

# **BLAST CLEANING EQUIPMENT OPERATING AND MAINTENANCE MANUAL ULTRABLAST SINGLE CHAMBER BLAST MACHINE**

## **MODELS COVERED**

**U-350 U-350LP U-500 U-650LP U-700 U-1000**

**THIS MANUAL COVERS THE ABOVE MODELS AS WELL  
AS ANY CUSTOMER UNITS WITH THE “ULTRASAFE”  
REMOTE CONTROL SYSTEMS INDICATED BELOW.**

**RFS-14 ULTRASAFE TANK UNDER PRESSURE SYSTEM  
RFE-14 ULTRASAFE TANK EXHAUST SYSTEM**

### **CAUTION**

**IMPROPER USE OF PRESSURE BLAST CLEANING  
EQUIPMENT CAN BE EXTREMELY HAZARDOUS. THIS  
MANUAL IS PROVIDED TO ASSIST IN THE SAFE  
OPERATION OF TITAN ULTRABLAST ABRASIVE BLAST  
CLEANING MACHINES. PLEASE READ CAREFULLY  
BEFORE PROCEEDING.**

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## MACHINE OPERATION

TITAN ULTRABLAST MACHINES are complete with a standard ULTRASAFE REMOTE CONTROL SYSTEM. Two systems are available: The standard RFS-14 RANK UNDER PRESSURE SYSTEM maintains full pressure in the tank (even when not blasting) at all times except when refilling the tank, or the optional RFE-14 TANK EXHAUST SYSTEM which depressurizes the tank each time the operator wants to stop. Both systems are controlled by valves which are spring loaded to remain closed. These valves are opened by air pressure from a Deadman Control Switch that must be held closed to continue blasting.

By any definition these systems are “failsafe” in operation meaning any component failure will cause the machine to shut down. These systems are in full compliance with existing Federal regulations (OSHA) for pressure blast cleaning equipment.

SPECIAL NOTE: THE OPERATING RANGE OF THESE SYSTEMS IS 60-120 P.S.I. YOU MUST STAY WITHIN THIS RANGE FOR SAFE OPERATION. OTHER RANGES ARE AVAILABLE.

## GENERAL PREPARATION

Reference diagrams: Fig. 1 Remote Control System Diagrams and Fig. 2 Coupling Installation.

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. Connect the hose end coupling to the blast tank coupling at connection point (E) on the System Diagram. 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 for more detail.
2. **BLAST NOZZLE** – Before installing in the nozzle coupling the threads should be coated with an anti-seize compound. Insert a nozzle gasket between the hose and nozzle and tighten to contact then add ¼ turn. **DO NOT OVER TIGHTEN!**
3. **MAIN AIR SUPPLY** – At distances up to 100’ from the air source the smallest diameter inside the supply air hose, including the couplings, should be at least as large as the blast machine piping. Connect the hose to the blast machine at connection point (B) on the System Diagram.
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 6053 TWIN CONTROL LINE to the open threaded fittings. Refer to the diagram for your system for the correct location. 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 CONTROL LINE should be loosely strapped to the blast hose so the twin line is not crushed when the blast hose is turned.

**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.**

### **HOURLY OR AS NEEDED**

MOISTURE SEPARATORS – Depending upon options ordered the blast machine could be equipped with manual or automatic drain separators on the main air supply line. Manual drain models should be checked hourly.

### **DAILY**

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.

### **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 indefinitely. 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.

BLAST TANK INTERNAL COMPONENTS -SEALING O-RING 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.

### **CONNECTION PROCEDURES FOR THE OPTIONAL OSHA/NIOSH RESPIRATORY COMPLIANCE PACKAGES SHOWN BELOW.**

PACKAGE “HP” –NO. 178 (BULLARD 88SH) SUPPLIED AIR RESPIRATOR AND 41AC AIR LINE FILTER USING A SOURCE MONITORED FOR THE PRESENCE OF CARBON MONOXIDE. From the source connect an air supply line of at least ¾” I.D. to the 41 AC Air Line Filter. Follow the instructions packaged with the respirator selected.

PACKAGE “LP” –NO. 178L SUPPLIED AIR RESPIRATOR WITH SELF CONTAINED BULLARD “FREE AIR” PUMP. Place the pump in a location away from vehicle exhausts or other source of carbon monoxide (CO). Although the pump will not produce CO internally, CO that is introduced through the pump inlet will not be removed by the pump filters. Detailed instructions are included with each pump.

### **WARNING: 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.

## **FINAL PREPARATIONS**

Reference: Fig. 1 Remote Control System Diagrams

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 (E)** – Initial setting should be 2-3 turns counterclockwise from fully closed. See the FINE TUNING section for later settings.
4. **CLOSE MANUAL EXHAUST VALVE (A)** – On RFS-14 Systems only.
5. **TURN ON AIR FROM COMPRESSOR** – This will pressurized all lines up to the Manual Air Inlet Valve. **DO NOT EXCEED 120 P.S.I. INLET AIR PRESSURE**

### **OPERATION WITH RFS-14 ULTRASAFE REMOTE CONTROL SYSTEM (TANK UNDER PRESSURE)**

The RFS-14 Remote Control System consists of a 5720-17 Air Inlet Valve and a 5700-17 Abrasive Regulator. Both 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 Deadman continuously engaged to operate the blast cleaning machine.

When the operator releases the Deadman Switch the air signal is interrupted, the spring tension closes the Air Inlet valve and the Abrasive Regulator and blast cleaning is stopped. This system maintains full working pressure in the tank when blasting is stopped. Tank pressure is relieved through a manual exhaust valve when it is necessary to refill the tank or leave the machine unattended.

### **TO START – UNIT HAS BEEN DEPRESSURIZED**

1. **BLAST HOSE AND NOZZLE** – Should be held securely at the nozzle end and directed away from personnel and equipment.
2. **OPEN MANUAL AIR INLET 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.**

3. **ACTIVATE DEADMAN CONTROL SWITCH** – Before the switch can be activated the safety button must be pressed into the side of the switch body to allow clearance for the operating handle. Depress the operating handle, blasting will start when the blast tank is pressurized.

#### **TO STOP**

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

#### **TO RESTART – WHEN TANK IS PRESSURIZED**

**ACTIVATE 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. **SLOWLY – OPEN MANUAL EXHAUST VALVE (A) TO DEPRESSURIZE THE TANK-**  
**CAUTION: HIGH PRESSURE AIR, WHICH MAY CONTAIN PARTICLES OF ABRASIVE,**  
**WILL EXIT THE TANK THROUGH THIS VALVE.**
3. **CLOSE MANUAL MAIN AIR CONTROL VALVE (B)** – A precaution should someone accidentally depress the deadman switch while the tank is being filled.

#### **TO RESTART – AFTER REFILLING**

**PROCEDURE IS THE SAME AS THE INITIAL START**

#### **LEAVING THE UNIT UNATTENDED**

**PROCEDURE IS THE SAME AS FOR REFILLING**

#### **FINE TUNING**

Reference: Fig. 1 Remote Control System Diagram

1. **5720-17 AIR INLET VALVE (B)** – No adjustment is possible except for the preload on the spring.
2. **5700-17 ABRASIVE REGULATOR (E)** – Turn crank handle clockwise to decrease the abrasive flow, counterclockwise to increase. When properly adjusted abrasive should be easily visible in the air flow from the nozzle. The chart in our catalog indicates the correct abrasive 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. **CHOKER 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 Choker 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 hopefully force the obstruction through the abrasive regulator.

If the choke valve operation will not restore the abrasive flow the unit is clogged (assuming it is not out of abrasive). 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.

### **SYSTEM MALFUNCTION**

1. **BLASTING STOPS, DEADMAN SWITCH IS DEPRESSED** – Indicates loss of pilot line air pressure. Check the condition of the 6106 Sealing Bumper in the Deadman Control Switch Handle.

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 is abrasive flow is the problem an obstruction in the abrasive regulator. Also check Spring preload adjustment if the valve has recently been disassembled.

### **MAINTENANCE**

**DAILY** – Check condition of all pilot lines and fittings. Check operation of the Safety Button on the 6100 Deadman Switch.

**WEEKLY** – Check 6101 Sealing Bumper for wear on the 6100 Deadman Switch.

EVERY 200 HOURS OF OPERATION – Following the disassembly instructions remove cover from the 5700-17 Abrasive Regulator and the 5720-17 Air Inlet Valve. Check the condition of the following parts: 5791 Valve Ball and Stem, 5712 Diaphragms and the 5755 Valve Seat. Valve should be thoroughly cleaned before reassembly. This is an excellent time to wash the accumulated residue from the inside of the blast tank and the body of the Abrasive Regulator.

EVERY 1000 HOURS OF OPERATION – Following the disassembly instructions replace the 5780 Valve Spring in the 5720-17 Inlet Valve and the 5700-17 Abrasive Regulator.

### **OPERATION WITH THE OPTIONAL RFE-14 REMOTE CONTROL SYSTEM (TANK EXHAUST)**

The TITAN RFE-14 Remote Control System consists of a spring closed 5720-17 Air Inlet Valve, acting on the incoming air source, and a 5720 Air Exhaust Valve which holds or relieves pressure in the tank. Both of these valves are controlled by air pressure from the 6100 Deadman Control Switch, which must be held in the closed position for blasting to continue.

When the operator depresses the Deadman Switch air pressure is introduced to the tank and the Exhaust Valve is closed allowing the tank to pressurize. When the operator releases the Deadman Switch the Inlet Valve closes and the Exhaust Valve depressurizes the tank. This shuts off the blast machine and allows the operator to fill the unit if it is low.

#### **TO START – INITIAL OPERATION**

1. OPEN THE MANUAL AIR INLET VALVE.
2. DEPRESS THE DEADMAN CONTROL SWITCH – Remember to press the Safety Button first. The unit will now start as soon as it is pressurized.

#### **TO STOP**

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

#### **TO START – ANY OTHER TIME**

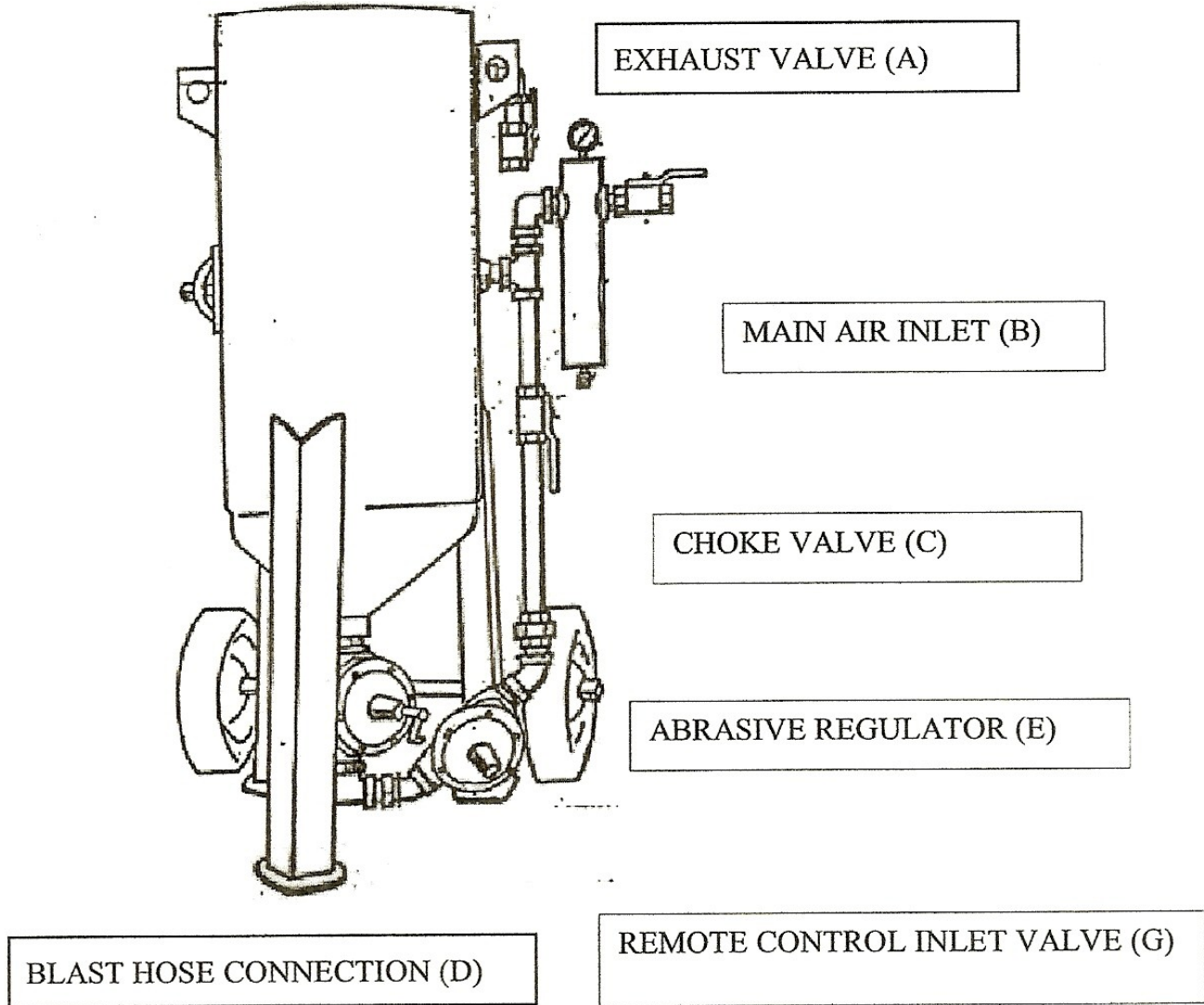
1. DEPRESS THE DEADMAN CONTROL SWITCH.

## **SYSTEM MALFUNCTION**

1. WITH THE 6100 DEADMAN SWITCH DEPRESSED, THE 5720 EXHAUST VALVE OPENS AND BLASTING STOPS – Indicates loss of pilot line air pressure. Check the condition of the 6106 Sealing Bumper in the Deadman Switch Handle or the 6053 Twin Line Control Hose for kinking or significant leaks.
2. WITH THE DEADMAN SWITCH DEPRESSED BLASTING STOPS, EXHAUST VALVE REMAINS CLOSED –Indicates ruptured outer 5712 Diaphragm in the 5720 Air Inlet Valve. Exhaust Air from machine, close Manual Air Inlet Valve and disassemble the 5720-17 Valve in accordance with instructions under breakdown diagram.
3. MACHINE LEAKS AIR AT THE 5720 EXHAUST VALVE – 5711 Valve Ball and Stem may be worn. Close Manual Air Inlet Valve, remove Valve Cover and inspect. Could also indicate a ruptured 5712 Diaphragm and these should also be examined carefully.

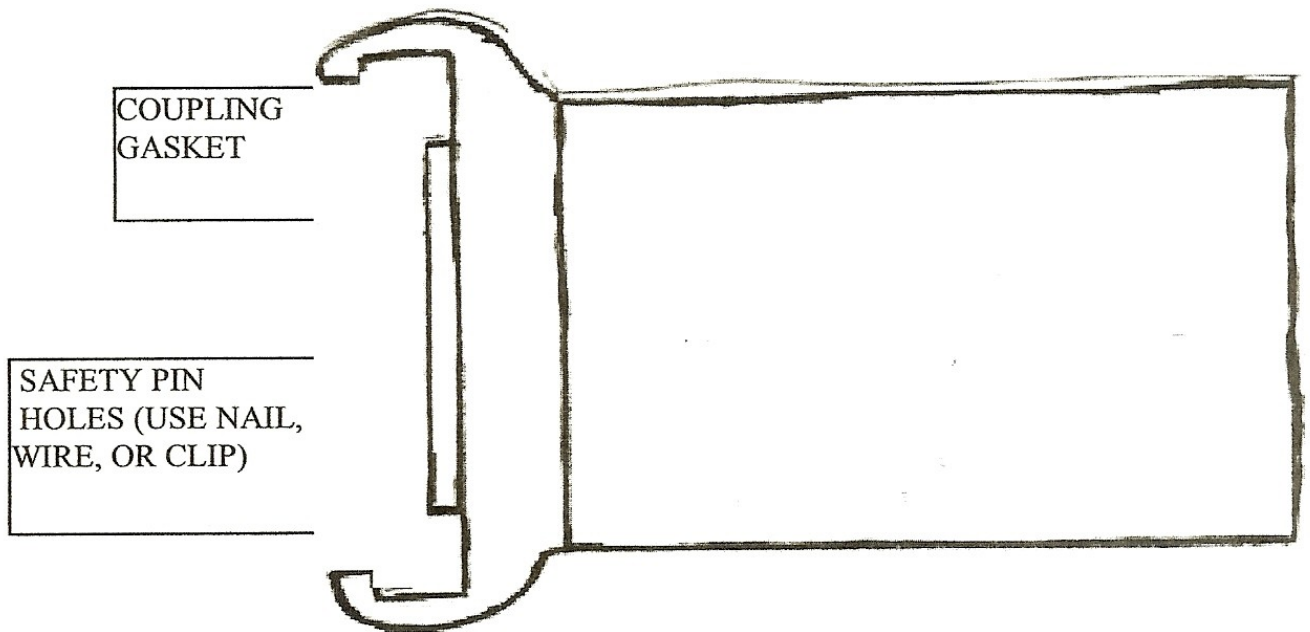
# BLAST CLEANING EQUIPMENT

FIGURE 1 SYSTEM DIAGRAM



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## COUPLING INSTALLATION (FIGURE 2)



**HOSE MUST BE CUT CLEAN AND SQUARE.  
HOSE MUST BE TIGHT AGAINST INTERIOR  
WALL OF COUPLING.**

**SHEET METAL SCREWS**

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