

# ACPA SAFETY BULLETIN

## CLEAN OUT PROCEDURES

### Plan Ahead

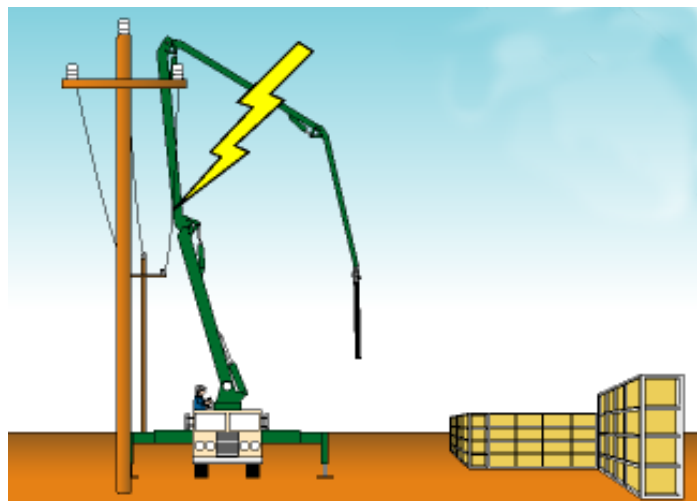
Know where you need to clean out; and if you have to move, survey the location using the same considerations you would if you were preparing for a pour. Anticipate the cleanout and get everything ready that you can. If you are required to clean out with air, make sure you have all the necessary accessories. Suck a sponge through the boom before folding up and moving to the cleanout area. The elements required for a hose-whipping incident are all in place when a sponge is sucked into a boom, so use extreme caution when pumping the ball out.



Accidents could occur if the move is started before the boom and outriggers are secure, if you ignore safe procedures at the cleanout site because you are in a hurry, or if the delay of moving prevents the sponge from coming back.

### Cleaning the Unit

When you are cleaning the unit, watch for electrical wires if the boom must be moved. Suck a ball through the boom, if at all possible. If it is not possible, remember cleaning with water is safer than using air. If you use compressed air, *you must be trained in the proper procedures.*



Never use air to blow through rubber hose or short sections of pipe under forty feet. Short sections of pipe will not have sufficient mass to allow the concrete to move slowly so there will be rapid expulsion of the material. In the case of rubber hoses, their flexibility will allow them to “whip” wildly with the force of the air and moving concrete.

Never remove a clamp before all the pressure is removed from the pipeline. And, never beat on a pipe with a hammer; it will dent and the pipe will wear out at the dent.

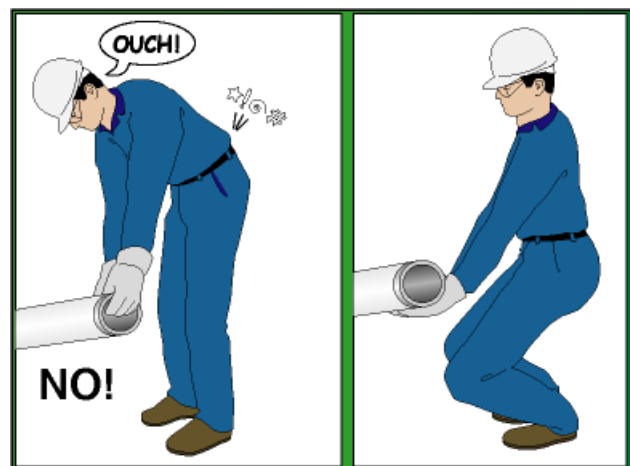


If there is limited water on the job, you can remove the pipe sections individually and rinse them with water. This method takes much less water. You will need help to get the pipe clean before it sets up so arrange for help before the pour is finished. However, this method is not recommended for long runs or vertical pipelines.



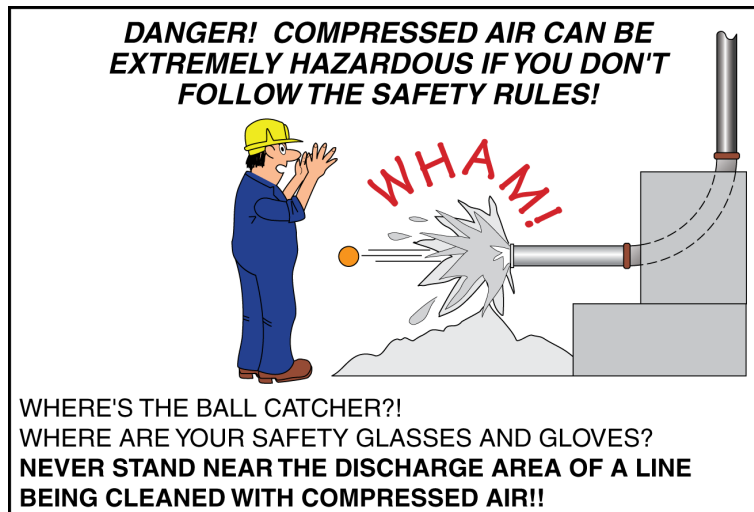
A cubic foot of standard concrete weighs 150 pounds; a ten-foot section of five-inch pipe filled with concrete weighs 310 pounds—110 pounds for the pipe and 200 pounds for the concrete.

To avoid a back injury always lift with your legs and not your back!

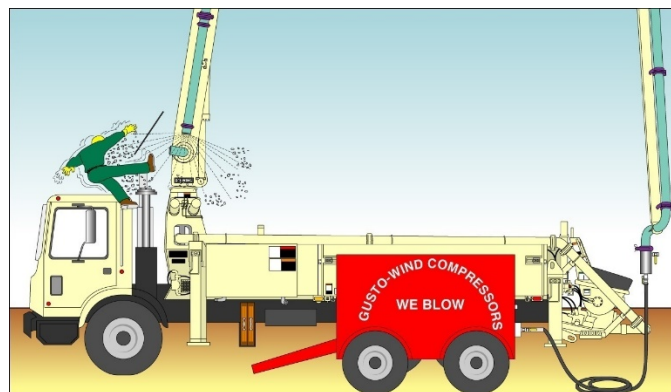


## Cleaning a Separately Laid Pipeline

When cleaning a separately laid pipeline, remember compressed air is dangerous and creates potential hazards. Serious injury or even death can occur if you do not adhere to specific safety points. Special accessories and special training are required. You must also have an adequately rated air compressor.



Never try to remove a blockage with compressed air. Remember, the pump can produce over 1,200 PSI on the material while an air compressor generates only 150 PSI. So, if the pump can't push it, air never will. The primary difference is that air is compressible while concrete is not; which creates the potential for a very dangerous release of energy.

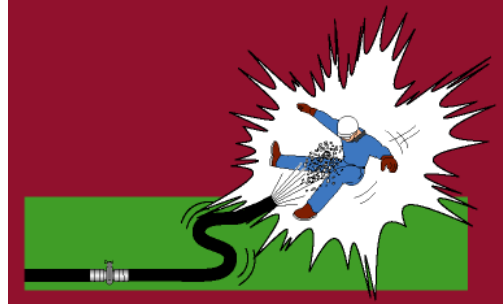


## Cleaning with Compressed Air

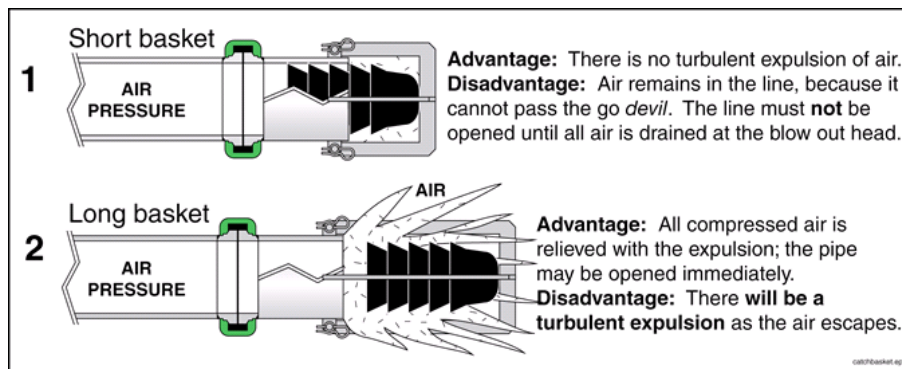
Cleaning with compressed air should *only be done when no other method is practical* and then only under the supervision of a qualified person. This procedure requires two trained persons;

one trained person to administer the air and another on the opposite end to monitor the discharge point.

No hoses or unsecured pipe bends may be connected to the pipeline when blowing out—this is deadly serious. From the time you're ready to turn on the air until all air is removed from the pipeline, the discharge area must be clear of all personnel. Do not allow anyone to enter the area for any reason.



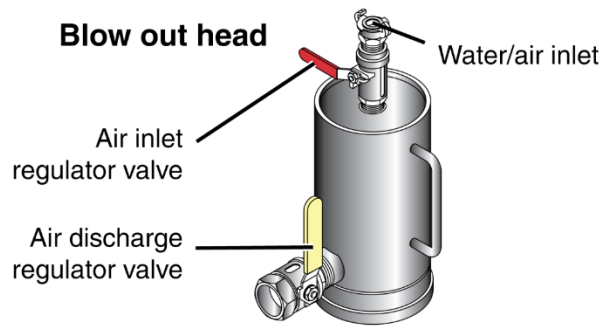
### The Outlet Must be Controlled!



The outlet must be controlled when blowing out with air. The discharge end must be routed to a safe location such as inside a ready mix drum or a crane bucket. A catch basket should be used when possible, and the end should always be properly secured. Select the correct catch basket for your method. The example shows two different types of catch baskets. With catcher type one, the go-devil stops, but air is still trapped behind it. The advantage is prevention of the sometimes violent expulsion of air at the end of the pipe. The disadvantage is the air must be drained from the blowout head before the pipe line is safe to open. The pipeline must be controlled; allow no one to open it until all compressed air is relieved as it could cause serious injury. Catcher type two is long enough that the compressed air escapes behind the go-devil so when the plug reaches the end, all the air is expelled from the pipeline. The advantage of this type is once the go-devil is expelled, there is no pressurized air remaining in the line, and the line may be opened immediately. The disadvantage is the turbulent expulsion itself. You should always cover the discharge with reinforced poly or other durable protective blankets or shields and keep all personnel a safe distance away due to the potential for flying concrete and aggregate. Both types of catchers can be safely used if care is given to the hazards involved. Both the catch basket and outlet must be elevated enough so they will be clear of the concrete discharge pile when you are done.

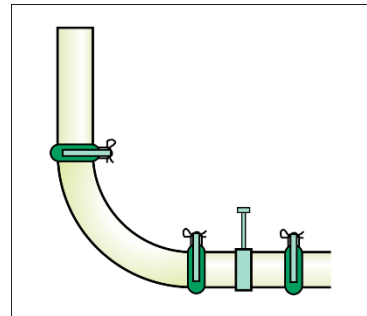
The air blowout head must have an air regulator valve for air inlet as well as one for air discharge. The two openings must be far enough apart that if the ball were to move backward, it couldn't block them both at once. Make sure no one disassembles the pipeline until the air is out and pressure has been relieved. This is extremely dangerous.

Do not blow out short sections of pipe less than forty feet. When you are blowing out the pipe, you will see the air pressure begin to fall; this means the concrete is accelerating. Shut off the air as soon as the pressure begins to drop and bleed air from the pipeline to slow down the ball and/or plug as it is discharged.

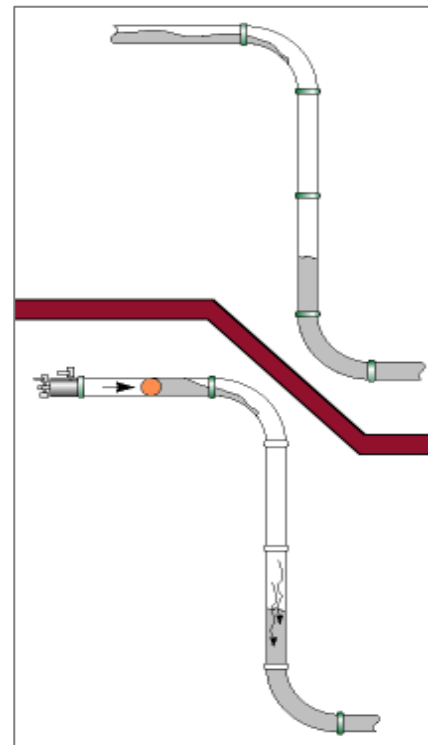


### Cleaning a Vertical Pipeline

When cleaning a vertical pipeline, you must observe the same rules for cleaning a horizontal pipeline, plus a shut-off valve must be used at the bottom of the vertical run. There are many types of shut-off valves; this is just one example.



Why is a shut-off valve needed? If the pipe is disconnected from the pump before the ball and cleanout head are installed, gravity forces much of the concrete out of the vertical sections resulting in pockets of air. When the ball is inserted and air pressure is introduced, the air pockets trapped in the pipe will compress. This is an extreme safety hazard because the air cannot be captured by the ball catcher and expulsion can be excessive. In addition, segregation may occur and cause a rock jam.



Here is the procedure for cleaning out a vertical pipeline:

First, close the shut-off valve so the concrete will not be allowed to free fall (A). At the top of the line, insert the ball and secure the blowout head, but do not turn on the air yet (B).

At the bottom end (C), disconnect the pump, unless using a diversion valve; divert the building line to the discharge locations such as the ready mix drum or wherever you are going to put the concrete from the line (D).

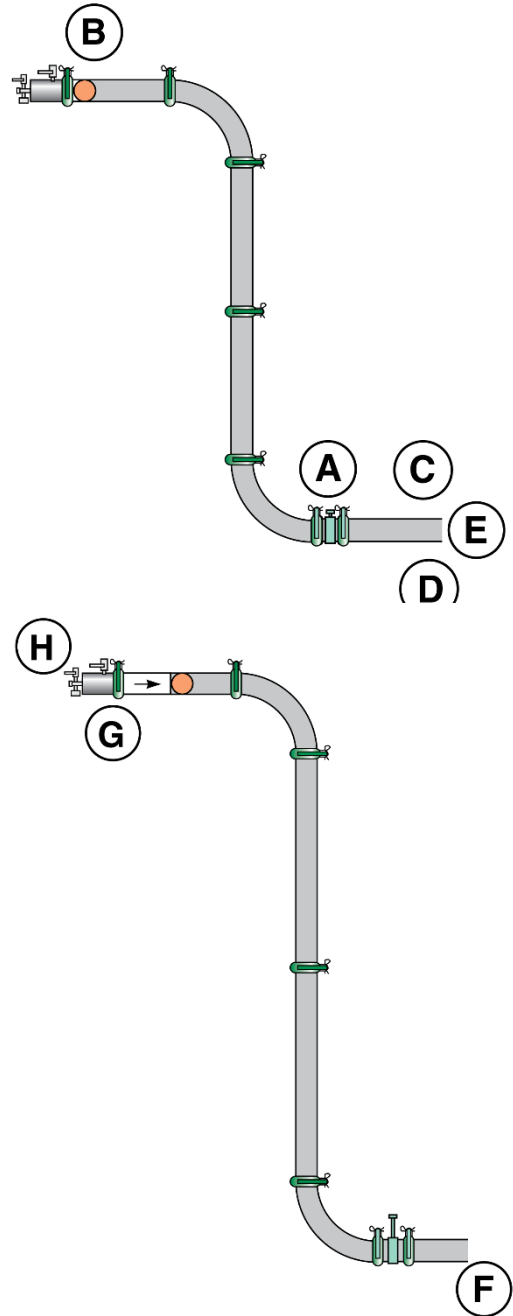
Install the ball catcher and lubricate the discharge line (E). In some cases you may have a diversion valve, while in others you may simply be attaching a goose-neck pipe to the existing line.

After you have routed and secured the discharge line from moving, clear the discharge area of personnel (F).

Open the shut-off valve and allow gravity to start the concrete flowing (G).

Turn on the air using only enough to keep the concrete moving at a steady pace (H).

As soon as the concrete begins to accelerate in the pipeline (indicated by falling pressure), turn off the air and begin to bleed off the air pressure.



### Summary

Cleanout with compressed air requires two trained people and will get easier with experience. Cleanout can be one of the most hazardous jobs of a pump operator so you should never take it for granted, and always assume no one else knows the safety rules.