CSDA Best Practice

Title: **Introduction to Remote Control**
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Introduction
Concrete cutting equipment has become more advanced in recent years and some of this equipment can now be controlled at a distance via "remote control." The equipment to be operated may be electric, hydraulic or electric over hydraulic, pneumatic, and may contain a remote control feature that enables the user to stay at a safe operating distance. Wall saws, small flat saws and gas or electric hydraulic power packs are some of the types of equipment that can now be operated by remote control.

The purpose of this best practice document is to explain some of the different types of remote controls used and to provide some tips with regards to operating them in a safe manner.

1. Wired Remote Controls

A wired remote control is a device used by an operator that is usually hand-held or waist-mounted. It is connected to the piece of equipment by a power cord that is generally between 30 and 100 feet in length. The cord can contain as few as three electrical conductors or as many as 25 conductors. Switches on the remote control send electrical signals through the conductors to operate the equipment. Simple remote controls may contain as few as one or two switches while more complex remotes can contain six to ten switches or any combination of switches and speed control devices.

Remote controls can be low voltage DC or high voltage AC.

1.1. Low voltage DC remotes use signals that operate from 12-30V DC. Since the operator is always in contact with the remote, these voltages are, by far, the safest with regards to electrical shock in the event of a failure in the device. In addition, because of the low voltage range, there is less likelihood of interference with other electrical devices in the work area.

1.2. High voltage AC remotes use signals that operate from 110-125V AC. Greater care is required when using this type of remote because there is a higher risk of electrical shock to the operator in the event of a failure. The likelihood of electrical interference with other devices is also greater.

1.3. Safety considerations when using remote controls:
- 1.3.1. Check cords for nicks or cuts. Replace or repair if needed.
- 1.3.2. Protect cords from being damaged during operation of the equipment.
- 1.3.3. Make sure all equipment is properly grounded.
- 1.3.4. Keep all controls away from water and concrete slurry.
- 1.3.5. Maintain visual contact with the cutting equipment at all times while in operation.
- 1.3.6. Protect work area from entry of unauthorized personnel.

2. Wireless Remote Controls

Wireless remote controls operate on a predetermined radio frequency powered by a battery to control a piece of equipment. As with the wired remotes, wireless remote controls are usually hand-held or waist-mounted. When an operator activates switches on the remote control, radio control signals are sent to the receiver. The receiver then processes the signals to activate different functions for the piece of equipment. These radio signals can be transmitted on frequencies as high as 2.4GHz and can be sent as far as 800 feet depending on the design of the system. Wireless remote systems typically incorporate a disconnect safety feature that shut down all machine functions if the battery in the transmitter is low or if the effective range has been exceeded. This feature is designed to protect the equipment from damage.

Since wireless remote control systems operate over the airwaves, it is possible for them to cause unwanted interference with other electronic or electrical devices in the work area. Wireless devices can also receive unwanted signals from other remote control systems that may cause undesired equipment operation.

2.1. Operating tips for wireless remote control systems:
- 2.1.1. Make sure that wireless devices are allowed to be used on the job site. Some job sites like hospitals may ban or oversee their use.
- 2.1.2. Check battery condition of transmitter and charge if needed.
- 2.1.3. Know the range of the transmitter and stay within this range.
- 2.1.4. Maintain visual contact with the cutting equipment at all times while in operation.
- 2.1.5. Protect work area from entry of unauthorized personnel.

3. Hydraulic Remote Controls

Hydraulic remote controls need no wires or electricity to operate. Typically, they are miniature valve stations connected by hoses routed back to a main hydraulic pump. These stations contain lever- or rotary-actuated valves that control the hydraulic fluid to the equipment being operated. Hydraulic remotes provide individual control functions such as power travel, power arm and blade rotation at distances up to 100 feet from the power unit. These mini stations are most commonly used when there are only limited control (i.e.; blade rotation only) functions from the power unit itself.

3.1. Operating tips:
- 3.1.1. Inspect all hoses and fittings and repair if needed.
- 3.1.2. Keep fittings clean of dirt and concrete grit.
- 3.1.3. Keep a container on hand in case of an oil leak.
- 3.1.4. Maintain visual contact with the cutting equipment at all times while in operation.
- 3.1.5. Protect work area from entry of unauthorized personnel.

4. Pneumatic Remote Controls

These controls are similar to the hydraulic remote systems in that hoses are needed between the “remote” and the equipment to be controlled. An air compressor is needed to provide the air to operate the equipment. The compressor must be sized so that the equipment being used receives the correct volume of air (CFM/Cubic Feet per Minute) and the correct air pressure (PSI/Pounds per Square Inch). Check with the equipment manufacturer for specifications and air requirements.

4.1. Operating tips:
- 4.1.1. Inspect all hoses and fittings and repair if needed.
- 4.1.2. Keep fittings clean of dirt and concrete grit.
- 4.1.3. Maintain visual contact with the cutting equipment at all times while in operation.
- 4.1.4. Protect work area from entry of unauthorized personnel.

5. General Safety Tips

- Always wear the appropriate PPE for the job conditions.
- Follow all OSHA rules and regulations.
- Never leave any piece of equipment that is in operation unattended.
- Stay alert and anticipate potential unsafe hazards.