Surface Finishing Equipment Group

OPERATING INSTRUCTIONS

SATBLAST SYSTEM

Models : SAT B50–MKII / SAT B50–MKII ATEX
SAT B100–MKII / SAT B100–MKII ATEX

WARNING

READ AND FOLLOW ALL INSTRUCTIONS AND SAFETY PRECAUTIONS BEFORE INSTALLING OR OPERATING THIS EQUIPMENT.
KEEP THIS MANUAL READILY AVAILABLE FOR FUTURE REFERENCE.

It is the responsibility of the employer to place this manual in the hands of the operator. This manual must be kept in a place available to those using and affected by this equipment at all times during the life of this equipment. Failure to comply with these instructions can result in serious injury or death to the operator or those in the vicinity of the equipment.

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SAFETY PRECAUTIONS FOR ALL MODELS

FAILURE TO USE THIS MACHINE IN ACCORDANCE WITH THIS MANUAL CAN RESULT IN SERIOUS INJURY. READ THE FOLLOWING CAREFULLY BEFORE YOU ATTEMPT TO OPERATE THE MACHINE.

- This equipment must be only used by competent operators who are properly skilled, duly trained, and have read and understood the operating and safety instructions, including the Electrostatics Code PD CLC/TR 50404 for the ATEX models.
- Never attempt to perform any maintenance or refilling while the Machine is under pressure or is even capable of being pressurised. This means the air source should be isolated by closing the inlet ball valve and disconnecting the air supply line. The emergency stop on the deadman valve should be opened to release any residual pressure in the system.
- Keep This Operators Manual Available To Users At All Times.
- Static electricity can be generated by the friction of abrasive particles passing through hose or nozzles, and the impact of the abrasives on the surfaces being blasted. Static electricity can shock employees and cause fires and explosions by igniting flammable / combustible atmospheres or materials.
- This equipment should be used in a well lit area.
- Make sure that the unit is situated on a flat sturdy surface.
- Warning - for hoisting, the lifting lugs providing on the machine must be used. Do not connect slings to other parts of the machine. Always disconnect ancillary hoses etc. From the machine and ensure the machine is empty prior to moving.
- Use only original equipment replacement components.
- Make sure the unit is earthed.
- All airlines and couplings should be fitted with whip-check safety devices.
- Do not use abrasives containing free silica which can result to serious respiratory disease. If in doubt ask for an MSDS (material safety data sheet).
- Furnish all personnel in the area with approved respiratory equipment, eye and ear protection and ensure that these are worn.
- Do not modify or substitute any equipment or controls supplied on or with the equipment without our prior written assessment and consent.
- If the machine is dismantled / decommissioned, ensure it complies with your local environmental laws.
- Never point the blast nozzle at any person. Always keep the nozzle pointed at the work piece.
- Never connect the pot to a compressed air supply in excess of the Safe Working Pressure as stamped on the machine (normally 8.7 bar). If in doubt, or this is obscured, check with the manufacturer.
- DANGER When using mobile diesel air compressors, always site the compressor away from the blast area and outside in a well ventilated area, to avoid any exhaust fumes being drawn into the compressor air intake. All standard breathing air filters DO NOT remove carbon monoxide from the air supply.
- The operation of this equipment can generate noise levels which can be damaging to the ears. It is essential that the operator, pot tender and all other personnel in the vicinity be made aware of this and that suitable ear defenders are worn.
- Media ricochet generated from the blast cleaning operation can be dangerous and all personnel within the area must wear adequate protection.
- Signs warning of these dangers must be positioned around the perimeter of the blasting operation and measures must be taken to ensure that no one enters the area of the blasting operation without permission and adequate safety protection equipment. Should anyone enter the area, the pot tender must immediately close down the blasting operation by depressing the emergency button on the control panel and / or the blaster must release the lever of the deadman handle.
- Communication - it may be necessary that the blaster and pot tender operate some form of signalling or communication system. Under operating conditions where the blaster is not in constant view of the pot tender it is strongly recommended that a wired / radio communication system be used.

ADDITIONAL SAFETY PRECAUTIONS WHEN WORKING POTENTIALLY EXPLOSIVE ATMOSPHERES

IGNITION OF FLAMMABLE / COMBUSTIBLE ATMOSPHERES CAN OCCUR FROM SOURCES SUCH AS STATIC DISCHARGE, SPARKS FROM MECHANICAL IMPACT, AND SURFACES REACHING HIGH TEMPERATURES.

FAILURE TO USE THIS MACHINE IN POTENTIALLY EXPLOSIVE ATMOSPHERES IN ACCORDANCE WITH THIS MANUAL CAN RESULT IN SERIOUS INJURY OR DEATH.

IN EXPLOSIVE POTENTIALLY ATMOSPHERES :-

- Only use the ATEX versions of this machine (SAT B50–MKII ATEX and SAT B100–MKII ATEX) which are  II 2G **c** T6 rated models.

- Operate only in ambient temperatures between 5^{O}c and 40^{O}c
- Only use anti static Blast Hose with Metal couplings as supplied by the manufacturer.

- Do not use this machine to in Dry Blast Mode (use in Wet Blast Mode only). Dry abrasives have the potentially to cause static charge by friction.

- Do not use METALLIC abrasives such as chilled iron, steel shot, or aluminium oxide.

- **STATIC** – Static is a potential source of ignition in a potentially explosive atmosphere and therefore this equipment must be earthed. Earthing reduces the risk of static and electric shock by providing an escape wire for the electrical current due to static build up or in the event of a short circuit.

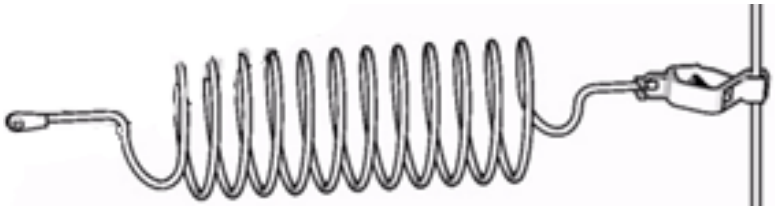
HOW TO EARTH THE MACHINE-

Refer to KEY PARTS & CONTROLS (Figure 1) – Page 8.

Attach one end of the Earth Wire (item 17) to the Earthing Point (item 16) on the SAT Blast, making sure there is good metal to metal contact. Connect the other end of the earth wire to a true earth ground using the securing clip.

GROUND POINT ON MACHINE

EARTH POINT



- **GROUNDING** - additionally the object being blasted must be grounded. Again this can be done by attaching a ground wire from a conductive point on the object being blasted to a true earth ground.

SAFE PRACTICES

- Never attempt to perform any maintenance while the unit is under pressure or is even capable of being pressurised. This means at a minimum the inlet ball valve should be closed and the air source be shut off or disconnected. The Start / Stop on the control panel should be in the off position. The deadman valve should be opened to release any residual pressure.
- Wear suitable eye protection when filling the unit. There is a possibility that some abrasive may be blown back as the pop-up valve seats.
- Do not use the Machine for extended periods of time.
- Always keep fingers well clear of the working area of the pop-up valve.
- Periodically check all hoses to see that they are in good condition. Repair any valves or hoses that show signs of wear or leakage.
- Check daily the blast nozzle. Replace immediately if any cracks however slight have appeared to avoid any possible disintegration of the nozzle.
- All blast hose couplings and some air hose couplings are provided with holes through which a wire or a pin should be inserted to prevent accidental disconnections.
- A back thrust is created by the action of compressed air passing through the nozzle, therefore the operator must ensure he has adopted a safe stance and position and must maintain a firm hold of the nozzle holder / blast hose.
- The interior condition of the vessel should be inspected regularly for corrosion.
- All blast operators should be supplied with and use approved respiratory equipment, protective clothing, helmet, ear protection and gloves.
- Whilst wearing standard blast cleaning helmets always ensure that:

  a. A Filtered Air Supply is used.
  b. A correctly fitted inner shatterproof visor is used to ensure operator eye protection.
  c. A disposable external visor is fitted to protect the inner visor.
  d. Ear plugs or ear defenders are worn for additional ear protection.

- This information relates only to the noise level generated internally as a result of the introduction of breathing air. Additional ear protection may also be necessary if noise levels generated externally are above permitted levels.
- Whip checks must be used on all airlines/ airline connections.

INSPECTION REQUIREMENTS

- A blast pot is a pressure vessel and is subject to inspection as required by legislation.
- The owner is obliged to observe regulations governing pressure vessels of this type.
- You should advise your insurers of your purchase and ensure that this equipment is included in a written scheme of examination prepared by a qualified competent person.
- Visual inspections should be carrier out internally and externally by a competent qualified person. We recommend hydraulic pressure testing should be carried out at least once of every 12 months, or in accordance with your local / company / insurance regulations, whichever is sooner. This can be done at our facility. Please see contact details on the last page.
- Your insurers will advise on current legal requirements.
- Should any damage occur to the vessel then it should be taken out of service immediately and the manufacturer contacted for advice.

SPECIFICATIONS

This equipment conforms to the protection requirements of the following EC Council Directive on the approximation of the laws of the member states relating to the Safety of Machinery 98/37/EC by the application of standards EN ISO 12100 Parts 1 and 2: 2003 and EN ISO 12141: 2007

In addition the ATEX version when used in full accordance with the manual conforms to the essential safety requirements of Group II Category 2G T6 of the following EC Council Directive on the approximation of the laws of the member states relating to the 94/9/EC: Equipment & Protective Systems Intended For Use In Potentially Explosive Atmospheres by the application of standards EN 13463-1: 2009 and EN 13463-5: 2003 and EN 15198: 2007.

A technical dossier has been lodged with the following notified body.

BSI Product Services (EU Notified Body No. 0086)
Marylands Avenue, Hemel Hempstead, Hertfordshire HP2 4SQ.

MAXIMUM SAFE WORKING PRESSURE – as specified on machine plate. Normally 7.9 Bar

WORKING TEMPERATURE – operate only in ambient temperatures between 5^{o}c and 40^{o}c

TYPICAL WEIGHTS AND DIMENSIONS

Model	Number	Weight	Height	Width	Depth
SAT BLAST	B50 MK II	120 kg	1.15 m	0.60 m	0.95 m
SAT BLAST	B100 MK II	190 kg	1.35 m	0.80 m	1.10 m

APPROXIMATE ABRASIVE CAPACITY -

SAT B50 Mk II - 50 kg plus water
SAT B100 Mk II - 100 kg plus water

RECOMMENDED ABRASIVE MEDIA

Do not use abrasives containing free silica which can result to serious respiratory disease. If in doubt ask for an MSDS (material safety data sheet).

- Silica-Free Sand Grade Media such as ABRABLAST FINE
- Stone Grit Fine/Extra Fine
- Garnet.
- Very Fine Grits/ Mineral Slags

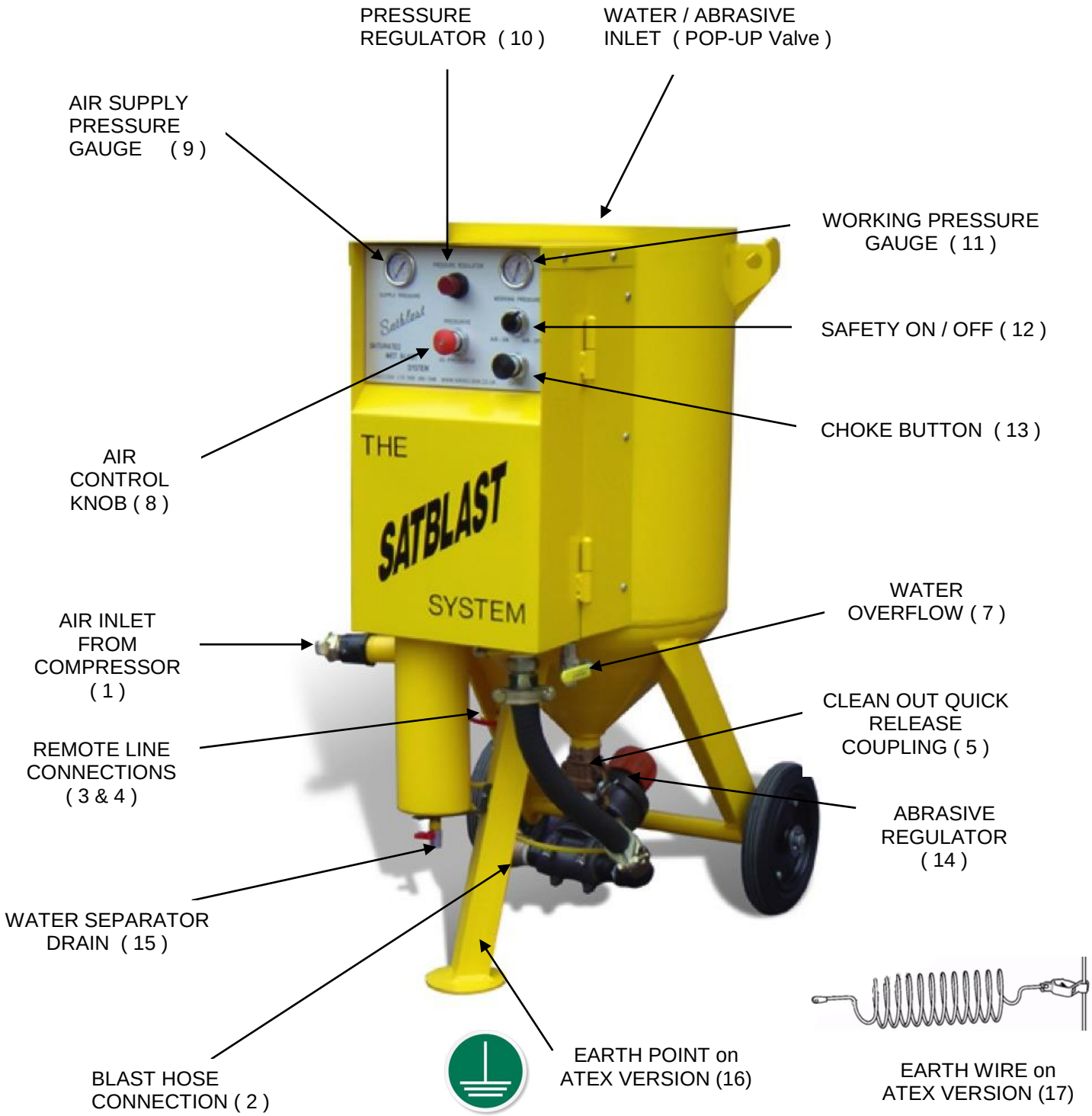
This system is designed for use with FINE media in a saturated form, NOT medium or coarse grits / mineral slags.

- DO NOT use metallic abrasives with this machine.

INTENDED FUNCTION OF EQUIPMENT

The SATblast System is designed for wet blast cleaning using saturated abrasive media conveyed by compressed air to the surface being cleaned.

KEY PARTS & CONTROLS (Figure 1)



SETTING UP INSTRUCTIONS

These instruction apply to all variants of the SATBlast machine.

For additional precautions when Working In Potentially Explosive Atmospheres please see page 4-5.

- Locate the SAT Blast machine in a stable position on firm level ground.
- If static is potential problem ensure that the machine is adequately earthed and use anti-static blast hose.
- Refer to the air fed helmet manufacturer's owner's manual.
- Read the INITIAL SET-UP AND ROUTINE CHECKS shown later in the manual.

CONNECTIONS

- Clean compressed air services are required to operate this machine. Contaminated air must not be used due to detrimental effects, which may occur to the equipment and surface being prepared.
- Connect air supply from compressor to the SAT Blast Air Inlet (1) claw air/water separator. Fit whip checks on all airlines/ airline connections.
- Connect blast hose onto blast hose connection (2) and check all hose and couplings are secure. Fit safety pins into the holes in the couplings.
- Connect the two deadman handle remote lines (normally yellow and green) onto the manifold mounted pot connections (3 and 4).
- Connect the twin remote lines to the connections on the remote control valve. The lower connection is the supply air and the upper connection is the return air from the deadman handle (situated next to the blast nozzle).
- NOTE : With some fold over type deadman handles the remote lines may be connected to either fitting, but for certain makes of safety deadman handles. It is important that the feed and return lines are connected the correct way around.
- Ensure the quick release clean out coupling (5) is locked firmly in position.

FILLING

- Open overflow valve (7).
- Fill the system with water through the opening in the dished end at the top of the unit (pop-up valve).

  When overflow occurs :-
  - Stop filling the system with water.
  - Wait until overflow stops running.
  - Close overflow valve (handle horizontal)
- Load the correct amount of abrasive into the top of the system (50kg). This weight will vary according to the bulk density of the material.
- DO NOT OVERFILL

The abrasive should be covered with a **minimum** of 1" or 25mm of water.

SAFETY ON/OFF SWITCH

- To stop the blasting process at the control panel turn the safety switch (12) to the OFF position.
- This will stop the blasting process but the system will still remain pressurised.
- However if the Air Control Knob (8) is pushed in to the DE-PRESSURISED position this will not only stop the blasting operation, but will also de-pressurise the systems main tank.

STARTING TO BLAST

- Refer to the compressor manufacturer's operating instructions and start the compressor.
- Be sure that the lever on the deadman handle is NOT depressed. Always check before connecting remote lines. DANGER - some deadman handles must be connected the correct way round - check for the type of handle which you are using.
- Switch on the air supply from the compressor.
- Ensure air control knob (8) is in the de-pressurise position (Pushed Down).
- Ensure the safety on/off switch is in the OFF position.
- Open the abrasive regulator valve control knob (14) by 3 full turns anti-clockwise from fully closed.

  WARNING
  ENSURE ALL FINGERS/HANDS ARE WELL CLEAR OF THE POP-UP VALVE BEFORE PRESSURISING THE SYSTEM.
- Ensure fingers are clear, then turn control knob (8) to the pressurise position (Twist Anti-Clockwise)
- Turn the pressure regulator control (10) to the required blast pressure, as shown on gauge (11).
- Ensure the blast hose and nozzle/lance is held firmly and pointed in the required direction.
- Turn the safety on/off switch (12) to the ON position.
- Ensure the nozzle/lance is pointing at the work piece and operate the deadman handle, to commence the blasting operation.
- Adjust the abrasive control valve (14) until the required amount of media is obtained. (This may require the operative to release the deadmans handle to enable the control knob to be adjusted, only adjust by half of one full turn at a time).
- If during the blasting operation, the abrasive flow is intermittent, or stops, and you know abrasive is in the system. Whilst blasting push the choke button (13) in for two seconds and release. This should cause a slight surge of abrasive, then blasting should continue as normal.

TO RE-FILL SYSTEM

- Release deadman handle.
- Push control knob (8) to de-pressurise, the system will then de-pressurise.
- Then follow section "FILLING" point 1. onwards.

TO WASH DOWN CLEANED SURFACES

- Follow section "TO RE-FILL SYSTEM" points 1. & 2.
- Remove drain coupling (5) and flush the system with clean water.
- Replace the drain coupling (5).
- Open overflow valve (7).
- Fill the system with clean water through the pop-up valve in the top of the system.
- When overflow occurs through the overflow valve (7) stop filling through the pop-up valve and close overflow valve (7) (handle horizontal).

  WARNING Ensure all fingers/hands are away from the pop-up valve
- Pressurise the system by turning the control knob (8) to PRESSURISE.
- Adjust the working pressure with the pressure regulator (10) to 10/20 psi as shown on gauge (11) for the best results.
- Adjust abrasive control valve (14) to give the required amount of wash down water.

  WARNING :- Some abrasive may still be in the blast hose, and will be blown out of the nozzle when first starting wash down procedure.

AFTER USE AND AT THE END OF SHIFT

- Turn the air control knob (8) to the de-pressurise position.
- Turn off the main air supply from the compressor.
- Remove and clean out coupling (5).
- Wash the remaining abrasive out of the vessel with water poured in through the top of the vessel.

ROUTINE MAINTENANCE

ENSURE THAT THE COMPRESSED AIR SUPPLY IS TURNED OFF AND ALL AIR LINES PURGED OF PRESSURE AND DISCONNECTED FROM THE BLAST MACHINE BEFORE ANY MAINTENANCE WORK IS CARRIED OUT. PRECAUTIONS SHOULD BE TAKEN TO PREVENT ACCIDENTAL TURNING ON OF THE COMPRESSED AIR SUPPLY.

All blast cleaning equipment is subject to wear, therefore for safety and efficiency, it is ESSENTIAL to operate a preventative maintenance programme. The degree of wear is variable, and is dependent upon many factors: - type and grade of media, blasting pressure, nozzle size, operator expertise, etc. and these factors should be taken into consideration when planning regular maintenance schedules. The following checklists are a basic guide to assist in planning maintenance schedules.

Note:

Maintenance should only be carried out by trained competent persons. This maintain can be done on site or at our facility. Please see contact details on the last page if this service is required.

INITIAL SET-UP AND ROUTINE CHECKS

DAILY

- Blast Hose – Check the blast hose to be used is in good condition along the entire length. Squeeze by hand to check for wear. Ensure that the blast hose ends are cut square and are located fully into the coupling and nozzle holder and up to the retaining shoulders within and that all the required hose retaining screws are in good condition and firmly secured in position. Lay out the blast hose from the machine to the work surface area, ensuring that no tight curves or kink occur and ensure that the hose is protected from possible damage.
- Couplings and Gaskets - check that the coupling gaskets on the claw couplings are in good condition and correctly seated in the coupling. Ensure that the couplings are securely locked and that each latching wire is located through the appropriate hole in the marrying coupling. If no integral means of wiring latching is provided, use split pins through the corresponding holes to ensure no accidental parting of the couplings can occur.
- Deadman (Remote Control) Hoses and Handle – ensure the remote control air hoses have no splits or leaks. Ensuring that the rubber insert is in position and that the blade opens freely by the action of the spring and closes freely. The hoses should be secured the remote control air hoses to the blast hose at short, regular intervals using hose ties. Take care not to compress the hoses by over-tightening.
- Check that the sealing ring (P-5) and pop up valve mushroom in the abrasive-filling orifice of the machine are in good condition and correctly positioned. This will involve unscrewing the 3 screws securing the safety cover. Remember to re-fix the safety cover after the inspection.
- Check wear on nozzle. Replace if necessary.
- Check and replace if necessary breathing air filter elements. (Where Used)
- Check the condition of the nozzle holder for wear and replace with new one if necessary.
- Check that the nozzle holder gasket is in good condition and ensure that it is in position. Renew if showing sign of wear. Ensure nozzle is securely located in to nozzle holder onto the gasket.
- Check that the inspection door assembly is correctly and securely fitted, the gasket is in position and that no leaks occur.
- Check seat in Abrasive Regulator (14) each month. To test pressurise the unit, remove blast hose from the bottom of the blast pot. If air leaks replace seat immediately. To replace the seat 149-10 in Thompson abrasive valve, depressurise the unit, isolate the air supply, uncouple the flexible pipe fittings and remove the valve from the machine. Remove cap and knob (2+1), remove four bolts (12), inspect items 10 &14 for wear, and replace if required. If item 10 is replaced as soon as any leakage is noticed item 14 will not normally need to be replaced. Reassemble in reverse order.
- Check drain on the water separator is clear; adjust until it is blowing slightly to remove moisture for the supply to the switches.

EVERY 3 MONTHS MAXIMUM

- Clean out the inside of the vessel, check for major scaling and/or build up of material.
- Lubricate all control panel switches with WD40 or similar.

EVERY 6 MONTHS MAXIMUM

- Strip, clean and lubricate all operating valves.
- Never attempt to strip or service items when the unit is connected to an air supply. If connected it should be assumed that the unit is capable of pressurising.

EVERY 2 YEARS MAXIMUM

- Return the unit to Manufacturer to have the shell re-pressure tested.

TROUBLE SHOOTING / FAULT ANALYSIS

WARNING: ENSURE THAT THE AIR SUPPLY AT THE COMPRESSOR IS TURNED OFF AND THE AIR LINE IS PURGED OF PRESSURE BEFORE REPAIR WORK IS CARRIED OUT.

Problem	**Possible Cause**	**Remedy**
Air blast but no abrasive / water flow	Thompson Valve not opening.	Check if adjusting knob is stiff when trying to blast.
	Air supply to Thompson	Check supply Valve leaking or disconnected hoses.
	Thompson Valve seal leaking.	Replace seal.
Blasting pressure reduces or fluctuates.	Compressor air supply hoses or connections are too small.	Use larger air supply hoses and ensure there are no restrictions caused by reduced sized fittings.
	Air compressor too small for nozzle size.	Use larger air supply.
	Remote line connections to the Deadman are loose or leaking.	Check, tighten or repair.
Unit will not pressurise.	Air supply not turned on.	Turn air supply on.
	Air supply too small volume.	Use a larger compressor.
Blasting operation will not turn on or is slow to turn on.	Air supply or hose too small.	Use larger compressor or hoses.
	Deadman control hoses are loose or leaking	Tighten or replace
	Deadman Handle is defective.	Service/replace as required.
	Defective diaphragm in air valve.	Replace seals.
Unit is slow to turn off.	Deadman Control hoses connected incorrectly	Swop over connections.
	Thompson Valve seal leaking.	Replace.
Unit turns on accidentally.	Deadman handle failing.	Service/repair.
Small amount of abrasive / water/ air blows out of nozzle when not blasting but unit pressurised	Thompson Valve seal leaking.	Close choke valve, if air stops, service side air valve if air continues replace seal.
	Side air valve leaking.	Service/repair

NAME AND ADDRESS OF MANUFACTURER

Manufactured by consisting of :-

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