

Key Issues and Considerations when for Working around Concrete Pumps, Concrete Pump Trucks, and Crane Lift Buckets



INTRODUCTION

This document is created to highlight issues confronted by members of the ready mixed concrete industry working around, near, or who may interact with concrete pumps, concrete pump trucks, and/or crane lift bucket jobs.

In 2014 The American Society of Mechanical Engineers (ASME) published ASME B30.27-2014 (a revision of ASME B30.27-2009) *Material Placement Systems: Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings*. In the 2014 revision, there are several changes that have the potential to significantly increase the liabilities for the ready-mix concrete industry and its employees. This document is meant to help provide information on how to potentially address those issues.

No distinction has been made between front discharge ready-mix trucks, rear discharge ready-mix trucks, or volumetric concrete trucks. This information is intended to apply to all equally.

This document is intended to inform members of the ready mixed concrete industry about the hazards found around concrete pumps, concrete pump trucks, crane buckets, and cranes that are commonly found within the concrete industry. This document is intended to identify issues, including safety hazards, that are associated with this equipment. It is important for members of the ready-mix concrete industry to be familiar with safety guidelines that apply to the operation of this type of equipment.

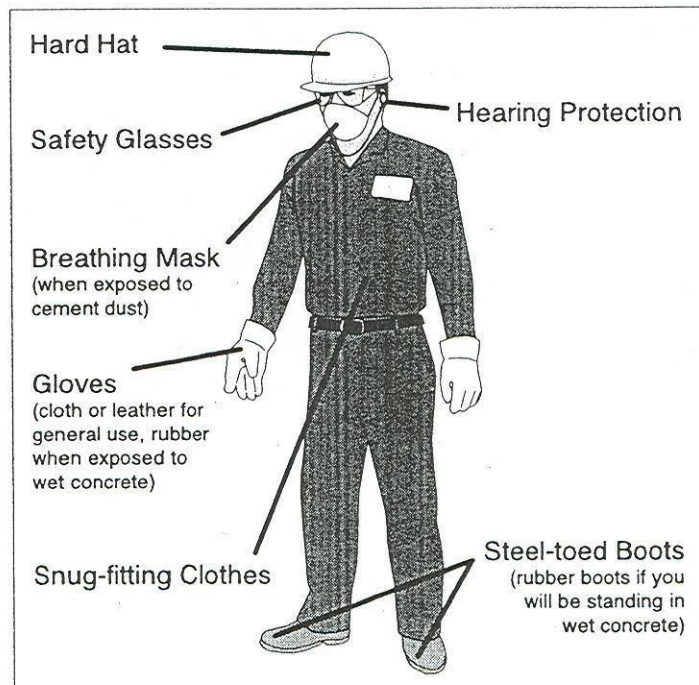
No attempt has been made to list all possible ways in which a member of the concrete industry could be injured around concrete pumps, concrete pump trucks, and/or crane lift buckets. It is assumed that members of the ready-mix concrete industry will use their own self-awareness, and sound judgment to work and operate safely.

DISCLAIMER: Some of the material used in this document was obtained from the American Concrete Pumping Association. Refer to your company's specific policies, procedures and rules regarding the delivery of concrete to a concrete pump, concrete pump truck or crane assisted bucket. This document is only meant to provide information; it is not a safety guideline or standard.

Published in June 2015 by the Texas Aggregates and Concrete Association, 900 Congress Ave, Austin, Texas 78701

1. General

1.1 WARNING! Concrete industry professionals should wear Personal Protective Equipment (PPE) when working near a concrete pump, concrete pump truck, or crane bucket. Proper equipment includes but is not limited to safety glasses, steel toe boots, hard hat, ear protection, and rubber gloves. These items are especially important when working near the hopper or bucket. There may be additional PPE requirements by your company or at the delivery location.



1.2 WARNING! ELECTROCUTION HAZARD! If the concrete pump, concrete pump truck, or crane bucket becomes energized, the electricity will travel through the concrete going in to the hopper and energize the ready-mix delivery vehicle. If you are touching the ready-mix delivery vehicle, the concrete pump, concrete pump truck, or crane bucket, when that happens you could be electrocuted. Make sure to monitor the boom movements of the concrete pump truck. If you perceive a problem, immediately cease discharge of concrete into the pump hopper or crane bucket and pull the concrete delivery vehicle away from the concrete pump, concrete pump truck, or crane bucket and immediately alert the operator.

At no time should any part of a concrete pump, concrete pump truck, or crane bucket (and including the actual crane) become closer than 17 feet of energized power sources. **(Company policy may dictate additional distance from an energized power source. Refer to your company's safety rules or policy manual.)**

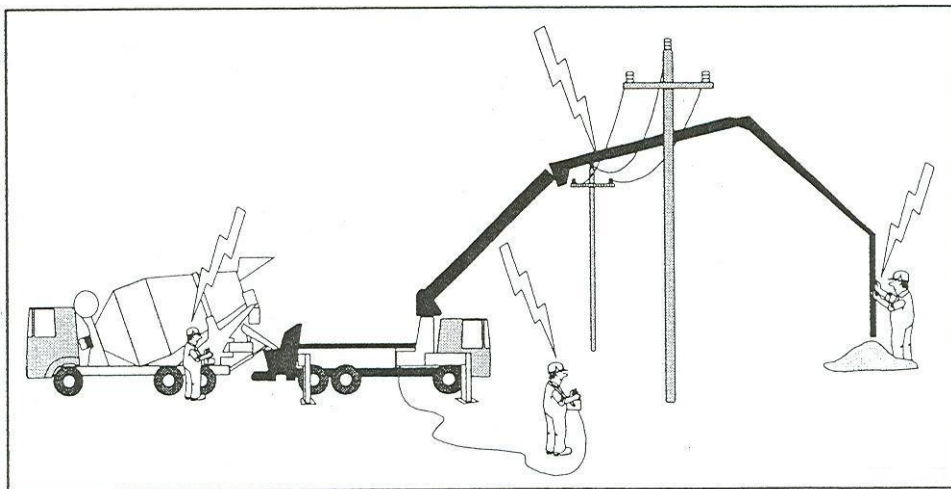
If concrete pumps, concrete pump trucks or the crane bucket (and including the actual crane) become energized and someone is being electrocuted, **NEVER** make contact with that person. Do not stand in the concrete or make contact with any steel or equipment on the job unless you are **POSITIVE** the power has been turned off with your own LOCK OUT/TAG OUT lock! You could be electrocuted, too! Although it will be hard to do, leave the rescue effort to trained experts.

Some high voltage power lines have circuit breakers that may stop the flow of electricity for a short time and then become energized again. You could be electrocuted by standing in wet concrete or by making contact with steel or equipment being used on the job.

If the concrete pump, concrete pump truck, or crane bucket (or actual crane) comes in contact with energized power lines and you are not in or on the concrete delivery vehicle, **DO NOT COME IN CONTACT WITH THE CONCRETE DELIVERY VEHICLE.** Do not attempt to move the concrete delivery vehicle.

If you are in or on the concrete delivery vehicle and the concrete pump, concrete pump truck, or crane bucket (or actual crane) comes into contact with energized power lines and there is no fire or feeling of electricity, stay put! If there is a fire and you have to exit the concrete delivery vehicle, jump and roll as far away from the concrete delivery vehicle as possible.

NEVER MAKE CONTACT WITH the concrete delivery vehicle AND GROUND AT THE SAME TIME!

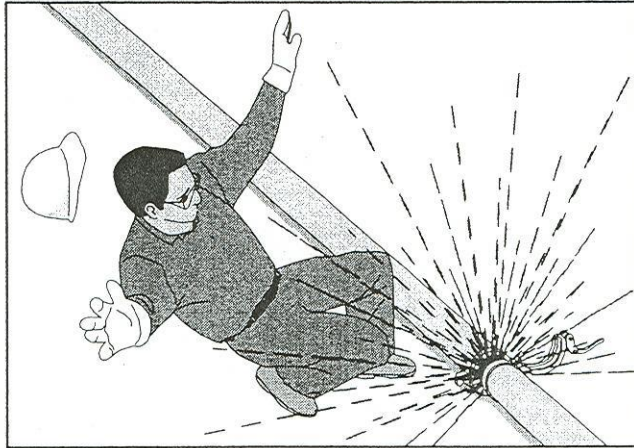


1.3 WARNING! LIGHTNING, ELECTROCUTION HAZARD! Although electrocution due to lightning is rare, lightning should be monitored if in the area. If you feel the risk of a lightning strike, notify the operator that you will be in the cab of the concrete delivery vehicle until the threat has subsided.

1.4 WARNING! FALLING HAZARD. Concrete industry professionals should not stand on a concrete pipeline or walk across the pipeline while in use. Concrete pumps or concrete pump trucks can develop pipeline pressures greater than 1000 PSI! Pipelines can move without warning.



1.5 WARNING! PROJECTILE HAZARD. Concrete industry professionals should stay away when the pipeline is being opened. If pressure remains when the pipeline is opened or if the clamp/pipe breaks, concrete will be ejected with dangerous velocity. The operator of the concrete pump or concrete pump truck is responsible for knowing how to safely remove pressure from the line. You must wear your personal protective equipment near a pipeline.

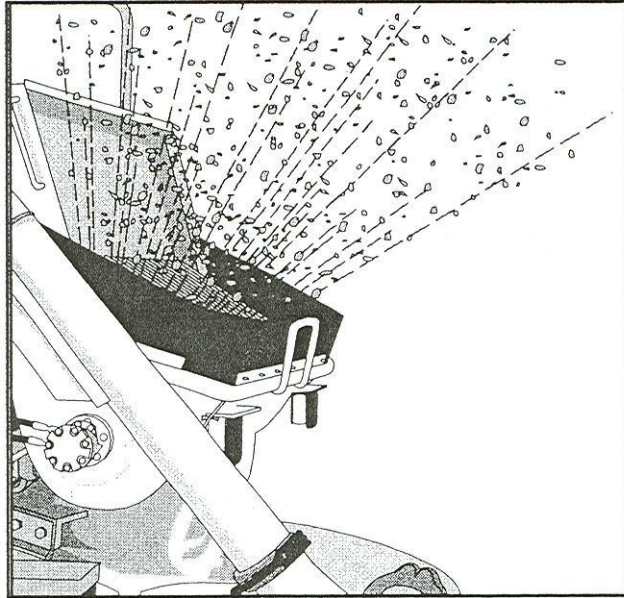


1.6 WARNING! PROJECTILE HAZARD. Concrete industry professionals delivering the ready-mix to the job site should not touch any concrete pump or concrete pump truck pipe clamps or hoses. Alert the operator immediately if you see a problem!

1.7 WARNING! FALLING HAZARD. Use the “three point rule” when getting on or off concrete pump or concrete pump truck. [NOTE: Access to the pump or pump truck should only be permitted by an authorized representative of the pump or pump truck operator.] The three point rule means that the person must have one hand and two feet or two hands and one foot in contact with a secure surface at all times. Avoid getting on concrete pump or concrete pump truck unless it is absolutely necessary.



1.8 WARNING! PROJECTILE HAZARD. Always wear safety glasses before looking in the hopper. Keep your distance when monitoring the hopper. Never look into the end of a connected pipe or hose.



2. Arriving at the Jobsite

- 2.1 **BE SEEN! A safe jobsite depends on others knowing your location.** Ensure concrete pump, concrete pump truck, or crane bucket operator knows that you are on site.
- 2.2 Look up and all around for electrical lines or power cables that may be or become closer than 17 feet of the concrete pump truck boom or crane and the cable while in operation. (Company policy may dictate additional distance from an energized source. Refer to your Company's rules and policy manual.)
- 2.3 If delivering at night, make sure to have proper lighting. If not, take additional precautions.
- 2.4 Let other equipment operators know where you are located.
- 2.5 Make sure all mirrors are clean and properly adjusted before backing up to pump.
- 2.6 Always use a spotter when approaching the pump or crane.
- 2.7 Inspect the route from the road to the pump or crane.
- 2.8 The route must allow a clear view of the pump hopper or crane.

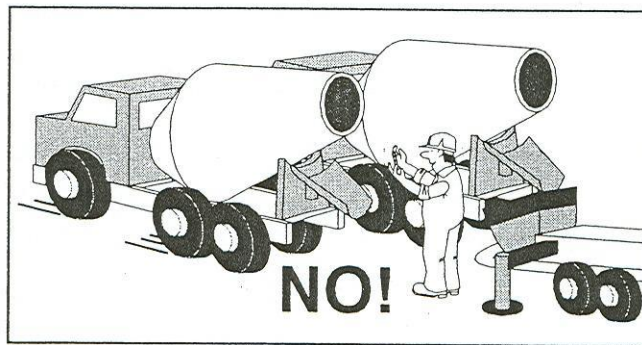
2.9 You must be able to see the equipment or spotter as you get close to the pump.

2.10 Identify if more than one concrete delivery vehicle will be discharging into the concrete pump hopper, concrete pump truck hopper, or crane bucket.

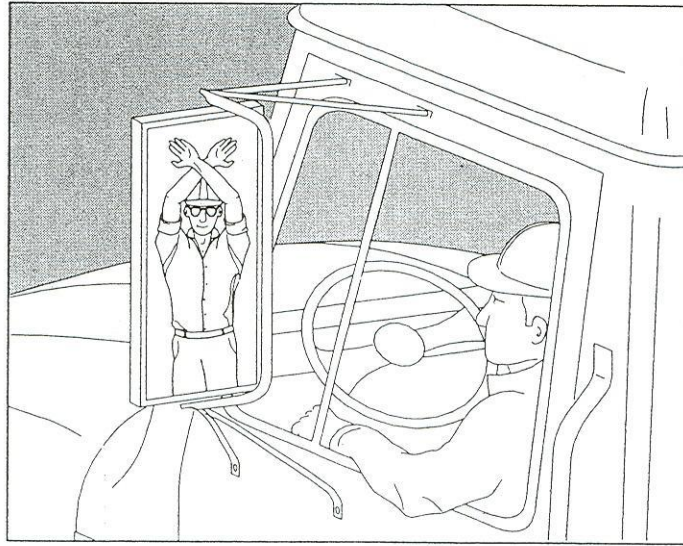
2.11 Make sure the outriggers of the concrete pump, concrete pump truck, crane are stable and can be seen.

3. Approaching the Concrete Pump, Concrete Pump Truck or Crane Bucket

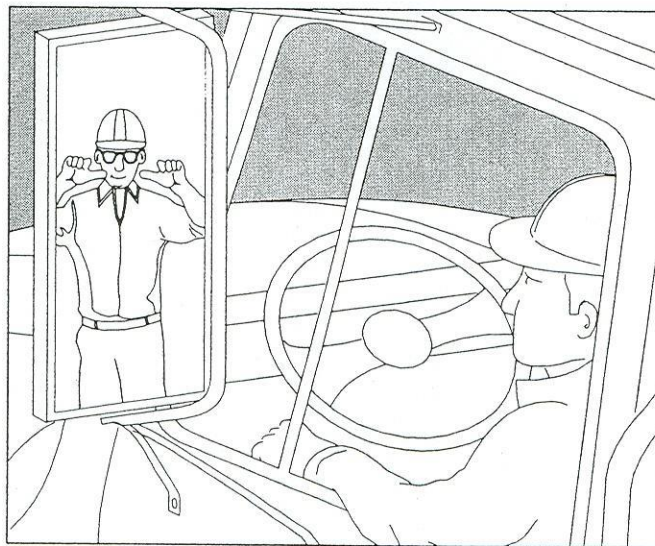
3.1 WARNING! CRUSHING HAZARD. NEVER get between a concrete pump, concrete pump trucks, and/or crane lift bucket and a ready-mix concrete delivery vehicle. Never let anyone else stand between the concrete pump, concrete pump trucks, and/or crane lift bucket and a ready-mix concrete delivery vehicle. If more than one ready-mix concrete delivery vehicle is delivering to the concrete pump hopper, concrete pump truck hopper, and/or crane lift bucket, make sure no one is trapped between the ready-mix concrete delivery vehicles or between the ready-mix concrete delivery vehicle and the concrete pump, concrete pump trucks, and/or crane lift bucket before you begin backing towards the concrete pump, concrete pump trucks, and/or crane lift bucket.



3.2 WARNING! CRUSHING HAZARD. Do not get closer than 10 feet to the concrete pump, concrete pump trucks, and/or crane lift bucket unless you have a clear view of the spotter who is directing you. If you lose sight of the spotter, stop immediately. Do not continue to back up until line-of-sight has been re-established.



3.3 WARNING! CRUSHING HAZARD. When backing towards the concrete pump, concrete pump trucks, and/or crane lift bucket, the spotter must use clear and concise hand signals. Agree on hand signals before you begin the back.



3.4 WARNING! CRUSHING HAZARD. If you find yourself acting as the spotter for another concrete delivery vehicle, make sure the driver of the concrete delivery vehicle is watching you. Make sure you're not in the path of the concrete delivery vehicle as it backs towards the hopper.

If the driver is not safely approaching the concrete pump, concrete pump trucks, and/or crane lift bucket, immediately signal the driver to stop. When stopped, agree on hand signals and any other factors or conditions that would affect a safe approach to the concrete pump, concrete pump trucks, and/or crane lift bucket.

3.5 WARNING! CRUSHING HAZARD. Take direction from only one spotter. Do not attempt to use both rearview mirrors as you near the concrete pump, concrete pump trucks, and/or crane lift bucket. Taking your eyes off the spotter for even a moment could lead to an accident.

3.6 WARNING! CRUSHING AND AMPUTATION HAZARD. Do not allow anyone to move, raise, lower, operate, adjust, or unfold the discharge chute while backing towards the concrete pump, concrete pump trucks, and/or crane lift bucket. Stop immediately if someone tries to make a chute adjustment.

3.7 WARNING! CRUSHING HAZARD. Know the condition of your brakes. Approach the concrete pump hopper, concrete pump truck hopper, and/or crane lift bucket at a speed that allows you to stop immediately. Set the parking brake before leaving the cab. Be sure the transmission is in neutral. Trucks with automatic transmissions can move suddenly if the engine RPM is increased and the transmission is not in neutral.

3.8 WARNING! CRUSHING HAZARD. Loaded and unloaded crane buckets can swing unexpectedly and crush individuals in pinch points. Never attempt to grab a swinging crane bucket!

3.9 WARNING! EQUIPMENT MALFUNCTION HAZARD. If your ready-mix concrete delivery vehicle hits any part of the concrete pump, concrete pump truck, and/or crane lift bucket, report the damage to the operator and your company immediately. Even seemingly small damage can cause an unsafe operating condition and could endanger everyone on the jobsite.

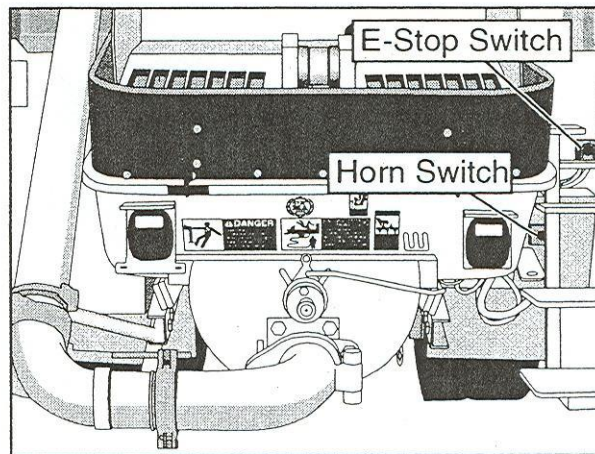
4. Delivering the Concrete

4.1 WARNING! PLUGGING HAZARD. Do not put concrete into the concrete pump hopper, concrete pump truck hopper, and/or crane lift bucket until the operator directs you to do so. If the concrete pump or concrete pump truck has not been primed, filling the hopper can cause the concrete pump or concrete pump truck to plug. Plugs create a hazard because they cause the concrete pump or concrete pump truck to reach maximum pressure.

4.2 WARNING! PLUGGING HAZARD. Foreign material can cause blockages. If you see foreign material coming from the concrete delivery vehicle or any other source, immediately stop concrete discharge from the concrete delivery vehicle and signal the operator to stop the concrete pump or concrete pump truck. If you cannot get the operator's attention, hit the emergency stop switch. Do not allow the concrete chute rake or any other item to fall into the hopper. Do not

attempt to grab foreign objects from the hopper while it is operating. Even if stopped, the concrete pump or concrete pump truck is remote controlled and can start at any time. Alert the operator to stop the concrete pump or concrete pump truck if you must remove foreign material from the hopper.

4.3 WARNING! HOSE WHIPPING AND OTHER HAZARDS. You must know how to stop the concrete pump or concrete pump truck in an emergency. Have the operator show you the locations of the emergency stop switches and how they work. If an emergency arises, hit the emergency stop switch. Tell the operator about the problem after hitting the switch.

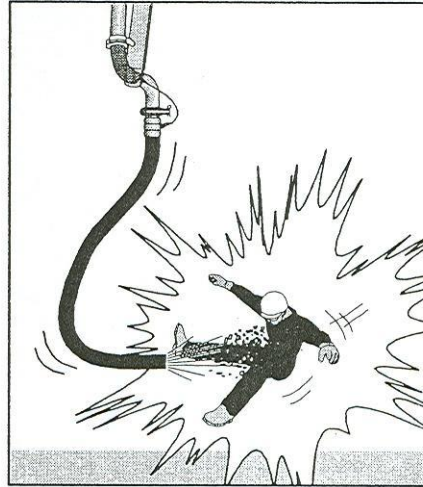
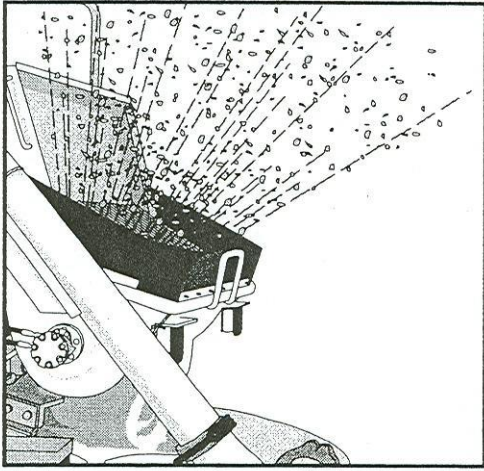


4.4 WARNING! HOSE WHIPPING AND OTHER HAZARDS. Know how to signal the concrete pump or concrete pump truck operator to stop the concrete pump or concrete pump truck if you can't keep enough concrete in the hopper. Some concrete pump or concrete pump truck are equipped with horn buttons on the rear of the concrete pump or concrete pump truck. Use the emergency stop switch only if you can't get the operator's attention. A restarting procedure is required after hitting the emergency stop that may cause delays. In spite of the restarting procedure, do not hesitate to use the emergency stop if the need arises.

4.5 WARNING! HOSE WHIPPING AND OTHER HAZARDS. Keep the hopper about two-thirds full. Do not let the material level in the hopper become so low that air is sucked into the material cylinders of the concrete pump or concrete pump truck. If air is sucked into the cylinders, the concrete pump or concrete pump truck will compress the air. Compressed air always poses a hazard as it is released from the concrete pump or concrete pump truck or the delivery pipeline. Before air is sucked into the cylinders, signal the operator to stop the concrete pump or concrete pump truck. Some concrete pump or concrete pump truck are equipped with switches which will stop the concrete pump or concrete pump truck without using the emergency stop. In that case, the operator would be able to show you what to do.

4.6 WARNING! HOSE WHIPPING AND OTHER HAZARDS. If air is sucked into the

cylinders, the concrete pump or concrete pump truck must be stopped regardless of how it happened, as this can occur regardless of whether the hopper is continuously full with concrete. If you cannot get the operator's attention, hit the emergency stop switch. It is the operator's job to know how to safely remove air from the concrete pump or concrete pump truck and delivery system. Do not refill the hopper unless directed to do so by the concrete pump or concrete pump truck operator. Stand away from the hopper and the end hose until the operator has removed the trapped air from the delivery system and has signaled you that it is safe to begin unloading again.



4.7 WARNING! HOSE WHIPPING HAZARD. Stay away from the end hose of the concrete pump or concrete pump truck. This is especially important to remember when the material is being placed close to the concrete delivery vehicle. The tip of the hose may move quickly and unexpectedly. If the hose is kinked, it could unkink violently.

4.8 WARNING! CRUSHING AND AMPUTATION HAZARD. Do not stand on the hopper grate.

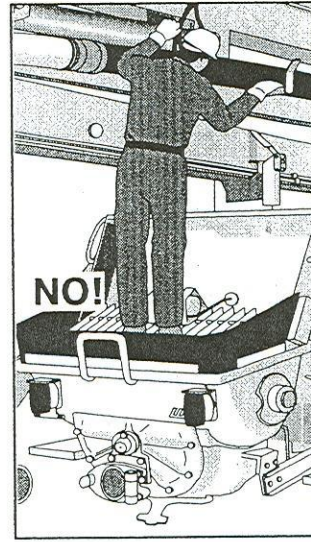
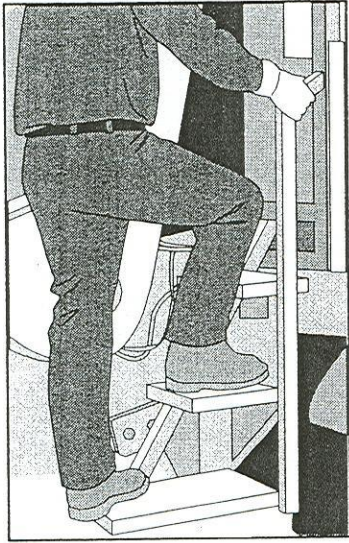


4.9 WARNING! PROJECTILE HAZARD. Avoid walking under the boom of concrete pumps or concrete pump trucks. Avoid standing next to the elbow at the back of the concrete pump or concrete pump truck.

4.10 WARNING! HEAD INJURY HAZARD. Avoid walking under the outriggers of the concrete pump or concrete pump truck.

4.11 WARNING! TRIPPING HAZARD. Try to avoid overfilling the hopper to the point where concrete piles up on the ground. As the concrete dries, it creates a tripping hazard near moving machine parts.

4.12 WARNING! TRIPPING AND FALLING HAZARD. Avoid getting on the concrete pump or concrete pump truck at all. Do not stand on the concrete pump or concrete pump truck because you could lose your balance near moving machine parts.

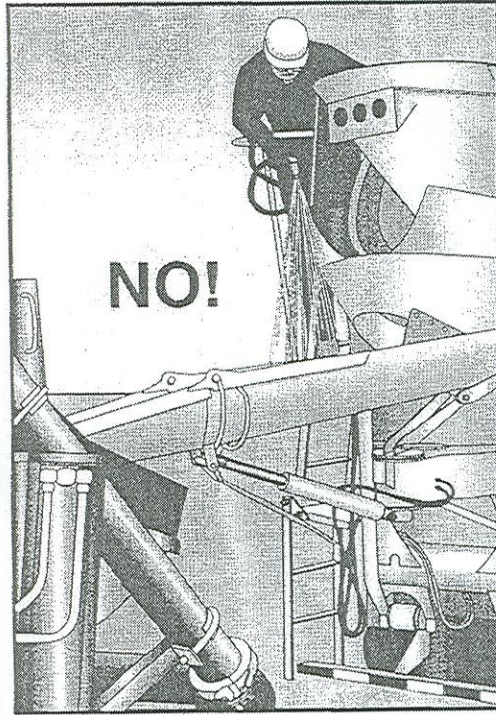


4.13 Only one person operates the concrete pump or concrete pump truck. The concrete pump or concrete pump truck operator is responsible for the safe operation of the concrete pump or concrete pump truck and boom. If you have questions regarding correct or safe pumping procedures, talk to the operator. Different operators may have different procedures. If in doubt, ask.

4.14 Safety is always in the hands of the people on the job. Monitor the movements of the boom at all times even if no electric wires are present.

5. Cleaning and Departing the Jobsite

5.1 WARNING! PLUGGING HAZARD. Do not wash the concrete delivery vehicle out into the concrete pump hopper, concrete pump truck hopper, or crane bucket. Water washes the cement and fine aggregate out of the mix leaving a coarse mixture that cannot be pumped nor placed.



5.2 WARNING! HOSE WHIPPING AND PROJECTILE HAZARD. At the end of the job, the operator may want the level of material in the hopper to be lower than usual. In spite of this, do not allow the level to become so low that air is sucked into the material cylinders.

5.3 WARNING! COLLISION HAZARD. Do not drive under the boom of the concrete pump or concrete pump truck when pulling away from the job. Ask the operator to move the boom to a safe area. If the operator will not move the boom, take a different route off the jobsite.

5.4 WARNING! VARIOUS HAZARDS. Do not allow the operator to pump concrete back into the ready-mix concrete delivery vehicle.

5.5 WARNING! HOSE WHIPPING AND PROJECTILE HAZARD. Make sure the operator knows that you are empty and leaving. Be friendly. Before leaving, allow the concrete pump or concrete pump truck operator to have some spare water if needed.

5.6 WARNING! CRUSHING HAZARD. Before leaving the job site, inspect the area for a safe exit.