672	Abrasive (cu.ft./hr
	668	764	864	960	1052	1152	1393	1,672	& Lbs/hr)
	24	28	32	36	39	44	52	62	Compressor hp
No. 7 (7/16")	147	170	194	217	240	254	314	377	Air (cfm)
	8.96	10.32	11.76	13.12	14.48	15,84	19.31	2.317	Abrasive (cu.ft./hr
	896	1032	1176	1312	1448	1584	1931	2,317	& Lbs/hr)
	33	38	44	49	54	57	69	83	Compressor hp
No. 8 (1/2")	195	224	252	280	309	338	409	491	Air (cfm)
	11.60	13.36	15.12	16.80	18.56	20.24	24.59	2.951	Abrasive (cu.ft./hr
	1160	1336	1512	1680	1856	2024	2459	2951	& Lbs/hr)
	44	50	56	63	69	75	90	108	Compressor hp

Minimum Air Volume Table
Air Volume Requirements at 100 PSI for a Complete Blast System

Nozzle	Size of Orifice	Volume of Air	Plus Helmet	Plus 50% (reserve)	Minimum Air Required
No. 4	1/4"	81	20	50	151 cfm
	6.5mm	2.3	0.5	1.4	4.2 m^3/min
No. 5	5/16"	137	20	79	236 cfm
	8.0mm	3.9	0.5	2.2	6.6 m^3/min
No. 6	3/8"	196	20	108	324 cfm
	9.5mm	5.5	0.5	3.0	9.0 m^3/min
No. 7	7/16"	254	20	137	411 cfm
	11.0mm	7.2	0.5	3.9	11.6 m^3/min
No. 8	1/2"	338	20	179	537 cfm
	12.5mm	9.6	0.5	5.0	16.1 m^3/min

Metric Nozzle Chart
Compressor Air and Abrasive Consumption

Nozzle Orifice	Pressure at the Nozzle (bar & kPa) 3.5 350	4.2 420	4.9 490	5.6 560	6.3 630	7.0 700	8.6 860	10.3 1035	Requirements: Air (m^3/min) Abrasive (kg/h) * & kW
5mm (3/16")	0.73	0.84	0.92	1.06	1.15	1.26	1.54	1.82	Air (m^3/min)
	68	78	89	98	108	120	145	174	Abrasive (kg/h)
	4.5	5.3	5.6	6.4	7.1	7.5	9.0	10.8	kW
6.5mm (1/4")	1.31	1.51	1.71	1.90	2.08	2.27	2.75	3.22	Air (m^3/min)
	122	142	161	185	203	224	276	325	Abrasive (kg/h)
	7.9	9.0	10.1	11.6	12.4	13.5	16.2	19.4	kW
8mm (5/16")	2.16	2.50	2.83	3.16	3.53	3.84	4.71	5.57	Air (m^3/min)
	212	242	274	305	336	368	445	534	Abrasive (kg/h)
	13.1	15.0	19.1	20.2	21.0	22.9	27.5	33.0	kW
9.5mm (3/8")	3.02	3.53	4.00	4.50	4.85	5.50	6.64	7.79	Air (m^3/min)
	303	347	392	435	477	573	632	758	Abrasive (kg/h)
	18.0	21.0	24.0	27.0	28.9	33.0	39.6	47.5	kW
11mm (7/16")	4.12	4.76	5.44	6.09	6.73	7.11	8.80	10.48	Air (m^3/min)
	406	468	533	595	657	719	876	1040	Abrasive (kg/h)
	24.8	28.5	32.6	36.4	40.1	42.4	50.9	61.1	kW
12.5mm (1/2")	5.46	6.28	7.06	7.85	8.65	9.46	11.46	13.45	Air (m^3/min)
	526	606	686	762	842	918	1115	1333	Abrasive (kg/h)
	32.6	37.5	42.0	46.9	51.8	56.3	67.6	81.1	kW

* Based on abrasive with a density of 1.5 kg per liter.

Effect of Nozzle Wear on Air Consumption

Nozzle Size.	Orifice size inches	metric	Air Flow in cfm	Increase in Air Consumption
4	1/4	6.5mm	81 cfm	
5	5/16	8.0mm	137 cfm	**69%** more than No. 4
6	3/8	9.5mm	196 cfm	**43%** more than No. 5
7	7/16	11.0mm	254 cfm	**29%** more than No. 6
8	1/2	12.5mm	338 cfm	**33%** more than No. 7

Information shown is based upon air consumption at 100 psi (7 bar/700kPa)

Minimum Compressor Air Line Sizes

Nozzle No.	Nozzle Orifice Size	Minimum Air Line ID
No. 3	3/16" (5.0mm)	1" (25.0mm)
No. 4	1/4" (6.5mm)	1" (25.0mm)
No. 5	5/16" (8.0mm)	1-1/4" (32.0mm)
No. 6	3/8" (9.5mm)	1-1/2" (38.0mm)
No. 7	7/16" (11.0mm)	2" (50.0mm)
No. 8	1/2" (12.5mm)	2" (50.0mm)
No. 10	5/8" (16.0mm)	2-1/2" (64.0mm)
No. 12	3/4" (19.0mm)	3" (76.0mm)

Minimum Connector ID by Nozzle Orifice Size

Nozzle Orifice Size		Minimum Connector ID
3	3/16" (5mm)	3/4" (19mm)
4	1/4" (6.5mm)	1" (25mm)
5	5/16" (8mm)	1-1/4" (32mm)
6	3/8" (9.5mm)	1-1/2" (38mm)
7	7/16" (11mm)	2" (50mm)
8	1/2" (12.5mm)	2" (50mm)
10	5/8" (16mm)	2-1/2" (64mm)
12	3/4" (19mm)	3" (76mm)

Approximate Pressure Loss Caused by Commonly Used Fittings

based on 100 psi (7 bar) in 1" (25mm) pipe

Fitting	Pressure Loss
90° pipe elbow	3 psi (0.2 bar/21 kPa)
pipe tee	5 psi (0.3 bar/34 kPa)
45° pipe elbow	1-1/2 psi (0.1 bar/10 kPa)
swing check valve	18 psi (1.2 bar/124 kPa)

Internal Area Loss Due to Hose Size Reduction

Main Hose Size	Whip Hose Size	% of reduction
2" (50mm)	1-1/2" (38mm)	44%
2" (50mm)	1-1/4" (32mm)	61%
1-1/2" (38mm)	1-1/4" (32mm)	31%
1-1/2" (38mm)	1" (25mm)	56%
1-1/4" (32mm)	1" (25mm)	36%
1-1/4" (32mm)	3/4" (19mm)	64%
1" (25mm)	3/4" (19mm)	44%