



SAFE Systems, Inc.

Technical Bulletin

#6911 0000

Electric Deadman Switch



WARNING

Read and follow ALL instructions before using this equipment. Failure to comply with ALL instructions can result in serious injury or death. In the event that the user, or any assistants of the user of this equipment cannot read or cannot completely understand the warnings and information contained in these instructions, the employer of the user and his assistants must thoroughly educate and train them on the proper operation and safety procedures of this equipment.

NOTICE TO PURCHASERS AND USERS OF OUR PRODUCTS AND THIS INFORMATIONAL MATERIAL:

The products described in this material, and the information relating to those products, is intended for knowledgeable, experienced users of abrasive blasting equipment. No representation is intended or made as to the suitability of the products described herein for any particular purpose or application. No representations are intended or made as to the efficiency, production rate, or the useful life of the products described herein. Any estimate regarding production rates or production finishes are the responsibility of the user and must be derived solely from the user's experience and expertise, and must not be based on information in this material. The products described in this material may be combined by the user in a variety of ways for purposes determined solely by the user. No representations are intended or made as to the suitability or engineering balance of the combination of products determined by the user in his selection, nor as to the compliance with regulations or standard practice of such combinations of components or products. Abrasive blast equipment is only a component of the range of equipment used in an abrasive blasting job. Other products may include an air compressor, abrasive, scaffolding, hydraulic work platforms or booms, paint spray equipment, dehumidification equipment, air filters and receivers, lights, ventilation equipment, parts handling equipment, specialized respirators, or equipment that may have been supplied by others. Each manufacturer and supplier of the other products used in the abrasive blasting job must be contacted for information, training, instruction and warnings with regard to the proper and safe use of their equipment in the particular application for which the equipment is being used. The information provided by SAFE Systems is intended to provide instruction only on SAFE Systems' products. All operators must be trained in the proper, safe use of this equipment. It is the responsibility of the users to familiarize themselves with, and comply with, all appropriate laws, regulations and safe practices that apply to the use of these products. Consult with your employer about training programs and materials that are available. SAFE Systems, Inc. is proud to provide a variety of products to the abrasive blasting industry, and we have confidence that the professionals in our industry will utilize their knowledge and expertise in the safe, efficient use of these products.

This bulletin covers the installation, operation and maintenance of the SAFE Systems Deadman Switch, #6911-0000.

Keep this manual for future reference! For further

information contact:

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GENERAL INSTRUCTIONS

DO NOT modify or substitute any SAFE Systems' parts with other types or brands of equipment.

Described herein are some, BUT NOT ALL, of the major requirements of safe and productive use of SAFE Systems deadman remote control systems. Completely read ALL instruction manuals prior to using equipment.

The user's work environment may include certain HAZARDS related to the abrasive blasting operation. Proper protection for the blaster, as well as anyone else that may be exposed to the hazards generated by the blasting process, is the responsibility of the user and/or the employer. Operators MUST consult with their employer about what hazards may be present in the work environment including, but not limited to, exposure to dust that may contain TOXIC MATERIALS due to the presence of silica, cyanide, arsenic or other toxins in the abrasive, or materials present in the surface to be blasted such as lead or heavy metals in coatings. The environment may also include fumes that may be present from adjacent coatings application, contaminated water, engine exhaust, chemicals and asbestos. The work area may include PHYSICAL HAZARDS such as an uneven work surface, poor visibility, excess noise and electrical hazards. The operator MUST consult with his employer on the identification of potential hazards, and the appropriate measures and precautions that must be taken to protect the blaster and others that might be exposed to these hazards.

ALL machines, components and accessories MUST be installed, tested, operated and maintained only by trained, knowledgeable, experienced users.

HAZARD ALERTS

Certain signal words are used in this and other literature by SAFE Systems. The words are based on ANSI Z535.2-1991 and used to alert the user of potentially hazardous situations that may be encountered while operating this equipment. ANSI's definitions of the signal words are as follows:

NOTICE: "Notice" is used to indicate a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property.

CAUTION: "Caution" is used to indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

WARNING: "Warning" is used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.

DANGER: "Danger" is used to indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury.

BLAST MACHINES AND REMOTE CONTROLS



WARNING: Blast operators and others working in the vicinity of abrasive blasting must always wear properly-maintained, NIOSH-approved, respiratory protection appropriate for the job site hazards.



WARNING: DO NOT USE abrasives containing more than one percent crystalline (free) silica. Ref. NIOSH Alert #92-102. Inhalation of toxic dust (crystalline silica, asbestos, lead paint and other toxins) can lead to serious or fatal disease (silicosis, asbestosis, lead or other poisoning).



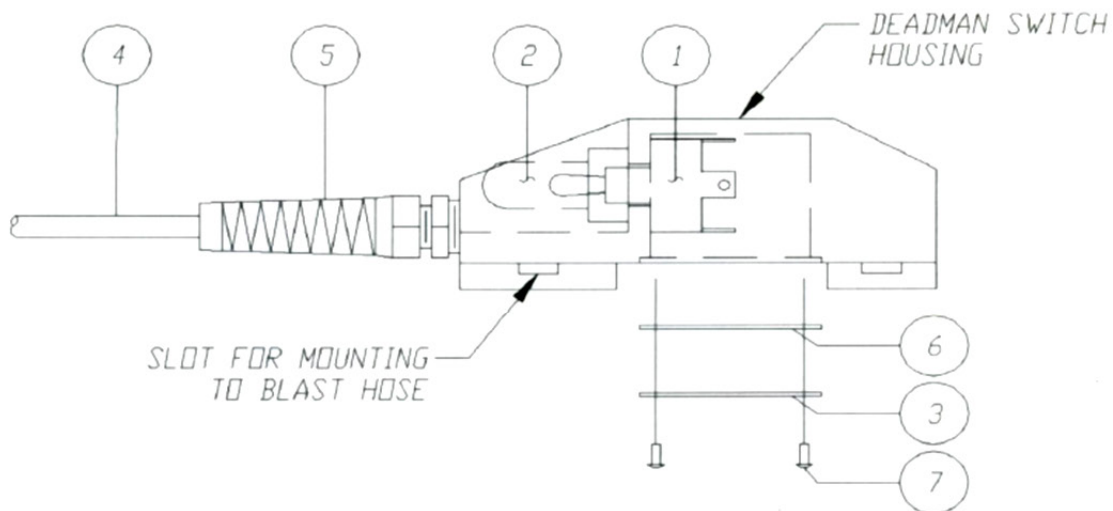
WARNING: ALWAYS equip abrasive blast machines with remote controls. NEVER modify or substitute remote control parts. Parts from other manufacturers are NOT compatible with SAFE Systems equipment. If controls are altered, involuntary activation, which may cause serious injury, can occur.



WARNING: Point nozzle ONLY at the workpiece being blasted. High velocity abrasive particles WILL inflict serious injury. Keep unprotected workers OUT of blast areas.



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Use only genuine SAFE Systems' replacement parts!

ITEM #	PART NO.	DESCRIPTION
	69110000	Complete Switch w/ 5' cord
Replacement Parts		
*1	69110002	Replaceable Toggle Switch
*2	69110003	Replaceable Switch Boot
*3	69110004	Switch Access Plate with Warning Decal
4	69110005	Special SJOW 16-2 Electrical Cord (5 ft. section)
*5	69110006	Special design 3/8" Strain Relief
*6	69110011	Access Plate Gasket
*7	69110018	Screw, pan head, stainless, 6-32 x 1/4" long
	69110020	Repair Kit, includes #1, #2, #3, #5, #6 & (2) #7
	69110007	Ball and Chain
	69110025	Bat and Chain

Do not use with any other ball and chain or bat and chain assembly.



WARNING: OSHA requires the use of remote controls on all blast machines. To comply with OSHA regulations, the remote control toggle switch which starts and stops the flow of air and abrasive, must be operated manually. Do not secure up or down the toggle switch or attempt to bypass any part of the remote control system. Doing so will defeat the purpose of the fail-to-safe feature of the deadman switch. Serious injury or death can result from uncontrolled blasting. Ref. 29CFR 1910.244(b).



WARNING: Moist air that freezes can cause blockage of the control air lines. Blockage could prevent the deadman switch from deactivating the blasting operation. Do not use in freezing conditions.



WARNING: Malfunctioning deadman switches can cause unintentional actuation of a blast machine or prevent a machine from deactivating upon release. Malfunctioning deadman switches must be taken out of service immediately and repaired or replaced. Serious injury or death can result from unintentional blasting.

NOTICE: The maximum recommended total length of control cable is 300 feet. Distances greater than 300 feet will offer too much electrical resistance and may cause the controls to malfunction. If an application requires greater distance, we suggest that appropriate cord with larger diameter wire and compatible connectors be provided by the end user.

NOTICE: Electric remote controls (electro-pneumatic) are recommended when the nozzle and remote control handle are farther than 50' from the blast machine. Pressure loss with pneumatic systems over longer distances increases actuation time which prevents fast, safe operation.

NOTICE: Provide sufficient slack at all cable connections to prevent the cable from pulling apart at a connection when the blast hose is pulled or dragged. Band the cable to the blast hose on both sides of all connections.

ELECTRIC DEADMAN SWITCH CONTROLS

Electric deadman switch controls are considered electro-pneumatic systems. Control wire runs from the deadman switch to the blast machine control box where it connects to a solenoid valve. The solenoid valve distributes control air to the desired locations to start and stop the blasting operation. When the control toggle switch is pressed down or up, the blasting begins. When the control toggle switch is released, a spring returns the toggle to the center position and abrasive flow to the nozzle stops.

GENERAL DESCRIPTION

A remote control system is an OSHA required safety device for all blast machines.

The principal components of the deadman switch are the control toggle switch, toggle boot, strain relief, access plate, access plate gasket, electrical cable and urethane body. The control toggle switch, is the main activator of the SAFE Systems deadman switch, located near the blast nozzle. When the toggle switch is in the center position, it is in the non-blast position. Pressing the toggle switch either down or up activates the control system that allows abrasive to flow under pressure.

When the operator removes the pressure from the control toggle switch, either intentionally or unintentionally, the machine deactivates, stopping the blast process. The remote control system "fails to safe", which means that an interruption in the electrical circuit to the deadman switch, for any reason, deactivates the blast machine. Unintentional interruptions in abrasive flow at the nozzle could be caused by a break in the remote control electrical line, a break in the blast hose, or loss of control of the blast hose by the operator. A false start of abrasive flow could be caused by a short in the electrical control cable to the deadman switch.

INSTALLATION

NOTICE: For best results, remove the 5' cord that is sent with the deadman switch and reconnect a control cable, 16-2 SJOW, of the proper length so there are no external connection points which may fail.

Using two or more nylon ties or steel worm clamps, band the switch to the blast hose. Pass the ties or clamps through the molded-in slots on the back of the urethane switch body and securely mount close to the nozzle holder. **THIS IS THE ONLY APPROVED LOCATION.** Once firmly affixed to the hose, clip the tie or clamp ends so they do not protrude. Protruding ends can be a safety hazard by snagging on operator clothing or interfering with operation of the switch.

Working from the deadman switch back toward the control box, band the cable to the blast hose just behind the deadman switch strain relief and then every four to six feet. (Duct tape may be used.) If external connections have been made in the cable, band securely on both sides of every connection.

TROUBLESHOOTING:

If the system fails to activate when the toggle switch has been pressed:

Check to see if it is the deadman switch itself by substituting a properly working deadman switch. If that is not possible, turn off the compressed air supply. Disconnect the deadman switch at the control cable. Open the deadman switch as described in Maintenance and verify that the connections are properly made and secure. Check continuity across the center and upper screw terminals of the toggle switch while pressing the toggle lever down. Repeat continuity test across center and lower terminals while pressing the toggle up. Check the cable. Verify that there are no breaks.

If the system activates unintentionally when toggle switch has not been pressed or does not deactivate when toggle switch is released:

Verify that the toggle switch is returning to center when pressure is released. If the toggle switch fails to return to the center (non-blast) position when released:
Check the toggle switch for damage or abrasive that may cause binding.
Replace the toggle switch, as needed.
Check the cable. Verify that there are no breaks *inside the jacket* that may be causing shorts.
Verify that all connections are properly made and secure.
Open the deadman switch as described in Maintenance and verify that the connections are properly made and secure.

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The switch was developed, designed and engineered based upon various parameters supplied by the customer for their specific needs. The basic design used is premised upon use in conjunction with customer provided equipment.

The following is a list of material and operational parameters established in order for the system to function properly.

- Type of abrasive Steel grit, Green Diamond, ALOX, garnet, Black Beauty, recycled glass
- Maximum and minimum ambient temperature 115°F and 40°F
- Proper size and type of electrical cable 16-2 SJOW.
- Remote controls must be in PERFECT operating condition. Use only approved SAFE Systems repair parts, including proper size and type of cable.
- Test the system daily at the beginning of each work period, as follows:
Make sure the deadman switch toggle returns to the center position when it is released.
Make sure the deadman toggle moves freely with no drag or binding.
Confirm the deadman toggle is in the center (no-blast) position, before applying air to the blast machine
- Complete maintenance records and daily operator logs must be filled out.
- Installation and operation manuals must be followed precisely.
- Only properly trained and experienced personnel may operate the system. Trained personnel qualified to operate the system will be presented by owner of the equipment.

The parameters as described above are extremely important to follow in order to validate the warranty of the equipment. Failure to comply with these parameters may result in inefficient/ineffective operation, system malfunction, premature equipment failure and/or unsafe conditions.

The operator must be trained in the safe operation of the remote control system, blast machine and all other equipment used. The operator must know about the hazards associated with abrasive blasting. To ensure safe blasting, before using the deadman switch, read the manuals for the specific blast machine, remote controls and accessories used.

CLEANING:

The control toggle switch is the actuator of the remote control system. Periodically clean around the toggle boot and switch to ensure that the unit is free of abrasive and debris that could cause the toggle to bind.

MAINTENANCE:

The deadman switch is a safety device. Inspect it before and after every use to ensure it is operating properly. The toggle switch must return to the center position when it is released and move freely with no binding or dragging.

To replace the toggle switch, clean the deadman switch thoroughly before opening it up. Abrasive will cause the toggle to prematurely fail. Steel abrasive can cause shorts inside the unit.

Remove the molded rubber boot and loosen the hex nut. Remove the access plate and gasket and disconnect the control wires. Remove the toggle switch, replace with a new toggle switch, reconnect securely and reassemble the unit.

